OPERATIONAL ADVANCES IN TOURISM RESEARCH

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Resumo:

O turismo tornou-se um sector económico importante. O objectivo deste trabalho é divulgar os recentes desenvolvimentos na investigação aplicada nesta área. Depois de um resumo das actuais tendências de base no estudo do turismo, descrevem-se dez pontos e questões-chave relacionados com o turismo, seguidos de uma descrição de dez metodologias operacionais de pesquisa usadas no estudo do turismo. Estas considerações são posteriormente ilustradas através de uma aplicação empírica ao desenvolvimento de políticas relacionadas com os efeitos macro-económicos do turismo na área da herança cultural. O caso de estudo em questão, a cidade de Amesterdão, consiste numa análise empírica através de uma meta-análise, uma análise input-output e uma micro-simulação.

Palavras-chave: turismo, comportamento do consumidor, E-serviços, micro-simulação, Amesterdão

Códigos JEL: L83, D12, L86, C15

Abstract:

Tourism has become an important economic sector. This paper aims to highlight recent developments in applied tourism research. After a sketch of the background of current tourism trends, it describes ten key issues and concerns in tourism followed by an outline of ten operational research methodologies in modern tourism research. These considerations are then illustrated by means of an empirical application to policy development regarding macro-economic effects of tourism in the area of cultural heritage. The case study under consideration, the city of Amsterdam, is empirically analyzed by means of meta-analysis, input-output analysis and micro-simulation.

Keywords: tourism, consumer behaviour, E-services, micro-simulation, Amsterdam

JEL Codes: L83, D12, L86, C15

1. World-wide Discovery Tours

It seems as though our modern world is full of visitors who seek to discover unknown facilities in unknown places. This is certainly not a new phenomenon, but the scale of tourism is unprecedented. Modern tourism has to be positioned against the background of world-wide communication and long-distance transportation opportunities. Our modern world is moving towards a leisure economy, where a rising part of everyone's discretionary income is spent on culture, recreation and tourism. With an increasing share of the population that is retired, a new leisure class – often rather wealthy and healthy – is emerging. Consequently, the economic significance of the leisure industry is gaining more and more importance. Mass tourism – which started essentially after World War II, when Pan American World Airways introduced tourist class – is the most pronounced exponent of the modern leisure economy, where culture, nature, shopping of sheer entertainment form the main motives.

The leisure industry has created entirely new international markets. Local and national governments regard this new sector as an important source of foreign exchange, while it also contributes to sustainable development (cf. Holden 2000). The rising demand for foreign – and often exotic – destinations was stimulated by fast long-distance transport (such as jet airplanes and more recently fast rapid trains). The investments in the leisure industry – and in the tourist industry in particular – have been formidable over the past decades.

The structure of the tourist industry is rather complex and encapsulates intertwined links between travel agencies, tour operators, airlines, railway companies, car rental firms, hotel and restaurant chains, marketing agencies, tourism bureaus and the popular media. Since the tourism industry has many specialized market niches, it is clear that tourism marketing – strongly supported by the modern ICT sector (see Giaoutzi and Nijkamp 2006) – has become a critical success factor.

Tourism has turned into a global economic sector with a wide and significant impact on the socio-economic and ecological development of regions and nations. Its importance has increased over the past decades, as a consequence of the rise in spending power of increasingly mobile consumers and households, the increasing accessibility of tourist regions or cities all over the world, the emergence of relatively cheap transport modes (such as low cost carriers), the changes in life styles (with more trips over longer distances) and the internationalization trends in modern societies.

Tourism is on a rising edge and will likely become one of the largest economic sectors in our modern open global economy. Also in the EU, tourism has become a key sector expanding the economic base of destination areas, stimulating foreign trade and exchange, and favouring employment in many branches of the economy. In line with the trend of an increasingly important tourist sector, cultural tourism is on a rising edge as well. However, to achieve a really sustainable improvement of the great opportunities of tourism for higher competitiveness and growth, many tourism initiatives have to be fine-tuned in order to guarantee an ecologically efficient development in an age with increasing volumes of tourists. The figures produced by the WTO (World Trade Organization) suggest a steady increase in tourist volumes all over the world. Of course, we have witnessed sometimes a temporary dip (e.g., after the SARS epidemics or after September 11), but the structural trend is one of a permanent rise in both domestic and international tourism.

