
Do (not) blame the price

A quantitative analysis of the different determinants of museum demand

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Summary

The subject of this master thesis refers to discussion about free entrance to museums. Politicians tend to give price a heroic role in the field of art and culture, but the question is if the desired increase in demand is attributable to the price only. The question to be answered in this thesis is as follows.

'What is the price elasticity of museum demand, what other factors influence this demand and are there any differences to observe between the different types of museums?'

This thesis is split up in two parts; a theoretical framework, which is covered by chapter two to five and a research framework. The first chapter is an introductory chapter wherein some background information is given about the Dutch policy in the realm of arts and culture and museums in particular.

Theory

In the first theoretical chapter, chapter two, the economics of museums is discussed. Just like in other fields of economics, museum services create supply and demand. Museum demand is determined by both economic factors, such as price, and social factors like education and environment. Besides private demand museums also generate social demand, like option values and bequest values. The supply side of museums deals with the different functions a museum encompasses. A museum faces a specific cost structure in which the fixed costs are high and the marginal costs are low. This results in diminishing average costs curve. To cover the total costs museums often receive subsidy. Because of this subsidy admission charges are low. These low admission charges should attract a wide audience. Frey and Meier, and with them many others, argue that more factors besides price influence museum demand.

In chapter three other determinants of demand are discussed. This chapter deals with the consumer theory. This theory states that the package of goods and services consumers acquire should fit their personal utilities as best as possible, so people can reach the highest feasible level of satisfaction. A consumer faces a process of maximising the utility function, which results in a system of relations wherein the demand for goods and services depends on taste, income, and prices. Whether a consumer will visit a museum thus does not rely on the price only, but the price should also meet the budget (income) of the consumer and the museum's collection should fit his or her taste.

Chapter four focuses on how consumers behave if the price for a good changes. In this chapter the price elasticity of demand is discussed. The price elasticity reflects the change in quantity demanded if the price for a good changes. In arts and culture several studies on price elasticity of demand are done, but only a few focus on the price

elasticity of museum demand. Those surveys have mainly the same conclusion; a change in price does not affect the number of visits radically. The price elasticity of demand for museums is inelastic in the short-run as well as in the long-run. This is caused by three main details. At first museums are often visited by tourists who are not sensitive to price changes. Besides that, tourists have other costs, which cover the most part of their total costs. Also for other visitors the entrance fee is just a small fraction of the total costs that visitors have. An increase in entrance fees thus has not a large effect off the total costs. Secondly, an increase in price gives a museum more financial resources to enhance the quality. Since quality and visitors numbers seems to be positively associated, an enhancement in quality will result in more visitors. Lastly, the price elasticity of demand for museums is low for the reason that museum visitors are often art patrons who visit the museum anyway.

The last theoretical chapter discusses more socio-economic determinants of demand. According to sociologists five factors influences the choice to visit a museums. The price of the ticket and the income of the consumers play a role, but next to these economic determinants more social determinants play a role as well. One of them is education and upbringing. The higher the level of education and the more cultural orientated his upbringing is, the more likely the consumer will visit a museum. Besides that available time seems to play a role, however this aspects is more important when visiting the performing arts. At last the social environment of a consumer influences the consumer in his consumption pattern.

Empirical study

The empirical study is divided in two parts. In the first part the development of prices and demand for museums is analysed and the price elasticity is estimated. The price of an entrance ticket for museums shows a large increase between 1983 and 2003. In spite of this the visits did not decline dramatically. In comparison with 1983 there is even an increase in visits, but it is the case that there is a decline in visits since 1993. This small effect results in a short-term elasticity of 0.24 and the long-term elasticity of 0.52, which is in line with the theory. Both elasticities thus are inelastic. It was the intention to also estimate the price elasticity of visual art museums. Due to insufficient data this was not completed. Data concerning demand for visual art museums were available; the data shows a different development of visits than for museums in general. Demand for visual art museums does increase faster. Data about the entrance fee was available for a couple of years, but the prices are estimated for the missing years. The development of the entrance fee shows the same pattern as for museums in general and thus the analysis of price and demand indicates that the public of visual art museums is less

sensitive to price changes than museum visitors in general are. However no concrete assumptions can be made since this analysis is based on interpolated data.

In the second part a discriminant analysis is applied to predict which factors, besides price, determine to the greatest extent whether a consumer will visit a museum. Within this analysis a distinction is made between visual art museums and other types of museums. The socio-economic determinants presented in chapter five are discussed in this chapter. The univariate analysis shows that museum visitors have a higher income, a higher education level, and a higher participation rate in cultural activities than non visitors. Visitors of visual art museums score higher on these factors than visitors of other types of museums. The discriminant analysis of museum visitors and non visitors shows that the factor education and upbringing is the most important factor that influences demand. Next to this determinant social environment plays an important role. The discriminant analysis for visual art museum visitors and visitors of other types of museums shows almost the same results. However the values are more discriminating for museum visitors in general than for visitors of visual art museums. One factor is more distinctive for visitors of visual art museums, namely available time. This factor does not play an important role for museum visitors in general.

Conclusion

The conclusion starts with summarising the outcomes of the hypotheses. Hypothesis three, which relate to the price elasticity of visual art museum demand, is the only one that cannot be verified or falsified. The other hypotheses are verified. After repeating the results of the hypothesis the central research question is answered. A summarised answer to the research question is that the price elasticity of museum demand is both in the short-run as in the long-run inelastic. Next to the price education and upbringing and social environment are important determinants of demand and the demand for visual art museums is determined in a slightly different way than the demand for other types of museums. Price thus does not play such a heroic role as politicians argue and therefore a free museum policy only would not attract a wider audience. To attract more socio-economic groups other measurements should be taken.

To study this subject further several aspects can be taken into account. Firstly the influence of the index of train tickets and gas can be analysed to see if there is a relation between this cost factor and demand. Also the impact of tourist on the price elasticity of demand can be analysed.

Preface

In February 2006 the discussion about free entrance to museums first caught my attention. A few months later a report about costs and effects of free entrance, written by APE¹, passed by and my interest for the topic increased. I kept the subject in mind, and during my master in Cultural Economics I further developed my interest in the relation between entrance fees and museum visits. The thing that stunned me the most was the fact that politicians argued that free entrance to museums would attract a wider audience. In my opinion this certainly was not the case. Therefore, the goal of this master thesis is to reveal if the price influences the demand for museums to a great extend and whether there are other factors involved.

In March 2007 I started this master thesis about determinants of museum demand in combination with an internship at APE. During the last months this thesis was shaped and refined. I spent several hours in archives to collect the data I needed. Besides that, I also put a lot of energy in studying statistics, learning how to program equations and actually writing this thesis. While writing this, July 2007, the final version of my master thesis is completed and I am able to look back at a valuable and fruitful period of my master year.

During the process of writing this master thesis I got a lot of support from different persons. At first I would like to thank Dr. Langenberg, my supervisor, who gave me a lot of good advice and support. Our monthly meetings were always very pleasant and gave me a lot of new input. Secondly a word of thank is put forward to René Goudriaan and other colleagues of APE, who supported me in applying some basic econometric models and offered me an excellent working environment. I also show my appreciation to Luuk van der Zijden for his support in explaining economic theories and revising the texts, which also counts for Elena Bird who gave me English-grammar support. At last I would like to show gratitude to my parents who financially supported my master year at Erasmus University. Without them I could never have done this.

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¹ Aarts De Jong Wilms Goudriaan Public Economics bv

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1 Introduction

In April 2006 the question of whether or not to charge for museum admission became a hot topic in several Dutch newspapers, prompting a wider discussion about admission charges for the arts. This discussion came at the hest of some political parties whose proposal was founded on the idea that free entrance to museums would attract a wider audience. Since then a new government policy accord of the fourth cabinet of Balkenende has shifted the discussion of museum admission charges from a debate of 'no charge' to a debate about the 'users pay principle' ('profijtbeginsel'). While the discussion continues, the essential question remains the same: does price influence demand for museums² to such a great extent or are there other factors involved? Should price be given such a heroic role in this case? The aim of this master thesis is to investigate this question through an updated research of the determinants of demand for museums. In this introductory chapter an overview of the Dutch museum policies is given to clarify the developments of admission charges and museum financing over the years. Within this historical overview the current debate is analysed. The chapter concludes with a presentation of the research question and thesis outline.

1.1 Museum policies in the Netherlands

Since the late 19th century the Dutch government has invested financial support in its state museums. At first this effort was directed specifically to different collections around the country, but in the beginning of the 20th century a foundation was made to carry out a national museum policy. During these years several new museums were founded and a number of private collections became state-owned. After World War II government intervention in the realm of arts and culture increased substantially and began to play a larger role in providing the public with cultural goods. In 1976 the first national vision on museum policy was published. Within this vision museums were regarded as an instrument to insure the well-being of people. Besides this vision every four years a new policy, the 'Cultuurnota', is written and outlines a strategy for the national cultural policy. This strategy describes the most important focus points of the cultural policy, and gives an overview of the partition of the subsidy for the cultural organisations (Ministry of Education, Culture and Science, 2006:29-46 and 74-79).

During the first part of the nineties the government began to support a more entrepreneurial approach (Ministerie van Onderwijs, Cultuur en Wetenschap, 2005: 1-6). In line with this development seventeen state museums were privatised. However, this

² Demand for museums is in the case of this thesis the demand for museum exhibitions (the actual visit); demand for other museum services will not be discussed.

process of privatising started up earlier. In 1982 the cabinet of Lubbers already did some suggestions to reduce government intervention in all kind of organisations. One measure of this process is the privatising of the state museums. Along with other measurements to gain more efficiency, in 1988 the 'Algemene Rekenkamer' (the National Court of Auditors) reported on the running of state museums. This report has drawn the conclusion that state museums do not operate in the most efficient way and could practise their tasks more efficiently. In line with these conclusions a research is done, which should show the possibilities of privatising the state museums so they could perform their tasks in a more enhanced way and gain more efficiency. In 1990 the first step towards privatisation for six state museums was made. These museums gain more freedom, for instance in hiring staff, and in May 1991 permission is given by the parliament to privatise these state museums. After a long period of negotiating the first six state museums became independent in 1994. The privatising of other state museums occurred in the following years (Langenberg, 1999:118-134). In the cultural policy of 1993-1996 Minister of Culture Hedy d'Ancona argued for admission charges of museums. She claimed that museum visitors are not price sensitive and that it is reasonable to pay for admission. Besides that, free admission was not in line with the policy of the state museums, since this policy prescribed a more entrepreneurial attitude of museums. Instead of free entrance d'Ancona argued that concessions for particular groups should be made, such as for children, students and older people. These concessions should attract a wider audience (Ministerie van Welzijn, Volksgezondheid en Cultuur, 1992).

It is not surprising that nowadays the debate about admission charges still continues. It is a trend for politicians to argue for, or against, free admission in general. This discussion has spread itself among different topics, for instance free admission to busses, trains, schools and so on. The debate about free admission for museums comes up partly due to the ageing of the museum public. After an increase in museum visits during the eighties, museum visits are quite stable over the past years. Dutch museums have a visit rate of two million people per year (van den Broek e.o., 2005: 13-14). In addition more museums exist these days, so the visit numbers per museum is smaller (Sociaal Cultureel Planbureau, 2000: 499-543). At last the Dutch population is growing, while museum visits do not increase (Ministerie van Onderwijs Cultuur en Wetenschap, 2001: 1). Due to these developments audience extension is a main issue in cultural policies. Outside the Netherlands this matter plays a role as well. Great Britain for instance tries to reach a wider audience by charging no admission for National museums. In France the Louvre, one of the largest museums in France, provides free admission on the first Sunday of the month. In contradiction with these countries Sweden just introduced an entrance fee for museums, after having free admission. In line with these developments

several members of the parliament (from the parties VVD, SP and PvdA³) proposed the state secretary of Education, Culture and Sciences in December 2005 a free entrance policy for museums that are state subsidised (Ministerie van Onderwijs, Cultuur en Wetenschap, 2006). This could either be a total free entrance or for certain exhibitions. The regulation that members of the parliament wanted to implement could be described as follow. Dutch taxpayers and their children should receive a 'culture ticket', which gives them free entrance to the state subsidised museums. Dutch taxpayers should get free entrance because the state museums have items in their collections that are state owned; these collections thus should be accessible for everyone. Although the new cabinet proposed to bring in the 'users-pay-principle' the debate about free admission still continues. Nowadays different variants of free entrance to state subsidised museums are discussed. In June 2007 Minister of Culture, Ronald Plasterk, announced an experiment with a free museum policy for children up to twelve years old. These children can access state museums free. The discussion about free entrance to museums does not focus on the moral goal of making the collections accessible only, but aspires another objective as well. The government tends to enlarge participation in culture over a more diverse audience. By giving free admission this diverse audience should be attracted. The first goal is a moral goal, which is hard to examine. Therefore this thesis will focus on predicting whether this second goal is reasonable.

1.2 Research question

Due to the debate about charging for museum admission, it is interesting to analyse museum demand. To answer the question if the entrance fee is a disincentive for visiting a museum, the price elasticity should be calculated. Besides that, other factors that influence demand for museums can be examined. The answer of the research question of this master thesis should give more clarification whether 'to charge or not to charge' is the question. This research question can be posed as follow:

'What is the price elasticity of museum demand, what other factors influence this demand and are there any differences to observe between the different types of museums?'

1.3 Outline

This master thesis is divided in two parts. The first part deals with the theoretical framework of the thesis. In the first five chapters different theories such as the economics of museums, consumer behaviour and price elasticity of demand are

³ These are political parties in the Netherlands, for descriptions of these abbreviations see the explanatory word list in appendix I.

discussed. Also studies about price elasticity of museum demand and socio-economic factors that influence participation in the arts are presented. The second part will provide more information about the research itself. Chapter six gives more insights in the aims and objectives and chapter seven deals with the research at macro level.⁴ In this chapter the data collection methods and data analysing methods concerning the price elasticity are explained. Afterwards the results of this analysis are presented. Chapter eight gives details of the visitors composition. In this section socio-economic aspects influencing demand are observed and analysed. The thesis concludes with verifying or falsifying the hypothesis and answering the research question. At last some recommendations for further research are given.

⁴ The research is done for the whole museum sector in the Netherlands.

2 Economics of museums

2.1 Introduction

The discussion about charging admission fees for museums is related to the economics of museums. Museum services can be regarded as an economic good, both in material and immaterial sense. The material aspects are related to the value of the building, the paintings, and other tangible goods. The immaterial features are for instance the opportunity costs of visitors (Schollaart, 1995: 23). Museums generate demand and supply and have different costs functions. These economic aspects of museums are explained in this chapter. In addition, attention is given to subsidy for museums and the pricing principle, which is the main item of the current debate.

2.2 Demand

Demand for museums services can be categorised in two main streams: private demand and social demand. Visitors for instance can exert private demand, while social demand is predominantly based on external effects of museums. Demand for museum services does not focus on visits only but can also be in the realm of research and preservation. In this sub-section demand for museums services can be regarded as the demand for visiting a museum's exhibition, this kind of demand will be described as demand for museums.

Private demand for museums is determined by several factors. The most important (economic) ones are the entrance fee, the opportunity costs of time, the price of substitutes and income. The entrance fee, in combination with visit numbers, determines the revenue that is acquired by a museum. To predict consumers' behaviour on price changes the price elasticity is estimated. This price elasticity shows the reaction of consumers' demand on price changes.⁵ Besides the entrance fee, the opportunity costs determine museum demand. The opportunity costs include the amount of income a person could have gained during the period of the visit. Another determinant of demand is the price of substitutes. Next to museums there are other facilities where people can spend their leisure time, like cinemas, theatres, and sports. These facilities are substitutes for museums, just as museums are substitutes for other museums. The last economic factor influencing demand is income. Just like the price, the income elasticity of demand can be elastic or inelastic. An income elastic demand for museums illustrates when the income increases, the demand for museums will also increase. In addition to these economic determinants quality and individual preferences also influence museum

⁵ Consumer behavior and the concept of price elasticity are further discussed in chapter 3 and 4.

demand. When a museum has an exhibition of high quality, more people will probably visit the museum because they appreciate the quality. Besides that, consumers have certain tastes (individual preferences) which they develop during their life. If a consumer has not developed a taste for museums, he will not easily attend one.⁶ (Frey and Meier, 2006: 3-5).

Next to the values that are produced for 'real' visitors, museums also generate values for non-visitors. A social value of national museums is for instance the conservation and presentation of national heritage. Besides the preservation of national heritage, social demand includes values that generate external effects. Five external effects can be distinguished: option value, bequest value, existence value, prestige value and education value. People benefit from these values even though they do not attend the museum. Prestige value for instance reflects the importance of having a museum in a city for the city's status, and the option value expresses the possibility to visit the museum in the future, existence value reflects the desire of people to maintain the existence of a museum for future generations. Bequest value is often exerted by the government in the sense that they will subsidise the museum because people can learn from museum programmes and the museums thus exerts values that are 'good' for the consumer. Education value is related to bequest value since it reflects the value of the museum in educating the public about earlier times. These externalities are profitable for the future and contribute to the society and the economy of a city or region (Frey and Meier, 2006: 6-8).

2.3 Supply

Next to the demand side a museum also deals with the supply side of the economy. A museum often is a non-profit organisation, situated in a foundation. In several countries museums are state owned (Grampp, 1989: 167-168). In the museum sector different types of museums exist, varying from libraries to modern art galleries. These museums cover a diverse range of subjects like arts, science, history, and crafts. The types of museums differ in a great extent to each other. The ways the items are displayed differ, but also the public and the activities of the museums differ from each other. Museums do not just supply exhibitions but also have other purposes. The five main functions of a museum are acquisition, preservation, research, education, and exhibition. Acquisition refers to the gathering of paintings, and other materials, for the museum's collection. These materials are preserved by the museum. This preservation takes place to safeguard the items for next generations. Conservation reflects the storage of paintings and the maintenance of the condition of the paintings. To give more detailed information

⁶ More insights about consumers' preferences and other social economic factors influencing demand is given in chapter 5.

about the paintings and their creators, a museum uncovers information through research. This information can be used to educate the public. This education can be either for particular target groups, such as schoolchildren, or for exhibitions in general. The last function, exhibition, is the most obvious one, namely to display the belongings of the museum (O'Hagan and Duffy, 1994: 126-129).

2.4 Costs

Museums deal with a different cost structure than other industries. Museums have for example high fixed costs. A number of assets have to be present before opening the museum and these cannot be modified within the short-term. These assets (the fixed costs) encompass for instance rent for the building, the art collection, staff, insurance etc. The fixed costs remain the same, independent of the number of visitors that will attend the museum. The high amount of fixed costs has consequences for the cost structure of the organisation as a whole. A museum faces a diminishing average costs curve since the variable costs are low. These variable costs are just a fraction of the total costs involved; other costs are for instance the acquisition costs and insurance costs. Since the art market blew-up during the eighties, the acquisition costs are much higher than before. In line with these high prices, the insurance costs are also high. Just like in other sectors of the cultural industries the marginal costs of a museum are close to zero. For instance the marginal cost of an additional visitor does not incur additional costs to the museum as the exhibition is already in place. However, the marginal costs can be higher, for instance when the visitor rate is too high and congestion is caused (Frey and Meier, 2006: 9-13). The total costs of museums seem to be high and therefore subsidy is needed. Nevertheless, museums have a capital stock that does not appear on the balance sheet. The art pieces held by a museum comprise its capital stock. Museums display only 20 percent of their holdings; the rest of the collection is in storage. This is called the 'Prado effect', named after the museum in Spain that only displays 10 percent of its paintings (Johnson, 2003: 315-320). These art pieces are the biggest part of the museum's capital stock. Nevertheless, this capital stock does not appear on the balance sheet, while it is worth billions of euros (Frey, 2003: 36-44). Grampp stresses that it is hard for museums to value their belongings, because the value of art is hard to capture in monetary terms. However museums can consider putting these belongings on the balance sheet, since each piece of art has a market value (Grampp, 1989: 180-181). A large amount of art pieces in storage is not profitable for museums, because these art pieces have to be preserved. Since several pieces are in storage for years it would be more profitable for museums to sell them. This is not the case since museum directors are not always able to sell their belongings because of restrictions, or the belief that selling art pieces is regarded as a potential loss for the art society (Frey, 2003: 36-44).

To cover the costs museums are often subsidised by the government. Over time justification of this subsidy has been widely discussed. Arguments in favour of subsidies are made on the side of both demand and supply. Supply side arguments are deducted from the fact that in an ideal situation a market operates in perfect competition. Since there is imperfect competition, the government has to correct this market failure by supporting supplementary supply. As presented earlier in this section, museums face a different costs structure than other service industries. If museums have to cover all the costs themselves, the entrance fees will be high. To impose lower prices the government covers part of the costs museums face (Frey, 2003: 393). On the demand side there are also market failures present that the government should correct. At first museums generate external benefits, which are explained in the demand section. The 'users' of these external benefits do not pay for them, and therefore a (monetary) compensation is a necessity for museums. Secondly, museums generate other values such as option value and bequest value. These values are not expressed through the market and therefore are called non-market demand. To generate a social optimal demand museums need a subsidy to satisfy this demand. At last museums face some public good characteristics. National heritage is preserved by the museums, and therefore museums should be rewarded (Frey, 2003: 390-392). Next to these arguments in favour of subsidy, counter arguments are also given. External effects are argued to be small, or even similar in other industries. Besides that, it is claimed that subsidies only favour the well-off, and therefore are unequally distributed. At last, the system that divides the subsidies is often criticised. It is said that this system favours the 'star' museums, while new innovative museums or galleries are neglected (Frey, 2003: 393-397).

Next to subsidies and earned income, museums receive gifts to cover the costs. These gifts are mostly given to non-profit museums in the United States. However, museums in Europe also receive gifts. In addition to private gifts museums often have a 'friends of the museum association'. This association sells memberships and organises activities to collect money for the museum. Besides monetary gifts museums also receive gifts in the shape of inheritances. These inheritances consist of private collection of paintings or other art objects. These kinds of gifts are not always profitable for museums for the reason that the value and the condition of the collection do not always meet the museum's standards. In addition, givers can make strict requirements concerning the purpose of the collection, which may contrast with the museum's policy (Grampp, 1989: 183-189).

2.5 Prices

One part of museum incomes derives from the entrance fees. In economic terms the entrance fee reflects the value of the visit. The number of attendance multiplied with the

entrance fee should reflect the value of the collection. In practise this is not the case. Museums often have low admission charges and could earn more money if price discrimination is applied. Museums do apply price discrimination, but not to a great extent. Different prices are charged for children, elder people, and students. Besides these variants some museums charge different prices during particular days. However, museums do not have fixed prices. Fixed prices would reflect in a low price during quiet opening hours and in high prices during crowded hours. In which extent museums can increase the price is expressed through the price elasticity of demand. A low price elasticity enables museums to charge high prices, while a large (elastic) elasticity reflects a minor change in price (Grampp, 1989: 192-196). Since the incomes from admission fees are just a small fraction, museums should not expect huge results after adopting different price strategies. Rudenstein (1989) for instance shows that the entrance fee is only around 20 percent of the museums total income.⁷ The cause of the minor role the entrance fee plays in the museums total income is the way museums are subsidised. Since the government covers a great deal of the museums' costs, museums can charge relative low admission fees. Some museums are even free, for the reason that they must be accessible for everybody. As explained in the introduction, discussions on charging for museums are a main issue. The question that is raised often is 'too charge or not too charge' (O'Hagan and Duffy, 1994: 137-139).

2.6 Conclusion

Just like in other fields of economics museum services create supply and demand. Museum demand is determined by both economic factors such as price, as social factors like taste. Besides private demand museums also generate social demand. The supply side of museums deals with the different functions a museum has and does face a specific cost structure in which the fixed costs are high and the marginal costs are low. This results in diminishing average costs curve. To cover the costs museum often receive subsidy. Because of this subsidy admission charges are low. These low admission charges should attract a wide audience. However politicians debate about charging admission fees and the possibility to make museums accessible for free. Besides the moral objective of free entrance, it should attract more visitors. In spite of this, several people, like Frey and Meier, argue more factors are influencing museum demand. In the following chapter the determinants of demand are observed more in to depth.

⁷ Rudenstein contributes to Feldstein's book 'The economics of museums' in the chapter about finances of museums.

3 Consumer theory

3.1 Introduction

As shown in the first sub-section of the previous chapter, demand for museums is determined by several factors. Three of these factors are taste, income and prices of substitutes. These determinants are all part of the consumer theory. In the previous chapter two types of demand are discussed, namely social and private demand. The consumer theory deals with private demand only, which is demand exerted by consumers. The consumer theory is a part of the theory of choice, which deals with all kinds of demand. In this chapter the consumer theory is presented to partly clarify consumer behaviour in relation with museum demand.

3.2 Taste, income and prices of substitutes

The consumer theory shows the decision making process of people, given someone's personal taste, income and the prices of substitutes.

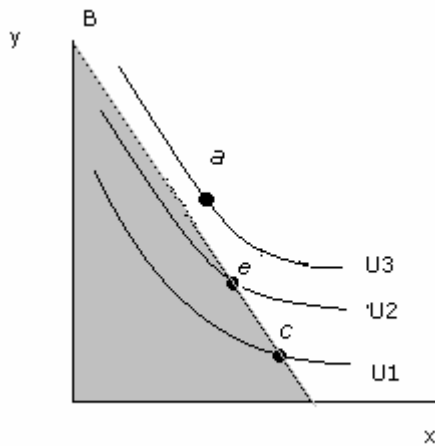
3.2.1 Taste

Taste reflects someone's preferences, or in other words the demand, which can be specified by three assumptions. The first one is the completeness assumption, which encloses that a consumer can express certain preferences for goods. The second assumption is the transitivity assumption; this assumption ensures that a consumer's preference is consistent. The last assumption is the 'no satiation' assumption. Consumers always tend to prefer more and are never satisfied. This last assumption is less essential than the previous two, since consumers will reach their point of satisfaction on a certain time (Katz & Rosen, 1998: 22-23). According to the consumer theory, consumers make well informed and rationalised decisions. The indifference curve shows on which point (rate) a consumer is willing to trade one good for another. This point is called the marginal rate of substitution (MRS). An indifference curve always slopes downwards since there is a no satisfaction assumption. To determine between which goods a consumer will choose is quite simple with a comparison between two goods; see figure 3.1 good x and y. To predict this decision an indifference curve can be used. When a consumer has to choose between more commodities an indifference curve only is not suitable to predict consumer behaviour. In this case the utility function should be calculated. The utility function shows the utility associated with each commodity.

In figure 3.1, three different utility functions are shown (U1, U2 and U3). By comparing the utility functions with each other, the preferences of consumers can be predicted. Each utility function shows the preference for product x in relation to product y. Besides

the utility function other factors influence the preferences of consumers, like income and prices of substitutes. These factors are discussed in the following sections (Katz & Rosen, 1998: 24-35).

Figure 3.1: *Budget constrains, with utility numbers and consumers' equilibrium.*



3.2.2 Income

The first part of the consumer theory deals with the influence of taste on consumer behaviour. This part shows what consumers would like to do. However, there are some constraints to this taste, namely the budget (income) a consumer has. The collection of commodities that can be bought is called the feasible set. In figure 3.1 the feasible set is marked as the grey area, and the budget constraint slope is B. The budget constraint is subjected to changes in income. When the income of a consumer decreases, the line will shift to the left. Besides changes in income there can be a change in relative prices. This also has an effect on the budget constraint. When prices increase, the budget line moves along the axis of the good whose price did increase (Katz & Rosen, 1998: 37-42).

The preferences and income of consumers show what consumers would like to do and what they actually can do, to predict the behaviour of consumers these two steps should be merged. The goods that a consumer buys are goods that fit their preferences best, subject to the budget constraint. The rate at which this is reached is the equilibrium. This point is achieved when the marginal rate of substitution is equal to the slope of the budget constraint:

$$MRS_{yx} = \frac{P_x}{P_y}$$

Figure 3.1 shows the equilibrium at point e, a and c. These points all show a degree of satisfaction for good x and y. In this case point e is the equilibrium since it is closer to utility function two. Utility function two shows the highest utility and is equal to the slope of the budget constraint. Utility function three does not meet the budget constraint and

therefore does not fit the satisfaction of the consumer. Utility one does fit the satisfaction of the consumer, but utility function two fits the satisfaction better, since this utility function maximises the consumer's utility best (Katz & Rosen, 1998: 43-52).

3.2.3 Prices of substitutes

While selecting goods the consumer does not only focus on the price of the specific good itself, but also on prices of substitutes and additional price factors. When someone buys a museum ticket, not only the entrance fee is important, but also entrance costs of other leisure time activities and additional costs, such as travelling costs, play an important role. The price sensitivity of consumers is influenced by competing activities, and is depending on the nature of the good. The higher the number of available substitutes, the more price sensitive the consumer will be. The more unique a good is, the less sensitive the consumer will be for the price (Goudriaan et al. 2002: 33-34).

3.3 Conclusion

The package of goods and services consumers acquire should fit their personal utilities as good as possible, so people can reach the highest feasible level of satisfaction. This process of maximising the utility function results in a system of relations, wherein the demand for goods and services depends on taste, income, and prices. When analysing museum demand these three factors should be taken into account. The following chapter will analyse the relationship of price and demand in a broader sense.

4 Price and demand

4.1 Introduction

Demand for museums is not only determined by the preferences of consumers, their income, and prices of substitutes. The price of a museum ticket plays a role as well. The reactions of consumers on price changes can be predicted by calculating the price elasticity. When the price elasticity is calculated a judgement can be made about the effects of free admission to museums on demand. In this chapter the price elasticity of demand is discussed and characteristics of price elasticity of museum demand are shown.

4.2 Price elasticity of demand

To define the price sensitivity of consumers the price elasticity must be calculated. Price elasticity of demand can be described as a reaction of the quantity demanded to price changes. This price elasticity is calculated by the percentage change in quantity demanded divided by the percentage change in price:

$$\varepsilon = - \frac{\% \Delta X}{\% \Delta p}$$

ε reflects the price elasticity of demand and Δ stands for change. X is a symbol of demanded quantity and p represents price. Price elasticity is used to predict how the amount of money spent on a good changes when the price changes. The elasticity of demand is elastic if the increase or decrease in demanded quantity is proportionally larger than the increase or decrease in price. When the increase or decrease in demand is proportionally smaller than the increase or decrease in price, the price elasticity of demand is inelastic. Thus, when looking at the formula, an ε larger than one portrays an elastic price elasticity of demand and an ε smaller than one portrays an inelastic price elasticity of demand (Katz and Rosen 1998: 73-77). Figure 4.1 shows the effects on total expenditures in the case of different elasticities when price increases or decreases.

Figure 4.1: *Price elasticity of demand and the effects on total expenditure.*

Price elasticity	Effect on Total Expenditure	Effect on Total Expenditure
	When Price Increases	When Price Decreases
Inelastic ($\varepsilon < 1$)	Increase	Decrease
Unitary ($\varepsilon = 1$)	Same	Same
Elastic ($\varepsilon > 1$)	Decrease	Increase

Source: Katz and Rosen, 1998: 79.

There are different factors involved in determining the price elasticity of demand. When there is a close substitute for the good, the demand for the good is more elastic. If a region has two visual art museums, this can be the case. When the price of a ticket for one visual art museum goes up, people tend to go to the other visual art museum in the region, so their price elasticity of demand is large or elastic. The regulation of making state museums free can cause a loss of visitors for non-state museums in the same region. The precise way in which a good is described can also have impact on the price elasticity. An art museum can have a substitute, but for the Van Gogh museum this is harder, for the reason that there is only one van Gogh museum and there are more visual art museums. The second factor is the consumers' budget. In general, the case is that the smaller the budget, the less elastic the demand is. The third factor is the timeframe. Sometimes a price change does not have its effect on society right away and people will not respond immediately on it. That is why the price elasticity of demand for a good is larger on the long-run (Katz and Rosen 1998: 79-80).

4.3 Price elasticity of museum demand

Although the effect of free entrance on the number of museum visits is a popular political topic, there is a small amount of empirical research done on this subject. Most studies focus on the effect of introducing entrance fees or increases in prices. The main question in these studies is if the price elasticity of demand is elastic and if prices thus influences the disincentives of visiting a museum. Besides that studies focus on the revenue a museum will lose or gain by changing for (a higher) admission.

4.3.1 Price elasticity

Estimating price elasticity of museum demand or more in general demand for the arts, requires an alternative formula than the formula presented in paragraph 4.2. Since cultural goods and services are not primary necessities of life, predominantly a logarithmic formula is used to estimate the price elasticity for these kinds of goods and services. This is also the case when estimating price elasticity for sports demand. Principally the price elasticity is estimated based on the outcomes of a derived demand function, which is estimated by using the Ordinary-Least-Squares (OLS) method. (Seaman, 2006: 1-24, Goudriaan, 1984: 2-5). Most studies that estimate price elasticities of demand in the field of cultural economics estimate price elasticities for the performing arts. The article of Seaman (2006) gives an extensive overview of these studies. This overview shows that (nearly) all researchers use the OLS method and most of them do also apply a double log technique. Especially the surveys of Felton (1987, 1992 and 1994), Throsby (1979 and 1990) and Goudriaan & de Kam (1983) give a clear

overview of the use of this method. Only a few studies focus on the price elasticity of museum demand. In the following table a short overview of these studies is given.

Figure 4.2: *Price elasticities of demand.*

Research	Year	Country	Short-term elasticity	Long-term elasticity
Goudriaan	1984	Netherlands	0.14	0.38
Darnell et al.	1990	Great Britain	0.54	-
Luksetich and Partridge	1997	United States of America	0.12	0.26
Darnell et al.	1998	Great Britain	0.26	0.52

In 1984 Goudriaan researched the price elasticity of museum demand for ten state museums. In line with the survey of Goudriaan and de Kam (1983), wherein the price elasticity of music and theatre demand is estimated, a double log technique and an OLS method is used to estimate the derived demand function. Goudriaan uses the next formula:

$$\log B = a + b \log Y + c \log P_s + d \log P + e \log B_{-1}$$

In this case B reflects the visitor index, which is divided by the population index. Y reflects the available income index of families, which is also divided by the population index and divided by the consumer price index (CPI). Demand and the available income are divided by the population index since the price elasticity of demand for a museum visit is calculated. P_s is a measure of the price index of substitutes, divided by the CPI and P is the index of the entrance fee, also divided by the CPI. All price variables are divided by the CPI to correct the prices for the inflationary tendency. At last a variable for habit persistence is adjusted (B_{-1}) by delaying the demand (B) with one year. Since the variables are specified in a double log function, they can be interpreted as price elasticities immediately. The price elasticity of demand for a small period is 0.14. For the long period the elasticity is also estimated by dividing the short-term elasticity by one minus the variable for habit formation.⁸ By applying this technique the long-term price elasticity gives a value of 0.38. This is in line with what is explained in the theory of Katz and Rosen. They argued the long-term price elasticity of demand is larger than the

⁸ In a formula this will be written as follow: $\varepsilon^{LT} = \varepsilon^{ST} / (1 - B_{-1})$. ε^{ST} reflects the short term elasticity and ε^{LT} the long term elasticity.

short-term one. Between the different state museums there are hardly any differences (between 0.01 and 0.03). Causes for these low elasticities are that tourists visit many of the state museums. Besides that, the entrance fee is just a small part of the total costs (travelling costs, opportunity costs) and people attend museums out of habit formation. At last the educative function of museums influences the price elasticity, since state museums are often visited by large groups of schoolchildren who do not have to pay an entrance fee (Goudriaan, 1984: 2-15).

Darnell et al. studied in 1990 the price elasticity of the Beamish museum, an open-air museum in Great Britain. The price elasticity for this museum is 0.54. This is a relative higher elasticity than the other ones. A cause for this difference is the character of the museum's collection, which is more entertaining than the other ones (Darnell et al., 1990: 251-257). The method that is used is not described in the study.

In 1997 Luksetich and Partidge estimated the price elasticity for American museums. In this research a distinction is made between different types of museums. The results show a price elasticity of demand between 0.12 and 0.26. Remarkable is the low price elasticity that historical museums have, while most of them are free. Luksetich and Partidge state that museums are not price sensitive. Further more they argue there is a positive association between attendance and quality. When the admission fee is higher, quality can be improved and thus more visitors will come (Luksetich & Partridge, 1997: 1557).

Darnell et al. as well estimated the price elasticity of museum demand for the Bowes museum in England, which has a collection of European fine and decorative arts. The price elasticity is estimated to advise the Local Authority Museums (LAM) about their management styles. For the short-run this elasticity is 0.26 and for the long-run 0.52. However the paper argues that this price elasticity cannot predict a management style. To attract more visitors or to generate more revenue more studies are needed, which provide more socio-economic characteristics of the public (Darnell et al, 1998: 86-91).

Overall the price elasticities are low, which indicates that a change in price will not cause huge differences in demand. It is remarkable that most surveys talk about museums in general, while the previous chapter shows big differences between types of museums. Therefore it will be interesting to research differences between museums with different kind of collections.

4.3.2 Price and demand

Most studies about museum demand and admission charges focus on the introduction of fees or increases in prices. More recent studies deal with the introduction of free entrance. In figure 4.3 an overview of these studies is given.

Figure 4.3: *Influence of entrance fee on demand.*

Research	Year	Country	Effect on demand
<i>Increase in price</i>			
Goudriaan	1985	Netherlands	Decrease
Darnell et al.	1990	Great Britain	Decrease
O'Hagan and Duffy	1994	Great Britain	Increase
Bailey et al.	1997	Great Britain	Stable (depends on museum)
Luksetich and Partridge	1997	United States of America	Decrease
Darnell et al.	1998	Great Britain	Decrease
Kirchberg	1998	Germany	Decrease
Johnson	2000	Great Britain	Decrease
<i>Free entrance</i>			
Martin	2002	Great Britain	Increase
Goudriaan and Visscher	2006	Netherlands	Increase
<i>(extra) Free day</i>			
Steiner	1997	United States of America	Increase
Goudriaan et al.	2002	France, Great Britain	Increase

A change in price

The introduction of an entrance fee or an increase in ticket price affects demand for museums most of the time in a negative way. However, this depends on the type of museum. The study of Goudriaan (1985) shows some differences between museums. Goudriaan did a case study on the effects of the introduction of entrance fees for four museums in Rotterdam. The more recreation orientated museums are, the more the visits decline after introducing an entrance fee. Visual art orientated museums did not face this effect. Their visits declined with a lower amount. This is caused by the higher amount of competition (amount of substitutes) that the recreational museums face (Goudriaan, 1985: 61-65).

The study of O'Hagan and Duffy shows that the entrance fee is not the most important factor that influences demand for museums. This research illustrates an increase in visits after an entrance fee is adjusted. This is partly caused by a large amount of foreign tourists, who are not very sensible to price changes. Furthermore the absence of substitutes for the museum and the changes in quality the museum has accomplished cause the increase in visits. (O'Hagan and Duffy, 1994: 134-146).

Bailey et al. also noticed some increases in demand after an increase in ticket price. The same research also shows a decrease in demand. Causes for these differences are the different (marketing) strategies of museums. Also the kind of exhibition of the museum plays a role. At last Bailey et. al. notices that visitor numbers are not always reliable. Museums with free admission do not count their visitor numbers efficiently while paid museums count their visits by the number of tickets that are sold. Comparing these numbers is thus not always reliable (Bailey et al, 1997: 358 – 365). Johnson (2000) also raises this argument.

Free entrance

Politicians argue that abolishment of admission charges will attract more visitors of different socio-economic groups. To verify or falsify this notion different case studies are done. In Great Britain Martin did a survey among the British population to measure the impact of free admission to museums. 45% of the British residents visit a museum or gallery in 2002, which is an increase compared with the previous years. 15% of the British population claims to go more often to museums since they are free. Nevertheless this group is highly represented by current visitors (70%). New audience groups are barely attracted through this free admission policy. Barriers for visiting a museum are lack of time, lack of transportation or lack of interest (Martin, 2002: 4-8).