It is noteworthy that tourists form a rather heterogeneous class. Some want to enjoy a given city or a cultural atmosphere, others are oriented towards specific goods or cultural amenities, such as a lake, a mountain, a museum or a historical district. Many tourist destinations offer a broad package of facilities to be visited, so that they can attract a maximum number of potential visitors. Other tourist places have only one unique sales label, such as Agra with its Taj Mahal, or Pisa with its skew tower. An important question from a marketing perspective is now whether tourists are more interested in distinct features of a given tourist good (the 'disjoint' view) or whether they derive a higher level of satisfaction from the tourist good as a whole (the 'integrative' or 'holistic' view). Answers to such questions call for solid empirical field work on the motives and consequences of modern tourist behaviour.

As mentioned, tourism is no doubt one of the most fast-growing industries in our globalization era. More accessible modes of transports, an increase in disposable time and income to be used for leisure activities, faster connections, cheaper airfares and

the emergence of the electronic age are among the reasons for a new widespread attitude towards international tourism. Mass tourism is certainly a major phenomenon of our time. The reasons why people travel vary, but they all have impacts on our environment and the way cities are transformed and developed (cf. Page 1996). People travel to enjoy different types of resources, and the way they experience them has different impacts on the local economies too (cf. Tallon et al. 2006).

Sustainable tourism strategies for a tourist site need to account for various aspects of strategic importance: conservation of the site, citizens' quality of life and tourism satisfaction. These are often conflicting issues that policy makers have to investigate with the relevant tools and proper guidance. There is the need to move from the assessment of current best practices to the exchange of successful tourist strategies in the context of cultural and ecological heritage policy.

Clearly, there is a tension between the beauty of a tourist site shaped by a long historical and cultural tradition and the short-term revenues that are often expected from a commercially – oriented tourism policy where tourism is seen as a catalyst for economic growth. Consequently, the issue of sustainability is at stake here. Tourist sites reflect a wealth of positive externalities for society that are hardly incorporated in any market system, but the danger is that uncontrolled tourism causes a wide variety of negative externalities that may cause a structural and irreversible erosion of cultural assets (Amelung 2006). From this perspective, it is important to exploit and emphasize local identities and resources that may be instrumental in creating a balanced tourism development of an area. Tourism competitiveness among different destinations may then have to be positioned in the broader context of tourism sustainability, while still respecting the need for efficiency increase in the tourist sector (eco-efficiency, carrying capacity). It is evident that a balanced tourist policy calls for a professional and strategic management of tourist flows at both regional and national levels (see also Crouch and Ritchie 1999). It goes without saying that tourism has gained an increasingly more prominent place in modern economic research.

The present paper aims to highlight trends and advances in tourism policy and research issues. It offers an overview of various concerns and research methods and is organized as follows. Section 2 provides in a concise way a review of various prominent research and policy issues in the tourism sector. Next, in Section 3 we will pay attention to a range of important recent research methods that are geared towards applied insights into modern tourism. Finally, Section 4 offers the context of an applied research concerning macro-economic effects of tourists visiting cultural heritage sites in Amsterdam. Based on an earlier study on meta-analysis and tourism multipliers and a new extensive data collection among tourists visiting Amsterdam, we will use micro-simulation and input-output analysis to identify the macro-economic effects of tourists visiting cultural heritage.