In the Netherlands Goudriaan and Visscher did a survey about the effects of free entrance to state museums. In this research the costs and effects of free entrance are estimated. The effects of free entrance to state museums are limited. The calculated increase in visitor rate varies per type of free admission⁹ from 0.3% until 3%. This is caused by the fact that in the case of free entrance to state museums people will visit the state museums more often and will not visit non state museums anymore. There are hardly any new visitors; there is only a shift of visits. Besides that, state museums will face higher costs per visit since more visits will require more cleaning and security and may cause congestion. Goudriaan and Visscher claim that free entrance can only be realised with more subsidy from the government (Goudriaan and Visscher, 2006: 49-56).

Free day(s)

Since there are several ways to charge for admission some studies are done to illustrate the impact of these options. Faye Steiner did a survey on adding an extra free day for the five biggest museums in America. These museums already had a free Wednesday per week. Attendance on the current free day is 65% higher than on regular days, but there is a loss in revenue. This is caused by the fact that the shop and restaurant earnings do

⁹ This is varying from total free entrance to a Sunday per month.

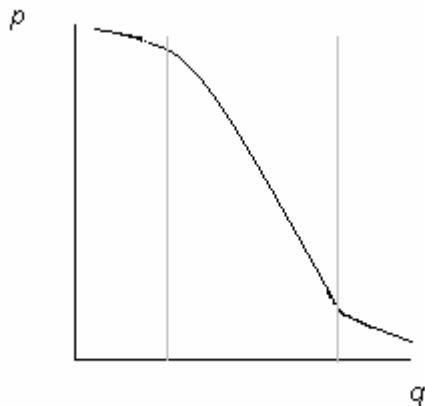
not rise as fast as the visitor number on free days. From an income maximising viewpoint it will not be profitable to add another free day. Within a social perspective this is also the case. Free days do attract more visitors, but this declines the amount of visitors on other days. Steiner does mention that more people with low price elasticities of demand visit the museum and therefore another free day is not necessary. In this research the difference between number of visits and number of visitors is not taken into account. Therefore the amount of extra visitors on free days should be regarded with some cautiousness. These extra visits can be made by current visitors who attend the free days more often than the regular days (Steiner, 1997: 309-325).

Apart from Steiner Goudriaan et al. researched different cases of (partly) free entrance. By order of the ministry of Education, Culture and Sciences the case of the free Sunday in the Louvre (France) is studied. Since 1996 the Louvre is one Sunday per month free of charge. On this free Sunday the visitor rate is 60% higher. For the French population this is even 130%. Tourists often prefer to visit the museum on another day, when it is less crowded and they have to pay for admission. The Louvre regards this 'free-Sunday-policy' as an investment in public and future. On a free Sunday the revenue is lower, in spite of the returns from the museum shop and restaurants. During the free Sunday people spend less money than on other days (Goudriaan et al., 2002: 64-67).

4.4 Conclusion

The surveys presented in the previous section have mainly the same conclusion; the entrance fee does not affect the number of visits radically. The price elasticity of demand is inelastic in the short-run as well as in the long-run. This is caused by three main details. At first museums are often visited by tourists who are not sensitive to price changes because their other costs are relatively much higher than the entrance fee. This also counts for other visitors, since the entrance fee is just a small fraction of the total costs that visitors have. An increase in entrance fees thus does not have a large effect on the total costs, such as travelling costs and opportunity costs. However, for tourists this effect is even smaller since their other costs are much higher. Secondly, an increase in price gives a museum more financial resources to enhance the quality. Since quality and visitors numbers seems to be positively associated, enhance in quality will result in more visitors. At last, the price elasticity of demand for museums is low for the reason that museum visitors are often art patrons who visit the museum anyway.

Although the surveys show a low price elasticity of demand, the price elasticity of museum demand is not small at each point of the curve. As van Puffelen (2000: 61) states there are two boundaries to this elasticity.

Figure 4.4: *Demand curve.*

The first one is on the top of the curve where the price is that high that no one can afford it (see figure 4.4, grey line). The other point is at the bottom of the curve, where the price is that low that anybody can afford it. The space between the borders (see figure 4.4, grey line) shows where the elasticity is small. However, this last border is in this case spurious. As the researches show that free admission will not cause a rapid grow in numbers of visits. This is because museum visits are in a large extent subjected to taste. Also Darnell (1998) claims that with inelastic price elasticity the demand curve will still face a point (price) where the demand will be zero (Darnell, 1998: 190)

5 Socio-economic factors influencing demand

5.1 Introduction

Demand for museums is, as noticed before, quite stable. One out of three Dutch people visit a museum (SCP, 2000: 501). Different studies to measure the price elasticity of museum demand show that since the price elasticity is inelastic the entrance fee is presumably not the biggest barrier to visit a museum. Next to the economic theories social theories explain museum demand. According to sociologists there are different socio-economic factors that influence demand and thus participation in the arts. In this section these factors are discussed. At first there is attention for other costs, besides the entrance fee, consumers face during a visit and also the income of consumers is discussed. Next to these economic factors, social factors influencing demand as education and upbringing, available time and social background are presented.

5.2 Costs

In the previous chapter the impact of admission charges to museum demand are discussed. The entrance fee does not enclose the whole costs a visitor has for the visit. Actually the entrance fee is just a small proportion of the total amount. Travelling costs are often a larger part of the total costs. A museum ticket costs for instance about seven euros while a train ticket from Rotterdam to Amsterdam is already two times more expensive. Also travelling costs for cars are relative high for museum visitors. In 2004 visitors of cultural activities travelled an average of 15.8 kilometres for their visit. Other leisure time activities did not cost that many travelling time (Harms, 2006: 34). In addition to the gas a car driver has to pay also a (principally expensive) parking ticket is a part of the costs. Besides transportation costs, a visitor has other additional costs like the consumptions in a restaurant or cafeteria. Since a museum visit is often a day trip these costs can increase to an amount that is three times higher than the costs of a ticket. Another cost factor that influences museum demand are the opportunity costs. The opportunity costs are costs made by giving up something else while consuming the good (Katz and Rosen, 1998: 3). When someone visits the museum instead of going to work, the amount of money that is not earned during that time reflects the opportunity costs. The higher someone's salary is, the higher the opportunity costs are.

Besides the costs of the museum ticket itself, the consumer is also confronted with costs of other activities. The more substitutes a museum has, the more the consumer will compare the prices of substitutes with the price of the museum. In this case, the consumer decides to visit the museum based on costs of other activities. As explained in

paragraph 3.2.3, more recreational orientated museums have more substitutes than visual art museums.

5.3 Income

According to the consumer theory, a change in income often causes a change in demand. Since museum visits are not that expensive the income does not seem to be a big influence on museum demand. This lack of income effect can be caused by several factors. Since museums are subsidised the price of a ticket is low. Because of this low ticket price museums are accessible for different income groups. Next to that surveys often give only visit rates and do not take into account the extra monetary expenses of visitors. Museum visits, and other cultural activities, are often time taking. Because of this time taking aspect, the opportunity costs for a museum visit are high. These opportunity costs are higher as the income is higher. People with a higher income make more money per hour and thus use up a higher amount of money while visiting a museum in contradiction to people with lower incomes. In spite of this, people with high incomes visit museums more often than people with lower incomes do (Ganzeboom, 1989: 34-36). Most surveys do not show a difference in visitors' profile of visitors of different kind of museums. The US Census Agency does present statistics about visitors of art museums, wherein is demonstrated that visitors of these museums have a higher income than visitors of other types of museums have (US Census, 2000: 266). Kirchberg (1996) as well distinguish different types of museums from each other while analysing differences between visitors and non-visitors. In a population survey in Germany Kirchberg distinguishes four types of museums from each other, namely history museums, visual art museums, science museums and natural history museums. The results show that the different types of museums attract different kinds of visitors. In line with this the income also differs per museum type, visual art museum visitors have a higher income than other type of museum visitors. Kirchberg even states that non-visitors cannot be easily distinguished from museum visitors based on their income if museums are not separated from each other based on the type of their collection. This is caused by the fact that there are considerable differences in visitor's profile of the types of museums (Kirchberg, 1996: 243-257).

5.4 Available time

Apart from the money people spend on museum visits, available time is also a factor that influences the amount of visits. As stated in the previous section time reflects money through the opportunity costs. The more time taking an activity is, the smaller the public will be because of the time and money optimising behaviour of people. The time aspect influences museum demand less than for instance demand for theatre performances. A

museum visitor can decide the date, hour and length of the visit, while a theatre visitor is restricted to the time and length of the performance (Ganzeboom, 1989: 36-39). The amount of leisure time of consumers did decrease over the past years. In 2006 the average Dutch inhabitant spent 44 hours per week on leisure activities. This amount decreased with 3.5 hours compared to the situation in 1975. This is caused by the increase of hours spent on commitments such as work (www.tijdsbesteding.nl). Differences in the available time of people affect the frequency of visits and time spent per visit. People with children under 14 years are most restricted in their time. Young single persons, without children, suffer the least from this barrier (Maas et al., 1990: 124-127). The survey of Kirchberg, which was also discussed in the previous subsection, as well shows the influence of having young children to museum demand. This effect is especially visible for visual art museum visitors; these kinds of visitors do not often have young children in contradiction to visitors of science museums (Kirchberg, 1996: 243-257).

5.5 Education and upbringing

Several studies show that education plays a role in participation in culture. According to the presumption about how people process information, culture is an intellectual good or service. This represents the thought that consuming culture requires intellectual preparation and effort. Since higher educated people have the skills to make this intellectual preparation and effort, these people visit the arts more often (Ganzeboom and de Graaf, 1991: 133-135). The higher the education levels the better people understand the context of cultural activities. Education does not necessarily mean cultural education, but education in general. When people are educated well, their cognitive functions operate well. This generates a better absorption of cultural information. Ganzeboom states that education is one of the most important determinants of demand (Ganzeboom, 1989: 46-51). Apart from Ganzeboom other researchers take into account this effect. Martin for instance researched the composition of the British museum public and concluded that 30% of this public has a master degree. This is a high amount in comparison with the fact that only 18% of the total British population has a master degree (Martin, 2003: 4). Also Kirchberg recognises the influence of education, in a population survey situated in Germany education turns out to be the most important determinant of demand for museums, for visual art museums education even has a stronger effect (Kirchberg, 1996: 255-257).

Next to education, also upbringing plays a role in participation in culture. As the sociologist Pierre Bourdieu describes in his cultural capital theory, cultural capital in the embodied state provides inherited traditions, tastes, and acquired assets from your family (Bourdieu, 1986: 243-248). If visiting culture is ordinary in your family, you will

take over this habit in your future. In this way your habit of visiting culture is formed. While visiting culture a person accumulates some cultural knowledge, which also is an important factor that influences participation in the arts. The higher the cultural knowledge, the better someone can process the information acquired by cultural activities. This aspect of participation in culture is not researched that often. But studies that took this aspect into account show that upbringing does play a large role in influencing (museum) demand (Ganzeboom, 1989: 176-177).

5.6 Social environment

The issues discussed before all relate to more personal aspects that influence museum demand. Since participation in cultural activities is not a pure individual act, the social environment does also influence demand. This can be either a positive or a negative influence. Social behaviour of people relies on standards and values of a society or a group of people. In a social group there are certain values and standards. If this group regards participation in culture as a standard, the group members will visit cultural activities more often. In addition, status plays a large role. People often visit a museum to gain status in their social network and to contribute to the conversations about art. This is mainly visible in circuits of high-educated people (Maas, 1991: 124-127 and Ganzeboom, 1989: 176-177).

5.7 Conclusion

Demand for museums is not influenced by the price of the ticket only. Other costs also influence demand, such as opportunity costs, travelling costs and restaurant costs. Besides cost income and available time influence demand. These three factors are strongly related to each other. Besides these economic determinants also social factors play a role. Education and upbringing influence the demand because they acquire people cultural information they need to appreciate arts. At last the social environment is a determinant. If someone circulates in a social circle that regard art as important, this person will visit the arts more often. If museum demand is analysed these factors should also get attention.

6 Hypotheses

The four theories presented in the theoretical framework are all related to museum demand. The theories about the economics of museums shows that demand for museums is determined by the entrance fee, opportunity costs, prices of substitutes and income. Some of these determinants of demand are also discussed in the consumer theory. This theory explains how people express their preferences and with which constraints they have to deal. The third theory, about price elasticity, deals with the entrance fee mostly. The formula to estimate the price elasticity, should predict how a consumer reacts on a price change. The outcome of this estimation of course depends on factors as income, time, and prices of substitutes. At last a theory is used to give a complete image of demand for museums. Demand is not only determined by economic factors, but also more social factors as education, social environment, and upbringing seem to play an important role.

This theoretical story brings up the following central question:

'What is the price elasticity of museum demand, what other factors influence this demand and are there any differences to observe between the different types of museums?'

The different theories presented in the previous chapters all give a certain amount of information concerning this research question. Prior surveys and developed theories generate particular expectations about the conclusion of this thesis and thus are the basis of five hypotheses that are formed. The hypotheses are formulated as follow:

1. Museums have both an inelastic short-term and long-term price elasticity of demand, whereby the long-term elasticity is larger than the short-term elasticity is.

Since many studies (Goudriaan, O'Hagan and Luksetich & Partridge et.al.) have shown that the price does not influence the demand for museum in a great extent the price elasticity of museum demand is expected to be small (inelastic). There will be a difference between the price elasticity in the short and long-run. The price elasticity theory shows that in the long-run the price elasticity will be bigger because consumers need time to react on price changes (see Katz and Rosen). The studies presented in chapter three also show this effect. Although the long-term price elasticity is expected to be bigger than the short-term one, the long-term price elasticity will probably still be small. Goudriaan for instance shows a short-term elasticity of 0.14 and a long-term

elasticity of 0.38. Darnell et al. (1998) show a short-term elasticity of 0.26 and a long-term elasticity of 0.52.

2. The price elasticity of museum demand does not differ among countries and across periods.

Given that art lovers often visit museums, the price elasticity of demand will not be different among time and countries. Museum visitors visit the museum often out of habit persistence and therefore they do not react on price changes in a great extent. Besides that, surveys do not show big differences over time and across countries. All studies show small price elasticities, whether the study is done in the eighties or nineties, in the Netherlands or the United Kingdom, see for instance Goudriaan (1984), Darnell et.al. (1990) and Luksetich and Partridge (1997). Besides these studies more general papers concerning price elasticity of museum demand state that it is well known the this elasticity is inelastic, see for example Kirchberg (1998), Darnell (1998) and Johnson (2000).

3. Visual art museum visitors will have a smaller price elasticity of demand than other types of museums.

Since mainly high-educated people visit visual art museums, the price elasticity for art museum demand will be smaller than for other museums. These people are often truly interested in visiting the museum and thus not sensitive for the price.

According to the consumer choice theory consumers have a propensity to make their choice for a good based on the price of the good and the price for substitutes. Since visual art museums have a unique collection there are lesser substitutes. Other kind of museums do face competition of other leisure time activities and are thus more sensitive for price changes, which result in a higher price elasticity of demand. This is showed by Goudriaan (1985) who researched the impact of introducing an entrance fee for four museums in Rotterdam. The demand for the Boijmans van Beuningen museum (visual art museum) did not changed in a great extent, while the Buffel (a museum ship) faced a huge loss in demand after raising the prices. Also a research by Darnell et. al. (1990) shows that different types of museums have different elasticities of demand. Darnell estimated the price elasticity for a more entertaining type of museums and found an elasticity of 0.54, which is in comparison with other studies relatively high for museums.

4. Besides price, education, income, available time, and social environment are also factors that influence the demand for museums.

The surveys of Ganzeboom and Maas show that besides price other factors are playing a role in participation in culture. The type of education, the level of income, the amount of

time available and the social environment of people do also influence the demand. Besides Ganzeboom and Maas, Frey and Meier distinguish different factors that influence demand. Next to the economic factors, such as income, the influence of the social environment and education are noticed.

5. The different determinants of museum demand have a different effect on demand for a visual art museum than demand for museums other types of museums.

Since the different types of museums require different kinds of knowledge and taste, the factors (income, education et. al.) will play a different role in influencing demand. Goudriaan (1985) shows differences in socio-economic characteristics of consumers of a visual art museum and another museum. Visitors of other types of museums often visit the museum with children and have a lower education level. Visitors of visual art museums make often repeat visits to the same museum and are higher educated (see for instance Kirchberg, 1996). Therefore it is expected that the determinants of demand have a different effect on visual art museums than on other types of museums.

These hypotheses are tested by analysing different kinds of data. The first three hypotheses will be confirmed by analysing data concerning earnings and visit numbers of museums. The last two hypotheses will be verified or falsified by analysing data of a population survey.

7 Price elasticity

7.1 Introduction

After exploring different theories in the theoretical framework and deducting hypotheses from these theories, the empirical part of this thesis can be presented. The main focus of this chapter is the development of prices and demand for museums. Price and demand for museums in the Netherlands are studied, both for museums in general as for separate categories of museums. Based on the data about prices and demand the price elasticity is estimated. In the first sub-section the data collection methods are explained. Secondly prices and demand are analysed, as a result of this a conclusion is drawn, and the first three hypotheses, concerning price elasticity of museum demand, are answered.

7.2 Data collection methods

Within this subsection the population and period of the research is presented. Secondly, the sources and methods of the analysis are explained.

7.2.1 Population and period

The population of this thesis consists of a large group of museums in the Netherlands. More specifically the population encloses museums that are involved in the biannual survey of the Bureau of Census (CBS) in the Netherlands.¹⁰ The museums that are selected by the CBS meet the requirements within the definition of the International Council Of Museums (ICOM), which is as follow: '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.' (<http://icom.museum>) Even though the 'free entrance' discussion does concentrate mainly around state subsidised museums, the decision is made to attract a wider population so clarification can be given about the influence of price changes on demand for the whole museum sector in the Netherlands.

The prices and demand for the selected museums are analysed over a period of twenty years. The period starts in 1983 and ends in 2003. Since the CBS survey is biannual,

¹⁰ Within this survey almost 1000 museums in the Netherlands participate. The museums involved in this survey are not constant over the years. Since museums that attract the largest amount of visits are represented in the whole period the population is representative for this survey. The amount of museums does not differ to a great extend.

2003 was the most recent year where data was available.¹¹ The length of the period is determined by the fact that the price elasticity can be estimated better if a longer period is available.

7.2.2 Univariate analysis

To estimate the price elasticity an empirical method suits best. This method focuses on studying hard facts. In this case hard facts are prices and visit numbers of museums. These data are transferred to a SPSS file. Some data are recoded and cleaned up to exclude errors and missing values (Seale, 2006: 311). The first analysis is a univariate analysis, which gives an overview of single variables. Within this analysis the entrance fee and the demand for museums are analysed. Besides analysing the entrance fee and the number of visits, other aspects are taken into account. The available income per household is analysed together with the consumer price index (CPI) and the prices of substitutes. By analysing these kinds of prices the development of the entrance fee can be put in a broader perspective. To analyse the CPI and the prices of substitutes over the whole period different time series are connected to each other. In addition, the population growth and the number of museums in the Netherlands are examined to observe if these variables are related with the development of the number of visits. At last the impact of tourists is analysed. Since there are hardly any numbers about museum visits of tourists, the number of hotel stays by tourists is used for this analysis. Apart from an analysis of price and demand for museums in general, also an analysis is done for visual art museums. In 1997 the CBS rearranged its statistics what basically resulted in a shift of museums in the category of mixed collections to the category of visual art. To make sure this fraction would not result in a spurious analysis, these two categories are merged for the whole period. Data about visit numbers of visual art museums was available for the whole period, but data concerning the entrance fees was available for only five years. To give an indication about the development of price and demand for visual art museums, the missing years are calculated by interpolating the values. This method is not ideal since it is less reliable to estimate the price elasticity when using estimated numbers. Nevertheless, this method is applied to give a slight indication about the developments for visual art museums. This univariate analysis contains principally descriptive statistics to explore the variables, and gives insights in the development of price and demand (Seale, 2006: 324-329). These data were predominantly available at statline (<http://statline.cbs.nl>), the Internet databank of CBS.

¹¹ The data of 2005 will probably be published in the beginning of July 2007. For an analysis of supply and demand and an estimate of the price elasticity for the period to 2005 the forthcoming report of Ape can be examined. This report will be published around the end of August.

Time series from previous years are obtained from public annual reports from the CBS and through internal statistics of the CBS.¹²

7.2.3 Multivariate analysis

The second step that is practised is a multivariate analysis. This analysis is utilised with another statistical program, namely Time Series Processor (TSP). This program is uppermost capable in making time series analysis and therefore the price elasticity is estimated by programming the formula into TSP (Hall and Cummins, 2006: 47-66). The multivariate analysis is applied to estimate price elasticity of demand for both the short-term and the long-term. The price elasticity is estimated on a macro level. Firstly, an estimate is done for the whole museum sector in the Netherlands. Secondly, the intention was to make a distinction between visual art museums and museums in general, but the data for visual art museums were not available for all periods so the estimation is not made. As explained in chapter 4 estimating price elasticities in the field of cultural economics is done differently than described in micro economic textbooks. The commonly used method is to estimate the derived demand function. Within this derived demand function the demand for a specific period is clarified by several determinants. An advantage of using the derived demand function to estimate the price elasticity is that this function takes into account different factors influencing demand. One of the determinants is available income. Since the consumer theory states that demand is restricted by income, this factor is needed to estimate the demand function. The available income of families is divided by the population index to correct this index for population growth. Another determinant, which according to the consumer theory influences demand, is the price of substitutes. Besides these determinants the mean entrance fee is used. All price variables are divided by the CPI. As explained in the previous section the index of foreign hotel guests is also used in this analysis. This variable is included in the analysis since tourists visit several museums during their holiday. At last an effect of habit persistence is used for the estimation. To indicate this, a lagged variable of the number of visitors is used to estimate the demand function. To calculate the demand function all numbers are transferred into index numbers. A double logarithmic function is applied as well to avoid big influences of data that fluctuate heavily.

To estimate the demand function an Ordinary Least Squares (OLS) method is applied to do the multiple regressions, this method is also commonly used (Goudriaan, 1984: 2-5). The prices used in this method are all corrected by the inflationary tendency.

¹² For a complete overview of the sources that are used see the section 'sources'.

The formula of the derived demand function can be written as follow:

$$\log B = a + b \log Y + c \log P_s + d \log P + e \log T + f \log B_{-1}$$

B	Visitors index divided by the population index
Y	Available income index of families divided by the population index and the CPI
P _s	Index of prices of substitutes divided by the CPI
P	Index of the average entrance fee divided by the CPI
T	Index of hotel stays by tourists divided by the population index
B ₋₁	Visitors index, delayed by one year (habit formation)

Since a logarithmic formula is used, the coefficients can be regarded as elasticities immediately.¹³ The calculated value of the entrance fee thus reflects the price elasticity of demand for the short-term (Goudriaan, 1984: 10-17). As explained, the data of the CBS are biannual since 1997. Given that most data is provided yearly, the missing years are interpolated with the use of the biannual data. If interpolating for missing years was not practised, the model could only estimate the price elasticity by using biannual data. In this manner, almost half of the selected data would get lost, but by using the interpolation technique data for three years is added.¹⁴

In view of the fact that economic theory about price elasticity states that there is a difference between short-term and long-term price elasticities the long-term elasticity is also calculated. To calculate to long-term price elasticity the following formula is used:

$$\varepsilon^{LT} = \varepsilon^{ST} / (1 - B_{-1})$$

ε^{LT}	Price elasticity in the long-run
ε^{ST}	Price elasticity in the short-run
B ₋₁	Visitors index, delayed by one year

If the price of a good increases, the demand for that good will probably fall. As explained in chapter 4 the price elasticity in the long-run is larger since consumers need time to react on price changes. Within the period of the price change the demand will not change

¹³ For an argumentation see appendix 2

¹⁴ For further motivation and explanation of the interpolate technique see the results of the analysis in chapter 7.3.3.

dramatically since the consumer needs time to react on this price change. This is for instance also the case when a consumer's income falls. The consumer will not directly change its consuming behaviour, but after some periods the consumer is forced to do so. Just like with the change in income, the change in price will have a bigger effect in the following period. During the years the effect of this price change will be smaller. The formula to estimate long-term price elasticity is a geometrical series of effects of that price change. For the period t^1 the effect of the price change is calculated. In the following period the effect of this price change is shown as decrease or increase in demand. Since the formula uses a lagged variable of demand the effect of the price change is visible in following periods. This geometrical series continues over a long period. How long it exactly continues depends on the value of the lagged variable. The variable habit formation is used in this formula because it affects how consumers react on price changes. The value of the long-term price elasticity is the final outcome of this geometrical series.¹⁵

Within the OLS method Pearson coefficient of determination (R^2) is also calculated to indicate if the association between the variables is valid (Seale, 2006: 333-335). R^2 is a coefficient that represents the proportion of the variance that is explained by the independent variable. In this case R^2 can tell something about how demand (dependent variable) is determined by factors as price, income and prices of substitutes (Kennedy, 2003: 14-15). Apart from this statistic Durbin's h is calculated, normally the Durbin-Watson statistic would be applied, but since there is a lagged value involved (habit formation) the Durbin-Watson test is no longer appropriate. The Durbin's h statistic tests, like the Durbin-Watson statistic, the autocorrelation between variables (Kennedy, 2003: 149).

7.3 Analyses

7.3.1 Prices

As explained in the previous part the price does not only include the entrance fee of a museum. This analysis focuses also on more aspects of price, like the available income, CPI, and the prices of substitutes.

To calculate the entrance fee the earnings out of ticket sales are divided through the number of visits. In this way the average entrance fee could be calculated. This kind of calculation is used so museums with more visitors will have a higher weight than small museums. This method is also used by several other scientists, for instance by Luksetich and Lange (1995) who calculated the price elasticity for orchestra demand. In figure 7.1 the development of the entrance fee in combination with other prices is shown. The

¹⁵ For a more illustrative explanation for this method see paragraph 7.3.4.

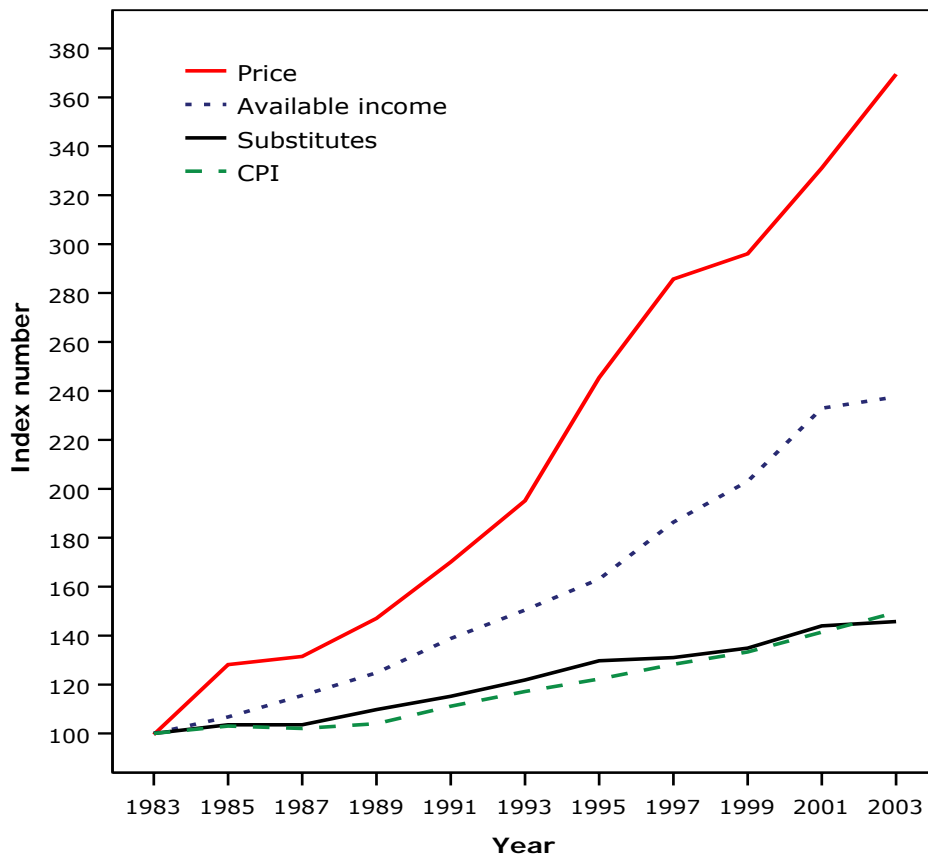
entrance fee of museums in general is represented by the red line. Figure 7.1 shows four periods wherein this did line expand. The first period is between 1983 and 1985, within this period the entrance fee increased with 30%. Until 1987 the entrance fee remains constant, but in the period of 1987-1993 the admission fee did rise with 60 percentage points. The consecutive period (1993-1997) shows another increase of almost 100 percentage points. After this huge increase the entrance fee remains quite stable, nevertheless the ticket price again increased in the last period (1999-2003) with 30 percentage points. The development of the entrance fee shows an increase in ticket price of almost 300% in twenty years, which is an average increase of 6.7% per year.

Next to the entrance fee the available income is analysed. The available income of a household is the income that can be spend after tax deductions (www.cbs.nl). The index of available income increased relatively steady in the period of 1983-1999. The total increase in this period was around 90%. The following period (1999-2001) shows a rather fast increase of 30 percentage points, but this increase stagnated in the last period. The available income increased with 138% in the whole period, which is a yearly increase of 4.4%. The available income thus increases less rapidly than the entrance fee of museums, which suggests that in 2003 museum visitors would have to spend a larger part of their income to museum tickets than in 1983.

Next the development of the CPI, the consumer price index, is analysed. The CPI shows the average price change of goods and services a household consumes (www.cbs.nl). This price index is also taken into account to measure if the prices of museum tickets increased more rapidly than prices for other goods. Just like the index of available income the CPI increased constantly. Within the first few years (1983-1989) the index hardly increased (5%). In the following period the increase is larger, between 1989 and 2003 the CPI increased with 45 percentage points. The CPI did not increase as fast as the available income and the entrance fee of museums. The total increase was 53% in the period of 1983-2003, yearly the increase was 2.2%.

Additionally the prices of substitutes are examined. These prices reflect an index of services of recreational and cultural activities. This index is published by the CBS. This index shows the development of prices of goods and services in the cultural and recreational area. This index shows nearly the same pattern as the development of the CPI. The total increase was 45%, and the index increased annually with 1.9%.

Figure 7.1: *Price index of museums, CPI, available income of household and prices of substitutes in the Netherlands 1983-2003^a.*



^a: Index numbers 1983=100

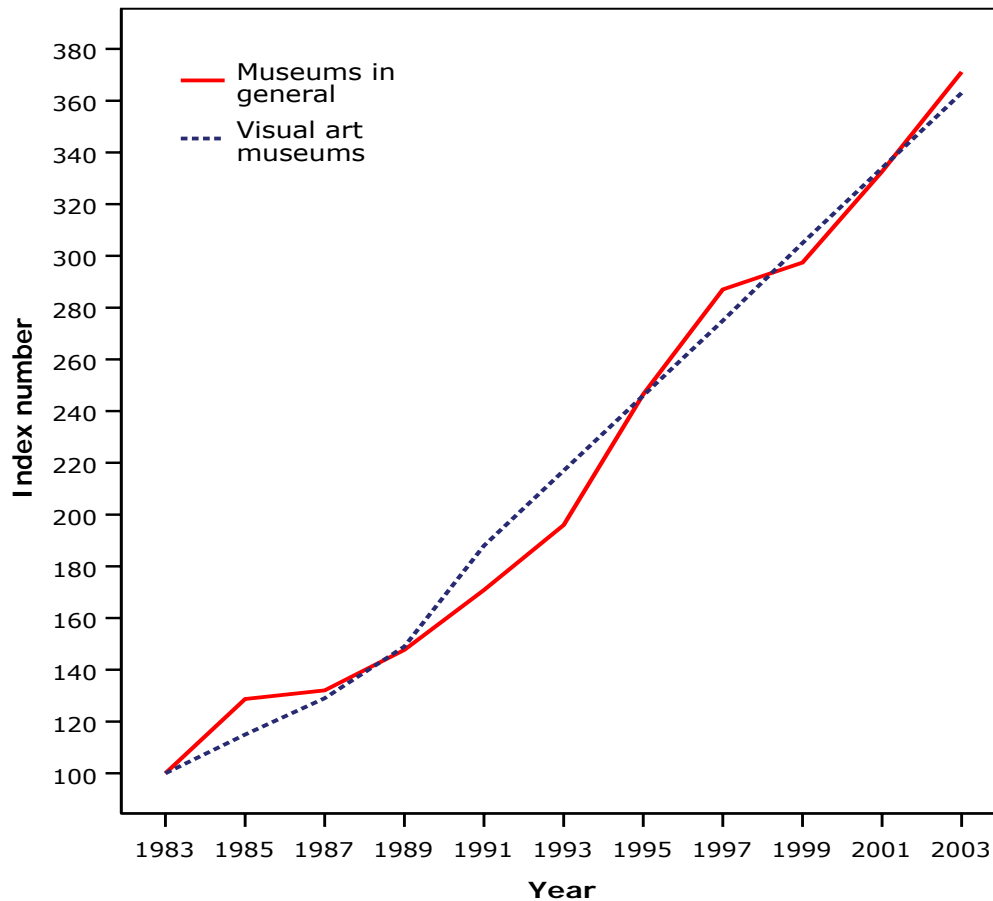
Source: CBS (own calculations).

Visual art museums

As described in paragraph 7.2 hardly any data was available about the entrance fees of visual art museums. Therefore the data for missing years is interpolated, so the development of entrance fees of visual art museums in comparison to museums in general can be shown. Since many numbers are interpolated no concrete assumptions can be made about the numbers in figure 7.2, this figure functions only to give a slight indication. The index of the price of visual art museums did develop itself almost the same as the index of the price of museums in general. The model forecasted that between 1983 and 2003 the entrance fee for visual art museums did increase with 263%. The entrance fee of visual arts museums did increase with 6.6% per year, while the annually increase in ticket price of museums in general was 6.7%. However the entrance fee of visual art museums did not rise faster than the fee for museums in general, but the entrance fee for visual art museums was higher. In 1989 the average

entrance fee for visual art museums was €1.34 while the entrance fee for museums in general was €1.17.¹⁶

Figure 7.2: *Price index of museums in general and visual art museums in the Netherlands 1983-2003^a.*



^a: Index numbers 1983=100

Source: CBS (own calculations).

7.3.2 Demand

Apart from the entrance fee and other prices demand for museums is analysed. Demand for museums is represented as the number of visits. It is important to notice that demand is not represented as number of visitors, since a visitor can bring several visits. Besides that, an overview is given of the population growth in the Netherlands. At last an overview is given of the development of the number of museums in the Netherlands.

¹⁶ Data about the entrance fee of visual art museums were available for this year.

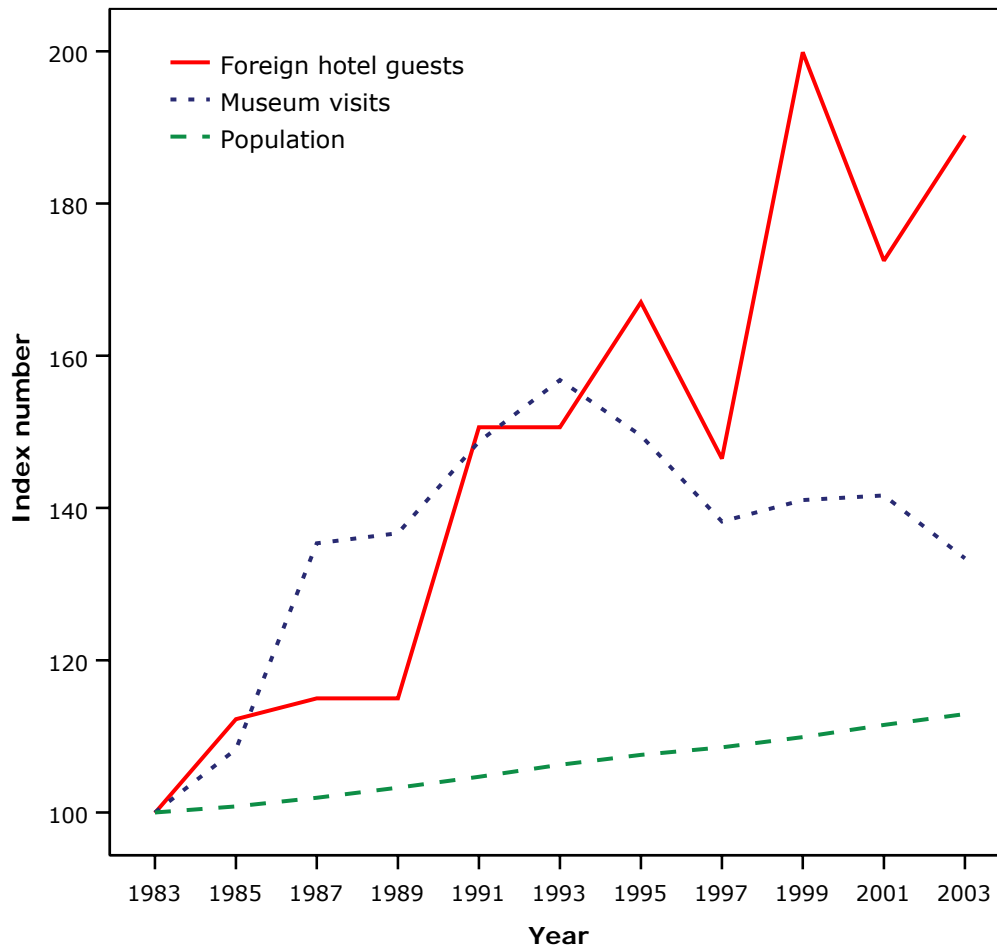
Museum demand

Figure 7.3 shows the development of demand for museums. The blue dotted line represents museum demand. The figure shows three periods of increase in demand. In the first period (1983-1985) the demand for museums increased with 10%. The following period (1985-1987) shows a higher increase in demand of 25 percentage points. From 1987 until 1989 the demand for museums in the Netherlands was stable, but in the period 1989-1993 another increase in demand occurred. The demand for museums increased with almost 20 percentage points in this period. After 1993 the demand for museums decreased. In the period 1993-1997 the demand decreased with nearly 20 percentage points and the demand for museums was at the same level as in 1989. Between 1997 and 2001 there was a minuscule increase in demand (4 percentage points), but in the last period the demand decreased again with 8 percentage points. However the last periods shows a pattern of declining demand, the demand did increase over the whole period with 30% which is an annually increase of 1.4%.

Next to museum demand the population growth is analysed, which is shown in figure 7.3 by the green striped line. This line is constantly rising. The increase in population is small, the population increased with 13% over the whole period, which is an annually increase of 0.6%. There are no large fluctuations visible in this trend.

The third variable that is analysed is the index of foreign hotel guests. This variable is represented by the red line, and increased faster than the other variables. The line shows several periods of increase. The two biggest increases took place between 1987 and 1989 (40 percentage points) and between 1997 and 1999 (50 percentage points). Until 1993 the foreign hotel guest index did not expand more rapidly than the visit index, but after 1993 there was a big difference. Next to periods of increases also two periods of decrease in the index are shown. Between 1995 and 1997 the amount of foreign hotel visitors decreased with 20 percentage points, this is the same for the period 1999 -2001. In total the index increased with 89%, which is a yearly increase of 3.2%. This index shows the largest expansion of all indexes in the figure.

Figure 7.3: *Index of museum visits, population growth, and foreign hotel guests in the Netherlands 1983-2003^a.*



^a: Index numbers 1983=100

Source: CBS (own calculations).