2. Research and Policy Issues

2.1. Supply and demand in tourism

Tourism has become an emancipated sector that is characteristic of a welfare society in which discretionary income and leisure have assumed a prominent place in people's economic decisions. It is no longer a 'happy few' phenomenon, but an established phenomenon in most developed countries. Furthermore, the behaviour of tourists has changed rather drastically: from one single vacation (often at a relatively short distance) to multiple vacations of a shorter duration at relatively longer distances. The supply of tourist services has followed this trend: weekend city-trips, flexible tourist packages, short-term cultural visits etc. The tourist market has thus become a volatile market, with a rich choice among attractive amenities, packages and destinations. This has led to a fierce competition on the supply side, among tourist operators, travel agencies, the hospitality sector, and tourist destinations. It is noteworthy that the demand side of the tourist sector is rather heterogeneous, with many specific tourist preferences (e.g., sun and sea, nature, culture and history, tracking etc.). Consequently, we observe the emergence of many niche markets geared towards a tailor-made supply of services for a critical tourist with a highly flexible behaviour. The matching of

supply of and demand for tourist services calls for due insights into tastes, preferences and drivers of tourist behaviour, and would require the use of applied (computable) general equilibrium models, a development that is still in its infancy.

2.2 Time and space in tourism (congestion, seasonality, duration)

The tourism sector is characterized by fluctuations over time and space. Periods of overcapacity are typical for the tourist sector in a given year. The price mechanism is of course an instrument to balance supply and demand during peak periods, but since demand patterns are not flexible due to fixed holiday periods in many countries, a balance between supply and demand is hard to achieve. Space-time variation is thus a basic feature of tourism, even though flexible opening hours of tourist facilities may offer a partial solution Furthermore, design and implementation of ICT offering advanced tourist e-services may also be an effective instrument to smooth out wild fluctuations.

2.3 Competition and efficiency

Tourism has moved into a mature economic sector, with a strong competition among destinations and intermediary agencies. Consequently, tourism tends to become a competitive activity among regions who are forced to enhance their performance in order to attract more tourists and to increase their revenues (see e.g., Crouch and Ritchie 1999, Dwyer et al. 2000, Enright and Newton 2004, Pearce 1997 and Ritchie and Crouch 2000, 2001). A tourist destination (e.g., city, region or site) is often no longer seen as a set of distinct natural, cultural, artistic or environmental resources, but as an overall appealing product available in a certain area: a complex and integrated portfolio of services offered by a destination that supplies a holiday experience which meets the needs of the tourist. A tourist destination thus produces a compound package of tourist services based on its indigenous supply potential (see Buhalis 2000 and Murphy et al. 2000). In this context Dwyer et al. (2000) claimed that *"it is useful for the industry and government to understand where a country's competitive position is weakest and strongest..."* (p.10), while Enright and Newton (2004) reinforced this view, stating that *"…it is important to know how and why competitiveness is changing"* (p.777).

2.4 Sustainable development and externalities in tourism

The positive views on and sunny sides of tourism are sometimes overshadowed by dark clouds. There is a tension between the beauty of a tourist site shaped by a long historical and cultural tradition and the short-term revenues that are often expected from a commercially – oriented tourism policy where tourism is seen as a catalyst for economic growth. Consequently, the issue of sustainability is at stake here. Tourist sites reflect a wealth of positive externalities for society that are hardly incorporated in any market system, but the danger is that uncontrolled tourism causes a wide variety of negative externalities that may cause a structural and irreversible erosion of cultural assets (Amelung 2006). From this perspective, it is important to exploit and emphasize local identities and resources that may be instrumental in creating a balanced tourism development of an area. Tourism competitiveness among different destinations would then have to be positioned in the broader context of tourism sustainability, while still respecting the need for efficiency increase in the tourist sector (eco-efficiency, carrying capacity). It is evident that a balanced tourist policy calls for a professional and strategic management of tourist flows at both regional and national levels (see also Crouch and Ritchie 1999).

It also ought to be recognized that the tourist sector is characterized by a multi-faceted character, where next to the tourist sector in a strict sense also the building sector, the transport sector, the real estate sector, the energy sector and the hospitality sector play a central role. Given the leisure nature of tourism, the creativity sector (arts, communication, culture, high-tech services) is instrumental in developing a modern advanced tourist sector. An assessment of the various forces at work call for sophisticated evaluation tools, where also local communities should be involved in participative forms of planning.

2.5 Cultural heritage in tourism

Cultural heritage is a stable asset in any tourist destination and less subjected to seasonal fluctuations caused by weather and climate. A significant part of the cultural history of our world is mirrored in human-made remainings from the past with a unique and great social value, often coined cultural heritage.

This is a broad concept that does not only comprise individual assets such as castles, museums or churches, but also complex and compound assets such as urban districts, historical landscapes and so on. In a broader sense, local resources be it natural or immaterial human resources map out the history of the local cultural endowment. These cultural resources have a high societal value, act as attraction forces for visitors and assume a prominent place in sustainable development.

Cultural heritage is in many cities an important source of tourism. Tourism in our era is also subject to drastic changes. More people spend more money on more tourist trips, and more people go more often on a tourist trip or travel even longer distances. The modern transportation and communication systems have created the conditions for a mass tourism, in which cultural heritage plays a key role as an attraction pole.

At the same time, we witness that large-scale tourism may erode the foundations of local or regional attractiveness, as it may create negative externalities, such as pollution, noise annoyance, congestion, social tension and so forth. This prompts the question whether – through dedicated human resources – a smart mix of cultural heritage and local resources can be found that may ensure the fulfillment of sustainable tourism development conditions.

2.6 Ecology and tourism

Tourism takes often placed in a fragile ecological system. The environment is probably one of the most important contributors to the desirability and attractiveness of a destination. Scenic sites, amenable climates and unique landscape features have an important influence in tourism development and the spatial distribution of tourist movements. Consequently, sustainable development, which for the purpose of this paper can be defined as *"development that meets the needs of the present without compromising the ability of future generations to meet their own needs"* (Eber 1992, p. 1), is required in order to preserve the environment as an asset for the tourism industry. Thus, some researchers suggest that there may be a symbiotic relation between tourism and the environment (Mathieson and Wall 1982, p. 96).

However, tourism has been responsible for a great number of environmental problems. The major problems arise because the environment (at least in the short term) is a zero-priced public good, and as with any zero-priced good, is subject to excess demand and over-utilization. This over-utilization of the natural resources, especially during the peak periods of tourist activity as well as often ill planned tourism development, have provided a number of examples where tourism is in conflict with the environment (Mathieson and Wall 1982, p. 101).

Consequently, the nature of the tourism-environment relationship is quite difficult to analyze and the estimation of environmental impacts associated with tourism development is an extremely complex issue. Clearly, one of the reasons that tourism stands out as an export industry which creates environmental problems is because of the 'visibility' of the consumers who must visit the destination in order to consume the industry's output. Indeed, tourism seems to receive more than its fair share of criticism from the environmentalist camp. Islands have sometimes been devastated by mining industries with little regard to environmental preservation, whilst the possibility of increasing tourist numbers meets with growing concern. Any form of economic development will bring with it economic, environmental and socio-cultural change and the damage which currently sits on the doorstep of the tourism industry must be kept in perspective.

2.7 ICT and tourism

Tourism plays a critical role in local economic development in many countries and is an important constituent of the emerging global network society, which is in turn stimulated by the modern ICT sector. The Internet plays an indispensable role in international and national tourism and will most likely become the critical tool for tourism in the future. The introduction of ICT in recent decades has created new opportunities for the tourist attractiveness of remote and peripheral areas, which nowadays also have a virtual access to major centres of tourist origin. This also leads to service competition among tourist facilities in areas of destination, where firms are increasingly involved in global competition (even when they belong to the SME sector).

The past few decades demonstrate a continuously growing trend in modern societies towards long-distance tourism. This trend has been to a large extent the result of:

- A steadily increasing income available for tourist activities;
- An increase of the time available for such purposes;
- Greater mobility of people due to the shrinkage of distance resulting from new technological developments in the transportation sector (mainly the airline sector);
- The expansion of the transport system towards new destinations;
- People's changing behavioural patterns and lifestyles connected to travelling, due to increasing internationalization trends in the information era;
- Logistic developments of the ICT sector.