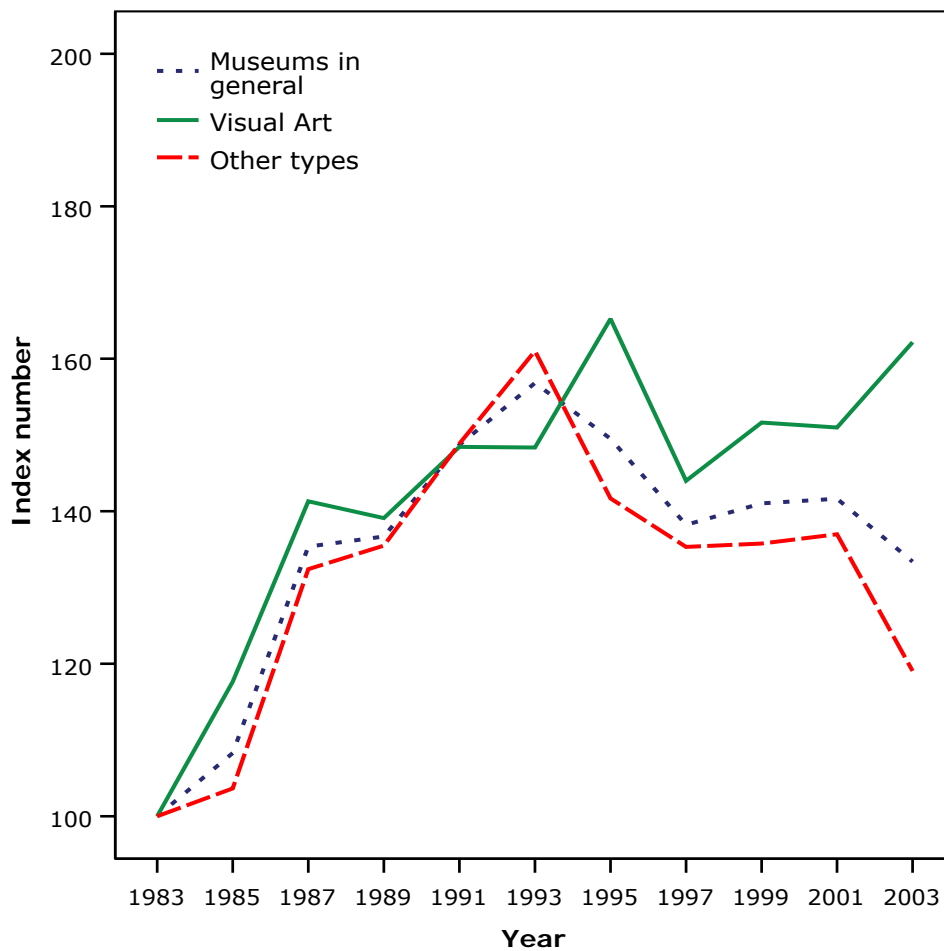
Type of collection

As explained in paragraph 7.2 the demand for museum is also analysed for different types of museums. Figure 7.4 shows the trend of the demand for museums in general, visual art museums and museums with another type of collection. The development of demand for museums in general is described in the previous part. The line is also shown in figure 7.4 to compare the development of demand for museums with each other. Demand for museums in general is represented as the blue dotted line.

Demand for a visual art museum is visualised as the green line. The data for this type of museum is corrected since the CBS changed its statistics and more museums belong to the group of visual art museums since 1997. This is corrected by merging the categories of museums with mixed collections and museums with a visual art collection, since the fraction comes down on a shift of museums with mixed collections into the

category of visual art museums. The demand for visual arts museums shows moreover the same trend as for museums in general, however visual art museums generate a higher increase in demand and some developments are situated before or just after they occurred for museums in general. In the period 1983-1987 the demand for visual arts museums increases, just like the demand for museums in general, with 40%. After this increase the line shows a little decrease in the period 1987-1989 of 5 percentage points. In 1989 the demand rises again until 1991 (8 percentage points) the following period the demand remains stable. In 1993 an increase in demand of 15 percentage points takes place. After 1995 the demand falls with 20 percentage points. After this decrease the demand for visual art museum is rising again. In the period 1997-2003 the demand increases with 15 percentage points. Over the whole period the demand for visual art museums increased with 60%, which is an annually increase of 2.3%.

The demand for other types of museums (history museums, nature museums, technical museums etc.) is pictured as the red striped line. The trend of this line is pretty similar with the line of museums in general. In the same periods ups and downs are visible; nevertheless the proportion of these ups and downs is not the same. The demand for other types of museums has two main peaks. The first period of increase is between 1983 and 1987, in this period the demand increases with 30%. In the next period the demand keeps on rising until 1993, similar to the development of demand for museums in general. The demand increased with 30 percentage points in this period. After 1993 a decrease in demand takes place. In the period 1993-1997 the demand for other types of museums decreases again with 30 percentage points, so the demand faces the same level as in 1989. The subsequent period (1997-2001) shows a stable demand, but in 2001-2003 the demand falls with 20 percentage points. Despite of the huge increases in demand in the first periods, the demand for other types of museums increased only with 19% in the period 1983-2003. Just like museums in general the demand declines in the past years, however the demand for other types of museums declines faster than the demand for museums in general since the demand for visual art museums grows. The total increase in the demand for other types of museums in the period 1983-2003 was 19%; annually there was an increase of 0.9%.

Figure 7.4: *Index of museum visits by type of collection in the Netherlands 1983-2003^a.*

^a: Index numbers 1983=100

Source: CBS (own calculations).

7.3.3 Price elasticity

After analysing price and demand the derived demand function is estimated. The outcomes for the price variable in the derived demand function can be regarded as the short-term price elasticity. The long-term price elasticity is calculated with another formula, which is shown in chapter 7.2. Figure 7.5 shows both short-term and long-term price elasticity of demand for museums in the Netherlands.¹⁷ The price elasticity is estimated for the period 1984-2003. 1983 is not included in the analyses since a lagged variable is included.

¹⁷ The outcome of the derived demand function is shown in appendix II.

Figure 7.5: *Price elasticities of museum demand in the Netherlands 1984-2003.*

Short-term elasticity	Long-term elasticity	R ²	Durbin's h
0.24	0.52	0.91	0.69

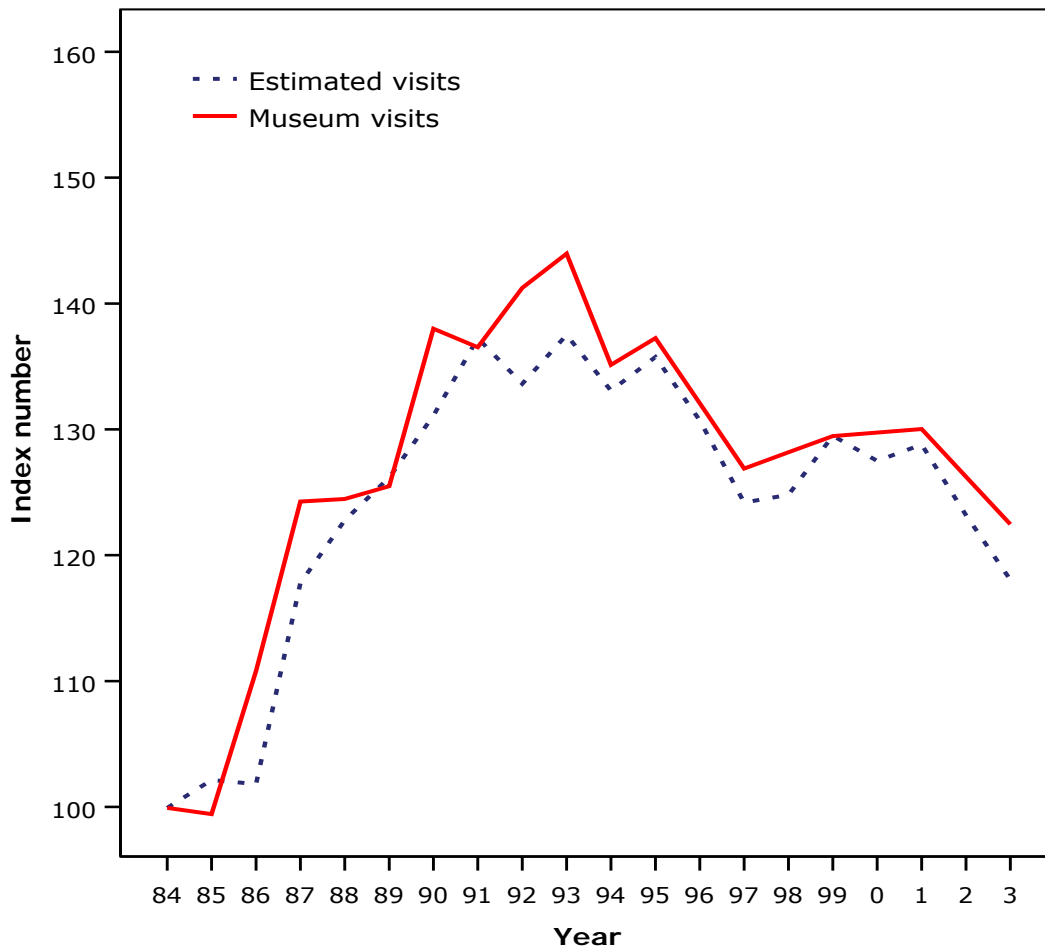
The results of the derived demand function for museums in general are satisfying since the derived demand function is able to reproduce 91% of the variance in museum visits within the period of 1983 -2003. In figure 7.6 this is also shown, this figure shows the development of the estimated visits and the real visits. In addition, Durbin's h statistic is sustainable and the elasticities are significant.¹⁸ Visitors of museums have a short-term price elasticity of 0.24. Every 10% increase in ticket price thus results in a 2.4% decrease in visits. The short-term price elasticity is inelastic, so museum visitors in general do not respond heavily on price changes in the short-run. In the long-run the price elasticity is estimated to be 0.52.¹⁹ In the long-run museum visitors will reduce their visits with 5.2% if the price increases with 10%.

As explained in paragraph 7.2 the data for missing years is estimated by using interpolation. To check if the model estimates the derived demand function properly, the demand function is also estimated for the period 1983-1997. Within this period all data are available. The price elasticity for this period remains relatively the same (0.25 for the short-run and 0.48 for the long-run) and R² also gives the same value (0.91). The values estimated by the derived demand function for the years 1999, 2001 and 2003 barely differ from the real observed values.²⁰ Therefore it can be assumed that there are hardly any differences between the interpolated values and the actual values.

¹⁸ At a 0.05 level.

¹⁹ $0.52 = 0.24 / (1 - 0.54)$

²⁰ The derived demand function estimates the measured value with an error of 6% (1999), 5% (2001) and 7% (2003).

Figure 7.6: *Real and estimated museum visits in the Netherlands 1984-2003^a*

^a: Index numbers 1984=100

Source: CBS (own calculations).

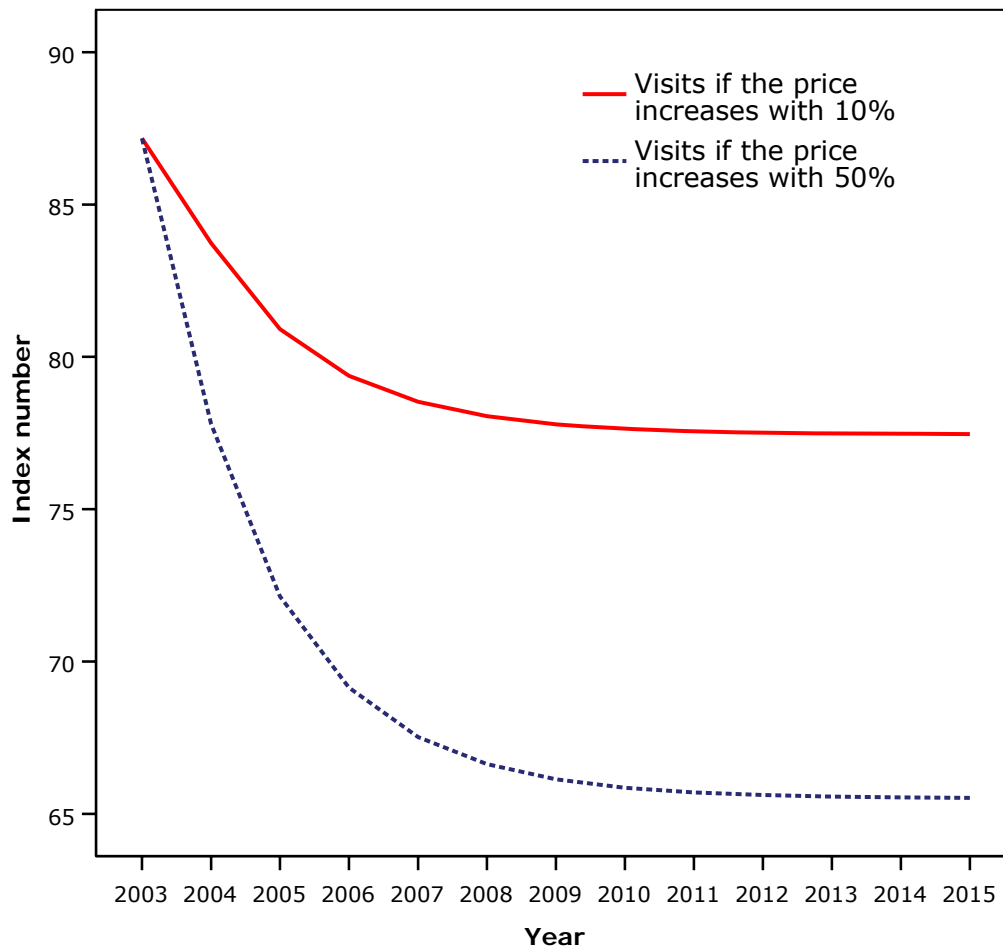
7.3.4 Predictions for the future

In paragraph 7.2.2 is explained how the long-term price elasticity is estimated. Within this subsection some predictions are made to visualise this technical story. It is assumed that if the price of a museum ticket increases that this has an effect on the visits in the following periods. With the use of the estimated model a prediction is done about the influence of a price change in 2004 on the demand. In figure 7.7 this prediction is shown. Within this prediction it is assumed that the price did increase with 10% in 2004 (red line) and that the price increased with 50% in 2004 (blue dotted line)²¹; within this model all other variables remain constant. The lines in figure 7.7 show the effects of this increase in price on the visits. Both lines show a decrease in visits, the blue dotted line declines the fastest since the price change is the biggest. The figure shows that a price change influences the visits in large period. The bigger the increase in price is, the larger

²¹ Since 2003 is the last available year, the visits are predicted for the subsequent period.

the effect is. If the price elasticity is calculated for the short-term, the change in price and demand for the following year is taken into account. The long-term price elasticity takes into account the changes in demand for a much longer period. This period ends when there is no change in demand to observe anymore. The lines in figure 7.7 show that this change in demand can last for a long period. The differences between years become smaller, but there is still an effect of the price change to observe.

Figure 7.7: *Predicted museum visits in the Netherlands 200-2015^a*



^a: Index numbers 1990=100

7.4 Results

After analysing the entrance fees, demand and both short-term and long-term price elasticity of demand for different types of museums, the first three hypotheses can be answered.

Hypothesis one was posed as follow:

Museums have both an inelastic short-term and long-term price elasticity, whereby the long-term elasticity is larger than the short-term elasticity is.

Before estimating the price elasticity the development of the entrance fee of museums is analysed. The entrance fee did rise with an average of 6.7% per year. Some periods had major increases while other periods faced only small increases, which resulted in a total increase of 300% in the period 1983-2003. The available income of inhabitant of the Netherlands did not rise that fast. The yearly increase was 4.4% and in total the increase was 140%. Museum visitors thus had to spend a greater part of their income on museum tickets. Also CPI is analysed to conclude of the entrance fees did rise faster or slower than the inflation index. The entrance fee did rise much faster than the CPI. The CPI did increase with 50% over the whole period with annually increase of 2.2% and the index of substitutes shows practically the same pattern (1.9%). Prices of museum tickets thus did rise more rapidly than the available income, the prices of substitutes, and the CPI.

According to micro economic theories demand will fall if price increases. This does not count for museum demand. The demand for museums did increase over the last twenty years with 30% (annually 1.4%). However, since 1993 the demand was declining. The population of the Netherlands did also increase; this increase had a steady development and was around 0.6% per year. At last the index of foreign hotel guests is analysed. The index of this group increased with 150%, but in this case a decline was also visible ever since 1999.

The price elasticity is estimated by applying a derived demand function wherein the previous discussed variables are used. The price elasticity of museums in the short-run is 0.24, which is an inelastic elasticity of demand. On the long-run the elasticity is doubled (0.52), which suggests that it takes some time to measure the effect of price changes. The hypothesis can be verified. Both elasticities are inelastic and the short-term elasticity is smaller than the long-run elasticity.

The second hypothesis makes a statement about the trend in price elasticity.

The price elasticity of museum demand does not differ among countries and across periods.

In chapter 4 a few surveys about price elasticity of museum demand are discussed. Within these surveys the short-term price elasticities of museum demand are between 0.12 and 0.26. One survey (Darnell et. al. 1990) estimates a price elasticity of 0.54, which is significantly higher than the other ones. The price elasticity estimated in the previous sub-section (0.24) is comparable with the elasticities found in previous surveys.

The long-term price elasticity, which is even fewer estimated than the short-term elasticity, also corresponds with outcomes of other surveys. In each survey the long-term price elasticity approximately doubles the short-term elasticity, which is also the case in this thesis. The first survey discussed in chapter four was done in 1984 and the last one dates back from 1998. Over time there are hardly differences and also the country seems to be irrelevant. Another aspect seems to have more influence in differences of price elasticity of demand, namely the type of collection. Darnell et. al. (1990) estimated a price elasticity of 0.54, probably due to the nature of the collection of the museum. The museum that is analysed in the research is an open air museum where visitors can experience the daily life during the 19th century. Therefore it faces more competition of other activities and visitors will be more sensitive to price changes. Another survey of Darnell et al. (1998) shows almost the same results as this survey, in spite of the fact that this survey is done in another country (Great Britain) and almost ten years ago. The hypothesis thus can be verified and the answer of the next hypothesis will possibly give more insight in the differences that probably will exist in price elasticities of museum demand.

The third hypothesis focuses on the differences between visual art museums and other types of museums.

Visual art museums will have a smaller elasticity of demand than other types of museums.

The development of visits to visual art museums shows another pattern than for museums in general. In 1993 a decline in visits of museums in general started off. This decline continued and the visits did not show any signs of stabilisation. For visual art museums a decline in visits started off in 1995, in contradiction to visits of museums in general the visits of visual art museums did increase again in the period 1997-2003. The visits of visual art museums did increase more rapidly than visits of museums in general. Apart from the visits an indication is given about the development of the entrance fee. Since the data are mainly forecasted based on five previous years, no solid conclusions can be made. The forecasted model shows an almost equal development of prices of visual art museums as for museums in general. The ticket price for a visual art museum is higher than for museums in general. Visual art museums therefore face nearly the same pattern in development of prices as museums in general, but the visits increased far more rapidly. Since the price elasticity for visual art museums is not estimated, the hypothesis cannot be verified or falsified. However, the development of price and demand indicates that visitors of visual art museums are less sensitive to price changes than visitors of museums in general are, since the price development of both museum

types remains nearly the same but the development of the demand for these types of museums differs from each other. Visual art museums do face a larger increase in demand than museum in general. Given that the price variable is not based on 'real' values only, no hard conclusions can be made about this development.

7.5 Conclusion

Within this chapter the development of entrance fees and demand for museums is analysed. Attention is paid to museums in general and visual art museums as a separate group. The analysis of the entrance fee shows that this fee did increase over the past period (1983-2003). In spite of this increase in price the visits did not decline. In comparison with 1983 there is even an increase, but it is the case that there is a decline in visits since 1993. Because of this small effect of the change in price on demand the price elasticity is inelastic. The short-term elasticity is 0.24 and the long-term elasticity is 0.52, which is in line with the theory of Katz and Rosen. Since both long-term and short-term price elasticity are inelastic the first hypothesis can be verified.²² Also the second hypothesis, concerning changes among countries and time, can be verified. The country where and the time when the price elasticity is estimated does not seem to matter, on the contrary the type of museum does seem to make a difference in price elasticity. This difference was supposed to be tested in the third hypothesis wherein the price elasticity of visual art museums would be estimated. Since not all the data was available the price elasticity could not be calculated. Therefore this third hypothesis cannot be verified or falsified. Nevertheless the analysis of price and demand indicates that the public of visual art museums is less sensitive to price changes than museum visitors in general are.

²² The price elasticity of demand is inelastic if the value is smaller than one.

8 Discriminant analysis

8.1 Introduction

Within this chapter the analysis of socio-economic factors is discussed. The results of the analysis show which variable influences demand to the greatest extent. The chapter starts with presenting the population and period and the data collection methods that are used. In the second part the different factors of demand are analysed and the fourth and fifth hypotheses are answered. At last some concluding remarks are made.

8.2 Data collection methods

Within this paragraph the population and the research period are presented. Also the sources that are used and the way the data is selected is explained.

8.2.1 Population and period

The population of this survey encompasses inhabitants of the Netherlands involved with the facility use survey (AVO) by the Social Cultural Planning Office (SCP). Within this survey, which is practised every four years, the Dutch population is questioned about their facility use. A part of this survey includes a broad cultural section, which is used for this analysis. Furthermore the data from this survey enclose information about age, gender, education, income, and social background. Almost 12,000 respondents are involved in this survey; the respondents that are selected for the analysis are persons above the age of eighteen. Persons below eighteen are removed from the dataset since this group did not finish their education yet and has no income yet. Besides that it is hard to analyse the influence of someone's upbringing when the person is still an adolescent. The choice for a population research instead of a visitors survey is based on the fact that a population research also contains facts about non-visitors. Information about non-visitors is necessary to analyse the differences between museums visitors and non-visitors. Most studies on determinants of demand only focus on current visitors. According to Kirchberg there is a mistaken belief that the results from visitors surveys can be generalised for the whole population. Kirchberg furthermore claims there is a need for population surveys so visitors and non-visitors can be compared with each other (Kirchberg, 1996: 241). This thesis thus intentionally analyses socio-economic factors of non-visitors and visitors for the reason that this makes it possible to compare visitors and non-visitors with each other, and to reveal which factors distinguish visitors from non-visitors. Next to that advantage, this population survey is done by a professional agency (SCP), which makes the data more reliable. Another advantage of the AVO research is that this research is done every four years and that the respondents are

divided over the Netherlands. Most studies on socio-economic factors of visitors only focus on some singular museums, which make it hard to generalise the results for the whole population (Kirchberg, 1996: 241). This thesis tends to add something to previous studies since it does analyse museum demand for a whole population and for different time periods. The data are analysed for 1995 and 2003. Previous years were not useful because the data were not specified enough. Besides that, the AVO research in the years before 1995 is carried out by a different agency than in 1995. Since 1995 a different procedure is used which results in a higher response rate (de Haan, 1997: 11).

8.2.2 Sources and selection

To analyse the socio-economic factors that influence demand two sources are used. Firstly the AVO research is used, which, as explained in the previous sub-section, reflects the facility use of the Dutch population. The data are collected through the Data Archiving Networked Services (DANS) databank (www.DANS.nl). DANS administers data files of the Dutch Historical Archive, the Steinmetz archive, the Scientific Statistical Agency and the e-depot of the Dutch Archaeologists. The data can be accessed by subscribing to the website. Through the archive the data can be transported to a SPSS file easily. Since the AVO data do not provide price information, another source is used next to the AVO data. To analyse the different costs consumers face during their museum visit the CBS statistics are used. The CBS surveys the costs consumers make during day trips every four or five years. The concept of a day trip is quite broad since a two hour trip is already counted as a day trip. These data are available through statline (<http://statline.cbs.nl>), the website of the CBS where several data can be downloaded in the form of an excel sheet. The data in this excel sheet are transported to a SPSS data sheet.

To test the last two hypotheses several variables are used. Price is already analysed in the previous chapter. Nevertheless the total costs a consumer encloses during a visit are analysed within this chapter. Another economic determinant of demand is income, income is easy to analyse since the income per month per respondent is available in the AVO data. The available time of people is harder to analyse. Since the time spend per visit is not available the kind of occupation, the type of household and the age of the children is examined. This decision is based on previous surveys that show that these factors influence the time someone has available. De Haan and Kirchberg for instance state that parents with young children and jobs do not have a lot of spare time available (de Haan, 1997: 41 and Kirchberg, 1996: 249). Kirchberg also notices that the kind of occupation and the kind of household can influence the demand for museums (Kirchberg, 1996: 249-251). Education and upbringing are analysed through several variables. First the type of education the respondent finished is analysed. Secondly the type of education

his or her parents finished is explored. Also the participation in cultural activities is used to examine this determinant of demand. At last social environment is analysed by the membership of cultural associations and the participation in cultural associations. These memberships are indicators for the kind of social environment since people tend to enrol in certain groups, so they obtain a certain status. By being a member of a cultural organisation people show that they want to belong to this cultural orientated group and want to acquire status from this group. These variables are used to answer the hypothesis concerning the influence of the different socio-economic factors on museum demand.

After collecting the data the files are cleaned, besides that missing items are removed and some data are aggregated. After these procedures, variables concerning 9,000 respondents are used for the analysis. At first a univariate analysis is done to explore the variables, which are described before. This is a descriptive analysis so each variable can be explored individually. Secondly, several variables are recoded to do a multivariate analysis²³ (Seale, 2006:346-348). To examine which socio-economic factors determine museum demand, a discriminant analysis is practised. In contradiction to correlation or association analysis, which is used in the multivariate analysis in the previous chapter, the discriminant analysis does not give clarification about the relation between the variable but enables the researcher to differentiate which variables determine the membership to a certain group, in this case museum visitors (Huberty and Olejnik, 2006: 85-100). This analysis is applied in a stepwise method to investigate which socio-economic factors distinguish visitors from non-visitors. This way the variables (socio-economic factors) that influence participation in culture predominantly can be distinguished (Goudriaan, 1985: 41-42). Within this discriminant analysis, only variables that satisfy the criteria of this analysis are analysed. The standardised discriminant function shows to which extent the variables differentiate visitors from non-visitors. The variable with the highest score is the most important variable. Apart from the discriminant functions, other results are shown in the discriminant analysis. The canonical correlation shows the relation between the variables. This correlation coefficient shows the linear combination that is correlated in the greatest extent with the explanatory variables (Kennedy, 2003: 171). If the value for this correlation is higher than 0.37 the discriminant functions can be used. The canonical correlation shows the variance that is explained by the different variables. Further the group centroids are given. These centroids show for which grouping variable the discriminant functions are valid. In this case, the grouping variables are visitors or non-visitors. The discriminant functions relate to the group with highest centroids (Huberty and Olejnik, 2006: 85-100).

²³ In what way they are recoded is shown in appendix III.

At last the correct classification is estimated. The value of this classification shows which cases can be classified in the right class based on the discriminant functions. This classification thus shows which percentage of the respondents can be defined as museum visitors based on the discriminant functions of the variables (van der Vocht, 2007: 161-162).

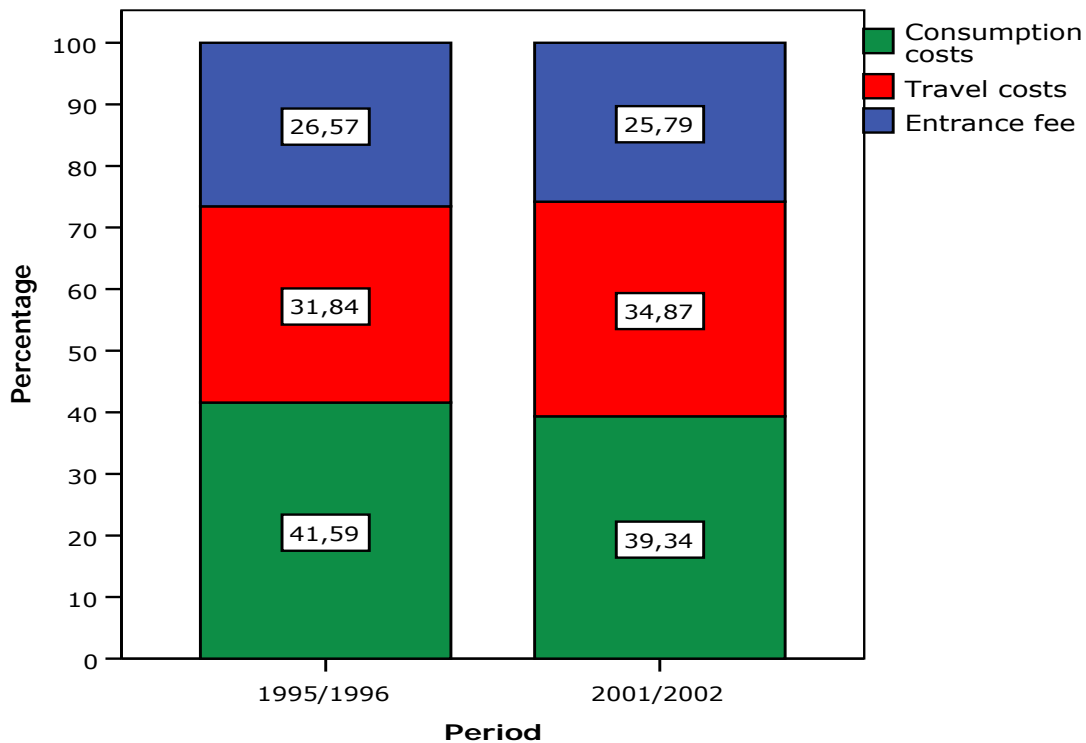
8.3 Analyses

In this sub-section the variables are analysed. The first five sub-sections focus on the variables individually. The last sub-section consists of a multivariate analysis.

8.3.1 Costs

Three aspects of costs that a consumer encompasses during a museum visit are the entrance fee, transportation costs and consumption costs. In the previous chapter an overview is given about the entrance fee. Since museum visits include more costs than the admission fee only it is important to analyse these other costs too. The total costs of a museum visit did rise over the last twenty years. These costs reflect the average costs consumers encompass when visiting a museum in the Netherlands, and are corrected by the inflationary tendency. The average entrance fee was €2.67 in 1995/1996. This amount increased to €3.75 in 2001/2002. As presented in figure 8.1 the entrance fee is just 25% of the total costs, which stayed almost the same in the following period. The consumption costs cover the widest area. These costs are around 40% of the total costs. In 1995/1996 the consumption costs were €4.18 and in 2003 €5.72. The consumption costs did increase, but the share of the total cost decreased in 2001/2002. The last cost item is the transportation costs. These costs cover about 32% of the total costs in 1995/1996. This increased to a share of 35%, in 1995 these costs were €3.20 and in 2001/2002 €5.02. The total costs did rise over the years, but the share of the costs stayed nearly the same.

Figure 8.1: *Different cost items of a museum visit in the Netherlands in 1995/1996 and 2001/2002.*



Source: CBS (own calculations).

8.3.2 Demand

Museum demand is analysed both in 1995 and in 2003. In 1995 33.7% of the respondents visited a museum. Only 17.1% of the respondents visited a visual art museum. However 50.1% of the museum visitors are people that visited a visual art museum. In 2003 the percentage of visitors decreased, 30.8% of the respondents visited a museum. This percentage decreased with 2.9 percentage points in comparison to 1995. This trend is shown in paragraph 7.3.2 as well. Therein is shown that between 1995 and 2003 the demand decreased with 15 percentage points. The number of people that visited a visual art museum increased in comparison to 1995. In 2003 20.3% of the respondents visit a visual art museum; this is 3.2 percentage points more than in 1995. 65.9% of the museum visitors visited a visual art museum. This trend is not shown in paragraph 7.3.2. The statistics of the CBS show a moreover equal demand in 1995 and 2003. A cause for this difference can be that respondents of the AVO research did visit more visual art museum but that visual art museums in total did not all attract more visitors. This difference can also be caused by the fact that the AVO survey is a population survey, and the CBS research is a visitors survey.

8.3.3 Income

The second variable is income, which is earned income (salary or profit) and unearned income (like an unemployment benefit). Since the income is analysed over two years the income is corrected by the inflationary tendency. In 1995 a non-visitor had an average income of €3390 per month. The income of a museum visitor was higher, namely €3640 per month. A visitor of a visual art museum had the highest income per month; their income was €4378 per month. In 2003 the income did rise with a few percents for all categories, and the distribution remained the same. The income of non-visitors was still the lowest and did rise in comparison to 1995 with 4%. Visitors of museums in general had the biggest increase in income, namely 5%. Although visitors of visual art museums still had the highest income, their income did rise the slowest (3%).

8.3.4 Available time

How much time consumers had available to visit a museum is derived from the type of household, the number of children and the job they have. Figure 8.2 shows the type of household of a museum visitor and a non-visitor. In 1995 non-visitors mostly had a partner and children (47.8%). 25.7% was a part of a couple without children and 13.3% lived alone. The largest part of museum visitors were also couples with children, however this part was smaller than for non-visitors (41.9%). The second category, couples, shows the same score as for non-visitors, but museum visitors were more often single (18.1%). Visitors of visual art museums were less unequally divided. 33.6% was a couple with children, 26.8% was a couple without children, and 23.1% was single. In 2003 museum visitors and non-visitors were more spread over the categories. There was a shift from visitors and non-visitors from a couple with children to a single with children, a single and no family household. For visitors of visual art museums the situation also changed. There was a shift from visitors that are a couple with children to a couple without children. In addition, a single parent was more represented in this group.

Figure 8.2: *Museum visitors by household situation in the Netherlands in 1995 and 2003.*

	1995			2003		
	Non visitors	Museum visitors	Visitors visual art	Non-visitors	Museum visitors	Visitors visual art
1 person	13.3%	18.1%	23.1%	16.8%	20.7%	23.8%
No family household	7.5%	9.8%	11.3%	10.1%	10.8%	11.5%
Couple	25.7%	25.7%	26.8%	26.5%	29.3%	32.8%
Couple with children	47.8%	41.9%	33.6%	37.2%	31.7%	24.9%
I parent and children	5.3%	4.3%	5%	9.1%	7.4%	7%
Multiple families	0.4%	0.1%	0.3%	0.3%	0.1%	0.1%

Source: AVO 1995 and 2003 (own calculations)

The previous figure shows that museum visitors in general did have children. To explore the relation between the ages of the children and museum demand children are split up in three age groups; children from 2-4 years old, children from 5-11 years old and children from 12-30 years old. In figure 8.3 is shown that in 1995 non-visitors were best represented in the category with the youngest children (17.2%) and visitors of visual art museum scored the weakest in this category (9.6%). Generally non-visitors had a bigger part in the categories, but the older the children were, the smaller the differences between visitors and non-visitors. In 2003 the situation did change. Non-visitors were still best represented in all categories, but there was a shift of people with children in the age of 5-11 to people with children in the age 12-30. Visitors of visual art museums were in fewer cases parents of young children and more often parents of elder children. Overall the conclusion can be drawn that museum visitors did not often have young children.

Figure 8.3: *Museum visitors and age of their children in the Netherlands in 1995 and 2003.*

	1995			2003		
	Non visitors	Museum visitors	Visitors visual art	Non-visitors	Museum visitors	Visitors visual art
0 - 4 year	17.2%	12.8%	9.6%	16%	9.5%	7.6%
5 - 11 year	20.6%	20.1%	15.9%	16.7%	18.4%	13%
12 - 30 year	30.8%	30%	26.9%	34.3%	33.9%	32.6%

Source: AVO 1995 and 2003 (own calculations)

Apart from the type of household and the age of the child, the kind of occupation a consumer has, does influence on the time that is available. Since this variable is not available in the 2003 file, this variable is analysed for 1995 only (see figure 8.4). In 1995 most people had a paid employment. Museum visitors were best represented in this category (55.3%). 11.8% of museum visitors was retired, and 11.1% was housewife or houseman. Visitors of visual art museums had almost the same share of retired people in their population as museum visitors in general. It is remarkable that 8% of visual art visitors were student, while this group was in a smaller extent represented by non-visitors and museum visitors in general.

Figure 8.4: *Museum visitors by employment in the Netherlands in 1995.*

	Non-visitors	Museum visitors	Visual art visitors
Paid employment	47.8%	55.3%	54.9%
Independent	4.4%	4.7%	5.5%
Unemployed	10.1%	8%	7.9%
Retired	15%	11.8%	11.3%
Student	4.5%	6.2%	8.2%
Unfit for work	4.2%	2.8%	3.1%
Own household	14%	11.1%	3.7%

Source: AVO 1995 (own calculations)

8.3.5 Education and Upbringing

To measure the factor education and upbringing three variables are used. The first one is education. The type of education that is finished is shown in figure 8.5. The total trend is that the level of education has increased. In 1995 non-visitors were mainly educated on vocational education level (25.3%) or finished primary school (25.1%). Museum visitors did predominantly have a bachelor degree (23.8%) or a secondary vocational education degree (21.2%). Visitors of visual art museum were educated on the highest level.

28.9% had a bachelor degree and 11% a master degree. In 2003 the level rose. 31.3% had a bachelor degree and 19% a master degree. Also the level of education increased for visitors and non-visitors.

Figure 8.5: *Museum demand and type of education in the Netherlands in 1995 and 2003.*

	1995			2003		
	Non-visitors	Museum visitors	Visitors visual art	Non-visitors	Museum visitors	Visitors visual art
No or >lo ²⁴	2.3%	0.6%	0.3%	1.8%	0.4%	0.4%
lo	25.1%	9.9%	6.4%	16.7%	5.4%	3.9%
Lbo/vbo	25.3%	13.0%	8.5%	23.2%	9.8%	6.9%
Mavo/Mulo	11.6%	10.5%	10%	12.8%	10.7%	9.7%
Havo/Vwo/Hbs	6.7%	10.1%	12%	7.4%	11.5%	12.6%
MBO	18.5%	21.2%	17.7%	22.7%	19.5%	16.1%
HBO/ bachelor	8.3%	23.8%	28.9%	11.9%	28.1%	31.3%
WO master	2.3%	11%	16.3%	3.5%	14.7%	19%

Source: AVO 1995 and 2003 (own calculations)

As well as the type of education the respondents finished, also the education of the parents is taken in to account. The level of education of parents is substantially lower than the level of the respondents (see figure 8.6). This is caused by the improved study facilities and possibilities nowadays. In 1995 parents of non-visitors did have the lowest degree of education. 45.3% of the fathers and 51% of the mother only finished the primary school. Parents of museum visitors also scored the highest in that category, but with a lower percentage than non-visitors score (30.7% for fathers and 39.4% for mothers). Parents of visitors of visual art museums scored the highest. Again most parents did only have finished primary school (23.2% and 32.8%), but 10.9% of the fathers also had a master degree. Mothers scored lower than fathers, but higher than mothers from non-visitors or mothers from museum visitors in general. Again mothers were best presented in the category of primary school (32.8%). However the percentage is smaller than for museum visitors and non-visitors.

²⁴ Lo= primary education, lbo/vbo= preparatory vocational education, mavo/mulo= secondary midleschool, havo/vwo/hbs= higher secondary midleschool, MBO=vocational education, HBO= bachelor, WO master= university/master, see also appendix I.

Figure 8.6: *Museum demand and type of education of parents in the Netherlands in 1995.*

	Non-visitors		Museum visitors		Visitors visual art	
	Father	Mother	Father	Mother	Father	Mother
>lo ²⁵	6.2%	6.8%	2.6%	3.2%	2.1%	2.7%
lo	45.3%	51%	30.7%	39.4%	23.2%	32.8%
Lbo/vbo	22.9%	23.2%	21.7%	22.4%	19.8%	20.2%
Mavo/Mulo	8.6%	11.3%	11.1%	15.2%	10.4%	17.2%
Havo/Vwo/Hbs	4%	2.4%	7.7%	6.8%	10.6%	9.2%
MBO	6.7%	3.5%	8.4%	6.6%	9.6%	7.4%
HBO/WO	4.5%	1.6%	10.7%	5.4%	13.5%	8.6%
bachelor						
WO master	1.9%	0.3%	7%	1.1%	10.9%	1.9%

Source AVO 1995 (own calculations).

Figure 8.7 gives an overview about the education of the parents per type of visitor in 2003. The level of education increased a bit but the average level of each group was still primary school. Also fathers still were higher educated than mothers were. Fathers of non-visitors were mostly educated on primary school level (36.2%), mothers even scored higher in this category (40.7%). 23.8% of the fathers and 24% of the mothers did have a secondary vocational education. Parents of museum visitors were educated on a higher level. Although the average level was primary school (23.6% for fathers and 32.7% for mothers). Around 20% of the fathers and mothers did have a secondary vocational education and 12.5% of the fathers did have a bachelor degree. This was much higher than what fathers of non-visitors (6.3%) have. Visitors of visual art museums were in accordance with 1995 educated on the highest level. This group was represented best in the category of primary school as well, but with lower percentages (21.3% for fathers, 30.7% for mothers). Also in the highest category (master degree) parents of visual art visitors were best represented. 10.5% of the fathers of visual art visitors did have a master degree; remarkably this was lower than in 1995. Fathers from non-visitors and museum visitors in general did score higher in comparison to 1995. Mothers of visual art museum visitors were better represented in this category than in 1995. This also counts for mothers in the other categories.

²⁵ Lo= primary education, lbo/vbo= preparatory vocational education, mavo/mulo= secondary midleschool, havo/vwo/hbs= higher secondary midleschool, MBO=vocational education, HBO= bachelor, WO master= university/master, see also appendix I.

Figure 8.7: *Museum demand and type of education of parents in the Netherlands in 2003.*

	Non-visitors		Museum visitors		Visitors visual art	
	Father	Mother	Father	Mother	Father	Mother
>lo ²⁶	5.8%	6.3%	2.9%	2.8%	2%	1.8%
lo	36.2%	40.7%	23.6%	32.7%	21.3%	30.7%
Lbo/vbo	23.8%	24%	20.1%	20.8%	18.1%	19%
Mavo/Mulo	10.6%	15.2%	10.8%	16.8%	10.6%	18.4%
Havo/Vwo/Hbs	4.9%	3.6%	8.4%	7.8%	9.6%	8.8%
MBO	9.4%	5.7%	13%	8.2%	13.2%	8.5%
HBO/WO	6.3%	3.2%	12.5%	8.1%	14.6%	9.9%
bachelor						
WO master	3.1%	0.6%	8.7%	1.9%	10.5%	2.4%

Source: AVO 2003 (own calculations)

Thirdly, education and upbringing is measured through the frequency of visits. In 1995 most museum visitors visited a museum two or three times a year (42%). 40.4% of museum visitors visited museums once a year, and 17.6% visited a museum four times or more a year. Visitors of visual art museums visited a visual art museum mostly once a year (55%). 30% visits a visual art museum two or three times a year, and 15% did have a visit frequency of four times or more. In 2003 museum visitors showed the same pattern. 46% visited a museum two or three times a year. In comparison to 1995 less visitors visited a museum once a year (from 40% to 33%). More visitors visited a museum four times or more a year (21%). For visual art museum visitors remained visiting a visual art museum once a year predominantly (54%). 33% visited a museum two or three times a year, and 13% visited a museum four times or more a year.

At last participation in additional cultural activities is a measure to indicate the influence of education and upbringing. Figure 8.8 shows that visitors of visual art museums tended to visit other types of cultural activities more often than the other groups. In 1995 50% of this group visited theatre performances, 45.4% visited musicals and jazz concerts and 41.9% attended classical concerts. 40.6% of museum visitors in general visited theatre performances, 37.6% visited musicals and jazz concerts and 29.9% visited classical concerts. Non-visitors were less active. 21.5% of this group attended jazz concerts and musicals and 16.5% visited a theatre performance. Ballet and opera are visited least of all cultural activities. In 2003 this remained the same; opera

²⁶ Lo= primary education, lbo/vbo= preparatory vocational education, mavo/mulo= secondary midleschool, havo/vwo/hbs= higher secondary midleschool, MBO=vocational education, HBO= bachelor, WO master= university/master, see also appendix I.

even attracted less visual art museum visitors. Visual art museum visitors still visited theatre performances best in 2003 (47.5%), but theatre performances faced higher competition of musicals (46.5%). Museum visitors already visited musicals and jazz concerts to a greater extent than theatre performances (46% and 42.3%). Non-visitors visited musicals more often than in 1995, this also counts for cabaret.

Figure 8.8: *Cultural activities visited by museum visitors and non museum visitors in the Netherlands in 1995 and 2003.*

	1995			2003		
	Non-visitors	Museum visitors	Visitors visual art	Non-visitors	Museum visitors	Visitors visual art
Theatre	16.5%	40.6%	50%	14.8%	42.3%	47.5%
Cabaret	7.6%	24.1%	30%	10.6%	27.6%	30.9%
Classical concert	6.9%	29.9%	41.9%	5.1%	31.8%	40.4%
Opera	5.1%	14.6%	18.9%	2.7%	11.8%	14.9%
Ballet	1.5%	9.3%	14.5%	1.8%	11.4%	14.8%
Musical /jazz	21.5%	37.6%	45.4%	26.3%	46%	46.5%

Source: AVO 1995 and 2003 (own calculations)

Also participation by parents is included. Since this variable was only present in the survey of 1995 there is only an overview given for this year. Parents of museum visitors often also visited a museum themselves. This counts for museums in general (49%) and visual art museums (56%). All groups visited ballet least. Parents of visual art museum visitors often participated in cultural activities. Except for ballet they did have a participation rate above 40%.

8.3.6 Social Environment

The social environment of consumers is determined by three variables. One indicator for this determinant is the membership of a cultural association. These memberships indicate the influence of the social environment since people often want to be a member of a group. A membership of an association is a symbol for a membership of a certain social group. Figure 8.9 shows that in 1995 27.5% of non-visitors did have a subscription to a library. Only a few respondents were friend of a museum, the amount is higher for visitors of visual art museums than for museum visitors in general (4.9% and 6%). Half of museum visitors and visitors of visual art museums did have a subscription to the library. The membership of a library decreased in 2003, and the membership of an association for cultural heritage increased for museum visitors and visitors of visual art

museums. These two groups also did have more members to friend of the museum associations in comparison with 1995.

Figure 8.9: *Museum visitors by memberships in the Netherlands in 1995 and 2003.*

	1995			2003		
	Non-visitors	Museum visitors	Visitors visual art	Non-visitors	Museum visitors	Visitors visual art
Member friends of the museum	0.8%	4.9%	6%	0.5%	6.3%	8%
Member association cultural heritage	3.6%	13.7%	16.5%	3.6%	16.1%	19%
Member library	27.5%	48.8%	53%	22.5%	43.8%	46.4%

Source: AVO 1995 and 2003 (own calculations)

The membership of a cultural society, such as dance, music or theatre, is also a variable of the determinant social environment. Only a few people were member of these clubs. In 1995 non-visitors were hardly a member of a club (see figure 8.10). Most people were a member of a singing club (5.9%); hardly anyone was a member of a sculpting club (1.1%). Museum visitors were more active in clubs than non-visitors were, but the participation rate was still low. Most visitors were a member of a singing club (12.2%), followed up by a theatre club (8.8%). Also within this group the sculpture club was least popular. Visitors of visual art museums were overall more active in clubs, but in the category where they were most active, the singing club, they scored lower than museum visitors in general did (12%). Remarkable is that a drawing club is second best joined (14.1%).

Figure 8.10: *Museum visitors by participation in a cultural association in the Netherlands in 1995 and 2003.*

	1995			2003		
	Non-visitors	Museum visitors	Visitors visual art	Non-visitors	Museum visitors	Visitors visual art
Drawing club	2.1%	9.5%	14.1%	2.5%	9.7%	13.6%
Sculpture club	1.1%	3.3%	3.9%	1%	5.6%	7.1%
Singing club	5.9%	12.2%	12%	6.5%	15.8%	16.5%
Music club	3.7%	8.4%	10.6%	4.5%	10.5%	11.4%
Theatre club	2.2%	8.8%	10.3%	2.7%	7.3%	7.8%

Source: AVO 1995 and 2003 (own calculations)

8.3.7 Discriminant analysis

In the previous subsections a univariate analysis of the different variables is presented. Within this subsection the discriminant function of the variables is analysed. To indicate which socio-economic factors determine the demand for museums a discriminant analysis is applied. Within this analysis the differences in socio-economic characteristics between visitors and non visitors are shown.

The price factor is not added to the multivariate analysis since the data are not collected on micro level. This variable is only analysed within a univariate analysis

At first differences between museum visitors and non visitors are analysed. Figure 8.11 shows the results of discriminant analysis for 1995 and 2003. For 1995 the discriminant functions are significant.²⁷ 73% of the cases are, with the use of the discriminant functions, classified correctly as visitor or non-visitor. This percentage differs with only 6 percentage points from the 67% that would be classified correctly by using a random sample. Participation in cultural activities shows the highest discriminant function (0.71) Respondents that visit cultural activities such as theatre performances, opera, and classical concerts are often museum visitors. Secondly the type of education makes a difference as a determinant of demand (0.65). Thirdly a membership of a cultural association makes a difference. The discriminant function for this variable is 0.60. Respondents that are member of a cultural association, such as a friend of the museum association or a heritage association are often also a museum visitor. These variables contribute most in being a museum visitor or not. Other socio-economic factors have a

²⁷ Significant at the 0.01 level

discriminant function between 0.43 and 0.11. The type of household, the number and the age of children and the kind of job have the lowest discriminant function (0.15, 0.09 and 0.11). These variables thus contribute least in being a museum visitor or not. The group centroids declare that the socio-economic factors shown in figure 8.11 separate museum visitors from non visitors. A high value represents visitors and a low value non-visitors. At last a value for the canonical correlation is shown. The value for this canonical correlation is 0.48, which means that the effect of the discriminant functions is large enough to use the outcomes of the model.

The third column of figure 8.11 shows the discriminant functions for 2003. All functions are significant. Just like for 1995 participation in cultural activities has the highest discriminant function, namely 0.76. This is even somewhat higher than for the year 1995. Also being a member of cultural association scores high again (0.60). The third variable is the type of education. However this variable shows a lower value than in 1995, namely 0.59 instead of 0.60. Also the education of the parents shows a lower value. The education of the father is 0.35 (for 1995 0.43) and the education of the mother scores 0.28, for 1995 this was 0.36. Again these variables contribute most in determining whether someone is a museum visitor or not. Participation in cultural organisations, such as drawing lesson or being a recreational theatre player, shows the same value as for 1995, namely 0.31. The income of the respondents shows a lower value than in 1995 (0.20). At last the type of household is analysed. The discriminant function for this variable is different from 1995 and shows a negative value of -0.12. The variable the number and the age of children is again the lowest (0.06). Just like for the year 1995 these socio-economic factors have the lowest contribution in determining if someone visits a museum or not. Within the analysis the kind of job is not analysed since the data were not available to the same extend as for 1995. These discriminant functions are related to museum visitors, since the group centroids give the highest value (0.88) for museum visitors. A high value predicts a person is a visitor, while a low value is connected to non-visitors. 75% of the cases are, with the use of the discriminant functions, classified correctly as visitor or non visitor. This is two percentage points higher than for 1995, but in this case the percentage of the cases that is classified correctly does not differ to a great extend (8 percentage points) from the 67% that would be classified correctly with the use of a random sample. At last the canonical correlation is shown. Again this value of 0.51 is sufficient to use the model.

Figure 8.11: Discriminant analysis of socio-economic factors of museum visitors and non-visitors in the Netherlands for 1995 and 2001.

Socio-economic factors	1995	2003
	Standardised discriminant coefficients	Standardised discriminant coefficients
Cultural activities	0.70	0.76
Membership cultural association	0.60	0.60
Education	0.65	0.59
Education Father	0.43	0.35
Education mother	0.36	0.28
Income	0.31	0.20
Participation in cultural association	0.31	0.30
Type of household	-0.15	-0.12
Kind of job	0.11	-
Children	0.09	0.06
Group centroids		
Museum visitors	0.74	0.88
Non-visitors	-0.37	-0.38
Canonical correlation	0.48	0.51
Correct classified	0.73	0.75

Source: AVO 1995 and 2003 (own calculations).

Apart from a comparison between visitors and non visitors a comparison is made between visitors of visual art museums and visitors of museums with another type of collection. Figure 8.12 shows the discriminant functions for this analysis. Regarding the group centroids these functions distinguish visitors of visual art museum from visitors of other type of museums. However, the differences between the groups are less strong than between museum visitors (in general) and non visitors. A high value indicates visitors visit a visual art museum, while a low value stand for a visitor of another type of museum. For 1995 69% of the cases are, with the use of the discriminant functions, classified correctly as visitor of a visual art museum or visitor of another type of museum. When using the discriminant functions the different types of visitors can be

classified better than without the functions.²⁸ With the use of the discriminant functions visual art museum visitors and visitors of other types of museums can be classified in the right group. Just like for museum visitors in general, participation in additional cultural activities such as theatre is the most important determinant. For visual art museum visitors the discriminant factor is even somewhat higher (0.74). The type of education of the respondent and his or her father is the second most influencing variable (0.55). The education of the mother follows these variables with 0.41. These socio-economic factors contribute to the greatest extent in determining which type of museum a respondent visits. In contradiction with the discriminant functions of museum visitors in general the discriminant functions show a negative value for the variables type of household and age of children. When a person visits a museum, he or she does not often have young children or a family with children. In agreement with the function for museum visitors in general, the type of job scores the lowest value (0.12). Remarkably participation in a cultural association, like a member of a theatre club or a musician, also scores the lowest value of 0.12. This means that these variables play a minor role in determining whether a museum visitor visits a visual art museum or another type of museum. At last a value for the canonical correlation is shown. This value is 0.41, so enough to use the model.

For 2003 all functions are also significant. With the use of the discriminant functions, 67% of the cases are classified as visitor of a visual art museum or a visitor of another type of museum. Just like for 1995 the variable cultural activities scores the highest (0.64). Although the value is lower than for the year 1995. Second best is education, this is identical to the situation for 1995 and even the values for this variable stayed the same (0.55). The education of the father and mother both give higher values than in 1995. The education of the father has a discriminant function of 0.39 and education of the mother of 0.34. Being a member of a cultural association is the third best value (0.42). This variable has a higher discriminant function than for 1995. Just like for 1995 these factors play a larger role in determining if someone visits a visual art museum or another museum. Participation in cultural activities, such as dancing in a (recreational) dance society, has a higher value than the value for 1995, namely 0.24 instead of 0.12. The other discriminant functions show approximately the same value as the one for 1995. Yet again these variables contribute to a smaller extend in determining which type of museum a visitor visits. The groups centroids differ somewhat in comparison to 1995, the centroid for visual art museum visitors has a value of 0.33 and for visitors of other type of museums -0.58. That means that the model fits for visitors of visual art museums, but that the differences between the groups are smaller. Also the canonical correlation is sufficient (0.40) to use the model.

²⁸ Since the proportion within the population is 50%-50%, a percentage of 69 cases that are classified correctly is a twenty percent improvement of the prediction.

Figure 8.12: *Discriminant analysis of socio-economic factors of visual art museum visitors and visitors of other type of museums in the Netherlands for 1995 and 2001.*

Socio-economic factors	1995	2003
	Standardised dicriminant coefficients	Standardised dicriminant coefficients
Cultural activities	0.74	0.64
Education	0.55	0.56
Education Father	0.55	0.39
Education mother	0.41	0.34
Membership cultural association	0.35	0.42
Age of children	-0.35	-0.41
Type of household	-0.33	-0.41
Income	0.25	0.21
Participation in cultural association	0.12	0.24
Kind of job	0.12	-
Group centroids		
Visual art museum visitors	0.44	0.33
Visitors of other type of museums	-0.46	-0.58
Canonical correlation	0.41	0.40
Correct classification	0.69	0.67

Source: AVO 1995 and 2003 (own calculations).

8.4 Results

The univariate and multivariate analyses have revealed the relation between the different factors that influence demand. The outcomes of these analyses are the basis for answering the hypotheses.

At first the fourth hypothesis is answered, which is as follow:

Besides price, education, income, available time, and social environment are important factors that influence the demand for museums.

To answer the hypothesis the results of the different analyses should be compared. At first the different costs of a museum visit are analysed. There are three main cost items. One of the costs items is the entrance fee, which is only 20% to 25% of the total costs.

Secondly there are consumption costs. These costs are the largest part of the entire costs. At last there are transportation costs, which are the second largest costs. The total costs of a museum visit did rise between 1995 and 2003. Since there was no data available on micro level the influence of the costs on the demand, there cannot be given an answer about the role of the costs in relation to the other determinants.

Another economic factor that is analysed is income. Museum visitors have a higher average income per month than non-visitors have. In comparison their income did rise with 5% in 2003. For non-visitors this income did increase with 4%. Also Ganzeboom notices that museum visitors have a higher average income than non-visitors have (see paragraph 5.3). However the factor income does not have a large influence on demand. The discriminant function shows a value of 0.30 for 1995 and 0.20 for 2003. These values are lower than for other variables, so the income seems to play a minor role in determining the demand for museums.

The third determinant that is analysed is available time. This is analysed through the type of household, the age of the children and the kind of job. In 1995 both museum visitors and non visitors in general did have a family household with children. Museum visitors were more often single than non visitors are. In 2003 the differences between the two groups increased. Also more museum visitors were a couple without children. The type of household does not seem to influence the demand to a great extent. The discriminant function gives a value of -0.15 for 1995 and -0.12 for 2003. These values are too low to influence demand largely. Also the age of the children does not seem to contribute heavily in determining museum demand. Non visitors mostly have the youngest children, but the discriminant function is very low (0.09 and 0.06). At last the kind of job also seems to have a minor influence. Most museum visitors do have a paid employment. However, non visitors also often have a paid employment. The difference is that non visitors are more often unemployed than museum visitors are. The discriminant function is also low (0.11). Paragraph 5.4 shows that the total amount of available time decreased. The effect of available time on demand was not researched extensively before, but it is stated by Ganzeboom that museum demand is not influenced that heavily by the time a consumer has available as theatre demand. This can also be concluded from the analysis, the available time does not distinct visitors from non visitors to a great extent.

To measure the impact of the factor education and upbringing four variables are used. First education is analysed. Museum visitors were higher educated than non visitors, this also counts for their parents. The average education level did rise in 2003. However, parents were still educated on a lower level than their children were. The discriminant function for these three variables are higher than average. Education has a discriminant function of 0.65 for 1995 and of 0.59 for 2003. Also surveys of Ganzeboom show that

education influences museum demand to a great extent (see paragraph 5.5.). The education of the parents is less important but still has a relatively high function. The discriminant function for the father's education is 0.43 for 1995 and 0.35 for 2003. For the mother this is somewhat lower, namely 0.36 for 1995 and 0.28 for 2003. These functions are lower for 2003 than for 1995. The last variable that is used for the analysis is participation in cultural activities. Within this variable visiting cultural activities such as theatre, ballet and opera is analysed. Museum visitors visited culture more often than non visitors did. Theatre and musicals were the most popular. In 2003 the visiting rate of museum visitors increased. Participation in cultural activities seems to be a highly important determinant of demand. The discriminant function for this variable is 0.70 for 1995 and 0.76 for 2003. For both years this variable contributes most in determining museum demand. Overall all variables of the factor education and upbringing score high. Bourdieu as well states that education and upbringing is an important factor. He claims that it forms a certain taste for culture (see paragraph 5.5).

The last determinant of demand is social environment, which is measured by a membership of a cultural association and participation in cultural associations. Just a few non visitors are member of a cultural association. Most of them were a member of the library. Museum visitors were also mostly a member of the library, but did also participate in other kind of organisations. Being a member of a cultural association has a high discriminant factor, namely 0.60 for 1995 and 2003. Apart from being a member of a cultural association, participation in cultural organisation is a variable that is used to analyse the determinant social environment. Different memberships are analysed such as singing in a choir, drawing lessons and making music in an orchestra. All memberships concern memberships for non professional players and dancers. These cultural activities were not well attended. Singing was the most popular one for both visitors and non visitors. In 2003 participation increased a bit. The discriminant factor for this variable is 0.31 for 1995 and 0.30 for 2003. This is just around the average factor value. In general, the factor social environment scores quite high. Ganzeboom (1989) and Maas(1991) also state that the social environment is important in determining cultural participation. In paragraph 5.6 shows that museum visitors often visit a museum to gain a social status.

Education and upbringing influences demand to the greatest extent. All variables that education and upbringing enclose contribute largely in determining whether someone visits a museum or not. The most important variable is the participation in cultural activities. This is not startling since consumers often visit the arts out of habit persistence. Together with their education and influence of parents this habit persistence develops itself. Education and upbringing is followed up by social environment. Also the variables for this factor score higher than average. Income is less important than the

other two factors, but still contributes more in determining museum demand than available time. Available time seems to be least important. Chapter 7 shows that price also is strongly related to demand. The price elasticity is low, so visitors are not influenced to a great extent by the amount of money they have to pay. Since data concerning the price were not available in the AVO data the price is not taken into account within this survey, which is also the problem for Lewis and Seaman who used the same kind of data in 2004 (Seaman, 2006: 7). However, the influence of the price in relation to the other determinants cannot be analysed through the AVO data. It is possible to draw a conclusion about the influence of the other determinants. The determinants education and upbringing and social environment seem to have a large effect on demand. Since the discriminant functions in the analysis for 1995 and 2003 are the largest for these variables, the conclusion can be drawn that next to price other determinants of demand are important. The hypothesis can be verified. Besides price, other factors determine demand, wherein education and upbringing and social environment are the most important ones.

The fifth hypothesis concerns the difference between visual art museums and museums in general. This hypothesis is presented as follow;

The different determinants of museum demand have a different effect on demand for a visual art museum than demand for museums in general.

Just like the previous hypothesis this hypothesis can be answered by comparing the outcomes of the analysis in paragraph 8.3. Besides comparing the analysis of the socio-economic factors with each other, also a comparison is made between the outcomes of the museums in general and the outcomes of the visual art museums. In this way verification can be given about the hypothesis.

Since the costs are only analysed on macro level for museum visitors nothing can be assumed about the cost separation for the different types of museums. Therefore this factor will not be used for answering the hypothesis.

Visitors of visual art museums did have a higher income than visitors of other kinds of museums and than non-visitors. Their income level increased with 3% in 2003. The US Census Agency also shows these kinds of results (see paragraph 5.3.). However the discriminant function is not that high. The values for these functions are even lower than for museum visitors in general. It seems that the income of the respondents does not play a large role in determining which museum someone visits.

Secondly available time is analysed. This is done by analysing three variables. Firstly the type of household is examined. Visitors of visual art museums show the same pattern in the type of household they did have as museum visitors. There is a little difference; visitors of visual art museums were more often single than visitors of other

type of museums were. In 2003 the total image changed. This also counted for visitors of visual art museums. These kinds of visitors were more often a couple without children than in 1995. In contradiction to the discriminant analysis for museum visitors and non-visitors the discriminant analysis for visual art museum visitors does give a discriminant function for the variable about children. These values are -0.35 and -0.41. It thus seems that the age of the children does contribute to the kind of museum a visitor visits.

The third factor is education and upbringing. This turned out to be the most important factor in determining museum demand. Visitors of visual art museums were higher educated than other type of visitors. The univariate analysis shows that this group did have a bachelor or master degree more often. In 2003 the share even increased. The discriminant functions are also relatively high. Although these functions are somewhat lower than they are for museum visitors in general. Next to the education type the respondent followed also the education of the parents is taken into account. Just like for museum visitors the average level of education is low and did increase a bit in 2003. Also mothers did have a lower education degree than fathers. Parents of visitors of visual art museums did have a higher education level than parents of visitors of other type of museums. The discriminant functions did decrease after 1995 and are also lower than for museum visitors. Fathers score a higher value than mothers do. The discriminant functions are still higher than average and education thus seems to contribute in distinguishing visitors by type of museum they visit. At last the cultural activity of respondents is analysed. Visitors of visual art museums visit more cultural activities than visitors of other type of museums do. In 1995 a difference with museum visitors in general was that visitors of visual art museums visit classical concerts the most. In 2003 this changed in theatre visits. The discriminant functions are the highest of all for this variable, just like for museum visitors in general. In 1995 visitors of visual art museum have a higher discriminant function than museum visitors in general have. In 2005 this has changed.

At last the socio-economic factor social environment is analysed. The variable membership of a cultural association shows that in 1995 most visual art museum visitors were member of the library. The discriminant functions are high for this variable. Nevertheless the value of this discriminant function for museum visitors is higher. Apart from the memberships, participation in cultural associations as ballet companies and orchestras is analysed. Visitors of visual art museums showed also a low participation rate, but they were more active than museum visitors are in general. The difference was that for visual art museum visitors drawing was the most popular activity, while museum visitors in general more often attended singing clubs. In 2003 singing was the most popular activity both for museum visitors in general and for visitors of visual art museums. The discriminant functions for this variable are low. For 1995 the value is two

times lower than for museum visitors in general, but for 2003 the differences are smaller. For museum visitors in general this factor contributes to a high extent in determining museum demand. For visual art museum visitors the social environment seems to influence the demand for a certain type of museum in a smaller extent.

Just like for museum visitors education and upbringing contribute most in determining what kind of museum a museum visitor visits. In contradiction to museum demand in general social environment has a smaller influence in determining the kind of museum that is visited. Social time and available time contribute in a roughly same extent what kind of museum is visited. Available time thus plays a more important role in determining which kind of museum is visited than in determining if a museum is visited. Income plays the least important role in both analyses. The different determinants of museum demand do not show great differences in demand for museums in general and for visual art museums. The only difference is that the available time influences the demand for visual art museum in a bigger extent than demand for museums in general. Further more the demand for museums is explained by the different determinants in a larger extent than the demand for visual art museums can be explained. The hypothesis is verified since there are any differences to observe. However it should be taken into account that the differences are not astonishing.

8.5 Conclusion

The theories and surveys concerning demand for cultural activities show that participation in culture is determined by mainly five socio-economic factors. About the level of importance hardly any surveys are done. Only Ganzeboom states that education is one of the most important determinants. However he does not show a ranking. Since the costs of the visit were not available in the AVO data this factor is not taken into account during the multivariate analysis. This analysis has shown that education and upbringing is the most important factor that influences demand. Next to this variable social environment plays an important role. Hypothesis 4, concerning the different factors that influence demand, can be verified. It is the case that next to price other variables play a role in determining whether someone will visit a museum or not. Hypothesis 5 focuses on the differences between the different types of museums. In the analysis it was clear that most socio-economic factors influence demand for a certain type of museum in the same way as museum demand in general. However one factor differs from this. The age of the children is more determining the demand for visual art museums than the demand for museums in general. Also the values of the discriminant functions differ from each other. Therefore the fifth hypothesis can also be verified. Nonetheless it is important to notice that the differences are not overwhelming.

9 Conclusion

9.1 Introduction

In this concluding chapter the results of this research are discussed. Firstly the outcomes of the hypothesis are briefly summarised and the central question is answered. Secondly some suggestions for further research are given.

9.2 Results and answers

9.2.1 Hypotheses

The estimation of the price elasticity has shown that the price elasticity for both the short-term and the long-term are inelastic. The short-term price elasticity of museum demand is 0.24, which implies that a 10% change in price will result in a 2.4% change in visits. If the price goes up, the demand falls and visa versa. The long-term price elasticity doubles the short-term one and is 0.52. These results are in line with results from previous studies. Although there are fewer studies done on the price elasticity of museum demand, the studies all show an inelastic price elasticity of demand. The results of the estimated price elasticity also are in agreement with the theory about price elasticity of Katz and Rosen, who claim that the long-term price elasticity of demand is bigger than the short-term since consumers need time to react on price changes. The first hypothesis, which stated that the short-term and long-term price elasticity of museum demand is inelastic and a forecasted higher long-term price elasticity than the short-term one, can be verified. Just like the first hypothesis, the second hypothesis is verified. This hypothesis assumed there is hardly any difference in price elasticity in demand across time and countries. The literature review showed a (short-term) price elasticity of museum demand between 0.10 and 0.25. The result of the estimation is 0.24, which is in line with previous research that date back to the eighties, and are executed in different countries. Although the differences between the estimated price elasticities of demand are small, there can be made a distinction between the different price elasticities. Goudriaan (1984) for instance recovers the lowest price elasticity, since he calculated the price elasticity of state museums. These types of museums have a lower price elasticity since many tourists who are not sensitive to prices visit them. In contrast with the difference between Goudriaan's the estimated price elasticity and the other estimated elasticities, the study of Darnell shows a much bigger difference in his estimated price elasticity. The outcome of his study shows a price elasticity of 0.54, which is caused by the character of the museum's collection. In stead of the period and the country where the study is done, the type of the museum's collection seems to have an influence on differences in price elasticity. This is also the statement of the third hypothesis. Due to insufficient data this hypothesis cannot be verified or falsified.

However the available data slightly indicates a smaller effect of a price change on demand for visual art museums.

The last two hypotheses dealt with other factors that determine museum demand. The theoretical framework discusses how sociologists argue that museum demand is influenced by economics factors and social factors. Ganzeboom for instance states that education is an important factor that influences demand for museums. In the last part of this survey the statements of these sociologists are tested. The last two hypotheses are answered with the use of a discriminant analysis. Within this discriminant analysis the price is not analysed.²⁹ The first hypothesis states that other determinants besides price influence museum demand. The result of the discriminant analysis shows that education and upbringing influences museum demand in a great extend. This is in line with the theory presented in chapter five. Ganzeboom and de Graaf (1991) state that education and upbringing influence the demand for museums, and culture as a whole, in a great extend. The higher the level of education, the better consumers understand the meaning of art. Also Kirchberg (1996) states that education and upbringing is an important factor that influences demand. Secondly the discriminant analysis shows that the social environment of the consumer is an important determinant of museum demand. This is also recognised by Maas (1991) and Ganzeboom (1989) who claim that consumers tend to visits a museum to join a certain social group. The last hypothesis makes an assumption about the effects of the determinants of museum demand to different types of museums. The discriminant analysis of visual art museum visitors and visitors of other types of museums shows at first sight no huge differences in outcome in comparison with the outcome of the discriminant analysis for museum visitors in general. However the available time of consumers is a more important factor for visual art museum visitors than for museum visitors in general, which is specifically caused by the fact that visitors of visual art museums have in fewer cases young children than museum visitors in general. This is also shown in the research of Goudriaan (1985).

9.2.2 Central research question

After summarising the outcomes of the hypothesis one last thing remains, which is the answering of the central research question. This research question is:

'What is the price elasticity of museum demand, what other factors influence this demand and are there any differences to observe between the different types of museums?'

²⁹ The price is not analysed since information about prices was only available on macro level and the data about socio-economic factors was only available on micro level.

In the period of 1984 - 2003 the price elasticity of museum demand is 0.24 on the short-run and 0.52 on the long-run. As stated before, the price elasticity is inelastic. If museums would have free entrance this would not result in a huge increase in visits. Free entrance would probably only attract more current visitors, so there will be a small increase in visits but not in visitors. In the theory part it is shown that beside price other factors influence the demand for museums (see for instance Ganzeboom). The discriminant analysis, presented in chapter eight, showed that education and upbringing is the most distinctive factor between visitors and non-visitors. The higher the education, the more likely a consumer will visit a museum. Also social environment plays an important role. If a consumer is involved in a cultural orientated environment in a great extent, he or she probable will also visit a museum.³⁰ Since the price elasticity is inelastic these determinants seem to play a bigger role in determining whether a consumer will visit a museum or not. At last the central research question focuses on differences in determinants of demand for different types of museums. The discriminant analysis shows a difference in visitors profile in the sense that visitors of visual art museums have a higher education degree, earn more money, and participate more in cultural activities. The outcome of the discriminant analysis shows almost the same results as for museum visitors in general, but visitors of a visual art museum distinguish themselves from visitors of other types of museums in having fewer young children and therefore the available time is a more important determinant of demand for visitors of visual art museums than for visitors of other types of museums. This indicates a difference between visual art museum visitors and visitors of other types of museums. The price elasticity could not be estimated for visual art museum separately. However, an analysis is done for demand and price. The demand for visual art museums developed itself differently than the demand for other types of museums. Demand for other types of museums is declining during the last years, while demand for visual art museums is increasing. Since the price index of visual art museums seems to develop itself comparable to the price index of museums in general, visitors of visual art museums seem to be less price sensitive than museum visitors in general are. Nevertheless, no hard judgements can be made since the price elasticity could not be estimated.

A summarised answer to the central research question is that the price elasticity of museum demand is both in the short-run as in the long-run inelastic. Next to the price education and upbringing and social environment are important determinants of demand and the demand for visual art museums is determined in a slightly different way than the demand for other types of museums.

³⁰ In the sense of participating in cultural clubs and having cultural memberships.

The results of both the literature study and the empirical study show that 'a-free-entrance' policy will hardly attract a wider audience. To attract different socio-economic groups more actions are needed. Firstly, a decline in the ticket price will reduce just 25% of the costs. The other 75% remains the same, so the total costs are still large. Free entrance thus does not mean that there are no costs involved while visiting a museum. Therefore other factors that influence demand for museums should be taken into account. Since education and upbringing is one of the most important factors, investing a cultural policy for children is important. So courses like 'Culturele Kunstzinnige Vorming' and 'Klassieke Culturele Vorming'³¹ are probably a good initiative to attract more people to cultural activities. Whether these courses will result in a more diverse museum public will be revealed in the forthcoming years.

9.3 Recommendation for further research

A research usually brings along new questions. The deeper I got into the subject, the more questions were raised in my mind. Since this master thesis should be written in a certain period it was impossible to answer these extra questions and therefore they are posed in this section as recommendations for further research.

The analysis of the different costs of a museum visit showed that the entrance fee is only 25% of the total costs. Therefore it would be interesting to analyse the impact of the development in price of train tickets or gas. Since transportation costs are 35% of the total costs it is imaginary that the development of train and gas prices have an influence on museum demand. Variables concerning these prices can be adjusted in the econometric model that estimates the derived demand function. Another factor that is related to museum demand is the amount of tourist visiting a museum. Since there is no sufficient data available at the moment, separate price elasticities for this group could not be calculated. However, it is interesting to calculate a price elasticity of museum demand for tourists since it is likely that this group of visitors influences the price elasticity of museum demand in general. Since tourists already made bigger costs to visit the Netherlands, like a flight ticket and a hotel, it is likely that their price elasticity of museum demand is close to zero. At last it would be interesting to adjust a price factor in a discriminant analysis together with the other determinants of museum demand. In this way an order of importance can be given.

³¹ Cultural courses for high school students.

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Appendix I: Explanatory word list

Algemene Rekenkamer	The National Court of Auditors
AVO	Aanvullend voorzieningengebruik Onderzoek (Facility Use Survey)
CBS	Centraal Bureau voor Statistiek (Bureau of Census in the Netherlands)
CPI	Consumer Price Index
Cultuurnota	A four year policy for cultural institutions in the Netherlands formed by the Ministry of Education, Culture and Sciences.
CKV	Cultureel Kunstzinnige Vorming (Culture and arts course)
DANS	Data Archiving and Networked Services
HAVO	Hoger Algemeen Voortgezet Onderwijs (Higher secondary education)
HBO	Hoger Beroeps Onderwijs (Bachelor of four years)
HBS	Hogere Burger School (Higher secondary education)
ICOM	International Council of Museums
KCV	Klassieke Culturele Vorming (Classical culture course)
LBO	Lager Beroeps Onderwijs (primary vocational education)
Lo	Lager onderwijs (primary school)
MAVO	Middelbaar Algemeen Voortgezet Onderwijs (secondary middle school education)
MBO	Middelbaar Beroeps Onderwijs (secondary vocational education)
MULO	Meer Uitgebreid Lager Onderwijs (secondary middle school education)
Profijtbeginsel	The 'users-pay' principle
PvdA	Partij van de Arbeid (Party for Labour, a political party in the Netherlands)
R²	Pearsons R squared
SCP	Sociaal Cultureel Planbureau (Social Cultural Planning Office)
SP	Socialistische Partij (Social Party, a political party in the Netherlands).
VBO	Vorbereidend Beroeps Onderwijs (Preparatory secondary vocational education)

VVD	Vereniging voor Vrijheid en Democratie (Association for Freedom and Democracy, a political party in the Netherlands).
VWO	Vorbereidend Wetenschappelijk Onderwijs (scientific secondary education)
WO	Wetenschappelijk Onderwijs (University)

Appendix II: Calculations and formulas

As explained in chapter 4, price elasticity can be calculated in different ways. The following formulas are commonly used formulas to calculate price elasticity.

$$\varepsilon = \frac{\Delta B / B}{\Delta P / P} = \frac{\Delta B / \Delta P}{B / P} = \frac{dB / dP}{B / P}$$

In this case, B reflects demand and P price, delta reflects the change, and d is a sign for differentiating. Differentiating is used to determine the derivative of a function. This is done at one point of the curve. The formula replaces delta with d since it is calculating small changes.

As explained in chapter 4 and 7 I interpret $\frac{d \log P}{dP}$ as the price elasticity of museum demand when calculating the price elasticity of museum demand. I use this log function since I want to calculate one price elasticity for the whole period. In this method it is assumed that the price elasticity is the same for the whole period. By using the differentiation method each point on the curve will give a price elasticity.

By definition;

$$\frac{d \log P}{dP} = \frac{1}{P}$$

By definition the derivative of log P is equal to one divided by P. To interpret the meaning of log P the other side of the equation should be filled in. Log P can be interpreted as a price elasticity of museum demand since;

$$\int \frac{1}{P} * dP = \log P$$

Wherein \int stand for the integral. The integral is the opposite of differentiating. The integral of 1 divided by P times P differentiating is equal the derivative of log P.

Appendix III : Outcomes derived demand function

Variable	Value ^a
Constant	1.56 (1.83)
Available income (Y)	0.33 (1.81)
Price of substitutes (Ps)	1.50 (2.59)
Price (P)	-0.24 (3.05)
Habit persistence (B ₋₁)	0.54 (3.97)
Tourists (T)	0.19 (2.37)
R ²	0.91
Durbin's h	0.69
Durbin-Watson	2.18

^a :The values between the parenthesis are the t-values.

The formula presented in chapter 7.1 can be filled in as follow (wherein the variables remain in a log function).

$$\text{Demand}_t = 1.56 + 0.33 * \text{income} + 1.50 * \text{prices of substitutes} - 0.24 * \text{entrance fee} + 0.19 * \text{foreign hotel visitors} + 0.54 * \text{habit persistence}$$

The price elasticity is in conformity with the values of previous surveys. Next to the price elasticity the model provides elasticities for the other variables. The elasticity for available income is quite low. An increase in income of families results not in the same increase in demand. The prices of substitutes have a high elasticity in comparison to other surveys. Goudriaan (1984) for instance shows an elasticity of 0.56. The elasticity of habit persistence shows a quite regular value for museums. Goudriaan (1984) estimated moreover the same elasticity; also the elasticity of tourists is fairly similar to the values of his research.

Appendix IV: Recoding scheme socio-economic factors

Variable	Current coding	Recoding
Education ¹	None	0
	Primary school	6
	Vocational education	9
	Secondary education	10
	Higher secondary education	11.5
	Secondary vocational education	12
	Bachelor	14
	Master	16
Education parents	None	0
	Primary school	6
	Vocational education	9
	Secondary education	10
	Higher secondary education	11.5
	Secondary vocational education	12
	Bachelor	14
	Master	16
Visiting rate ²	None	0
	Once a year	1
	Two-three times a year	2.5
	Four or more	5
Cultural activity	Theatre	1
	Cabaret	1
	Classical concert	1
	Opera	1
	Ballet	1
	Musical	1
	Gallery	1
	None	0
Cultural activity parents	Classical concert or opera	1
	Theatre or cabaret	1
	Ballet	1
	Museum	1
	Playing an instrument	1
	None	0

Membership museum ³	No	0
	Yes	4
Membership Library ³	No	0
	Yes	1
Membership cultural association	Drawing club	1
	Sculpture club	1
	Singing club	1
	Music club	1
	Theatre club	1
	Photography club	1
	None	0
	Type of household ⁴	1 person
	No family	1.5
	Couple	2
	Couple with children	4
	Single with children	6
Age of children ⁵	0 – 4 years	8
	5 – 11 years	4
	12 – 30 years	2
	No children	0
	Job ⁶	Paid employment
	Independent	8
	Unemployed, retired or unfit to work	0
	Student	4
	Own household	4
Age	Number	Number
Income	Number	Number

¹⁾ The value for education is estimated by the years of education someone followed.

²⁾ The value for visiting rate is the mean value of the class.

³⁾ The more intensive the membership the higher the value.

⁴⁾ The value for household is estimated by the number of adult and children in the household. A single parent household is more time intensive and therefore has a higher value.

⁵⁾ The value for the age of the children estimated by the thought that smaller children need more time by their parents.

⁶⁾ The value for the job is estimated by the intensity of the job.