The introduction of the various ICT applications related to the tourism sector opens new horizons for the introduction of new tourist services of either existing or new emerging tourist resorts in peripheral areas. As a result, the position of these resorts in the tourist market will be strengthened. The need for an updated network infrastructure, modern telecommunications systems and a skilled labour force is of the utmost importance in the context of these applications.

2.8 Transport and tourism

Tourism implies by definition geographic mobility and hence physical travel. When the first tourists – following Darwin's footsteps – visited the Galapagos Islands, they witnessed a breath-taking view on a rich flora and fauna. Nowadays, visitors are discouraged to visit this island group, as their presence may endanger the fragile ecosystem on these islands. This tension between goods and bads is coined the tourism paradox. A glaring example of a recent tourism paradox is the sudden rise in tourists' visits to Greenland, – following Al Gore's awareness campaign – where many visitors want to watch the rapid decay of the historical icebergs, without recognizing that their long-distance trip by airplane – followed by a ship of helicopter – causes an additional CO_2 emission that may accelerate the current unsustainable development of the polar icecaps.

Vulnerable cultural amenities and archaeological sites all over the world experience similar problems. The streets of Venice are flooded with tourists during the summer season, a guided tour in the Colosseo in Rome is a nightmare in the high tourist seasons, and a visit to the Louvre in Paris means much irritation with more waiting than enjoying culture. Apparently, modern tourism is becoming an important socio-economic growth sector (with a lot of geographical mobility involved), but it creates many negative externalities of various kinds, in particular, environmental decay of travelling, congestion and extreme density in popular tourist sites, and decay in community values and in social cohesion.

2.9 Demography and tourism

The tourist market is a diversified market, that is clearly influenced by demographic developments. Ageing and migration are two prominent phenomena that act as drivers for tourist development. In a modern ageing society we observe a significant share of elderly people, healthy and wealthy, and they assume an increasingly larger share of various specific segments of the tourist market. In many countries we also witness a rising flow of foreign immigrants, and this phenomenon will also exert a significant impact on international tourist flows. International tourism follows the patterns of the international division of labour between developed and less developed regions of the world. This division increases the dependence of the less developed countries or regions to a considerable extent, since tourist demand has been largely based upon the cyclic fluctuations of the economies of developed countries. This type of control relationships is becoming even stronger in cases where the tourist market is controlled by foreign travel mechanisms – tourist operators and large hotels.

2.10 Management and planning of tourism

It is evident that research on and planning for cultural tourism in the context of local sustainability is a challenging task that will call for due attention from the side of the research and planning community. Which pathways would have to be followed to arrive at a mature research methodology for this fascinating field?

First of all, it is striking that a fruitful development of the field of culture, tourism and local sustainability is severely hampered by the lack of a systematic information architecture, which would form the basis for operational data bases that might include cornerstones for comparative study and monitoring of sustainable pathways.

Next, tourism, leisure-time choice and sustainability action are a matter of human behaviour. The driving forces and impediments of the choices of tourists in regard to culture and sustainability however, are not well understood and call for thorough investigation, both conceptually and operationally.

The way visitors value a certain cultural asset and make choices regarding their behaviour on local sustainability is another research issue to be taken very seriously. Demand studies, experimental choice analysis, contingent valuation studies or conjoint analysis combined with focus groups have proven to deliver exciting results, but are still making a fragmented methodological impression.

Another important issue is related to evaluation studies on cultural tourism from the perspective of sustainable planning of local socio-cultural heritage. The field of evaluation in urban sustainable planning is vast, but is still exhibiting a patchwork of mutually non-consistent pieces. Solid evaluations research would be highly beneficial to the research and planning community in the cultural tourism field.

And finally, there is a need for solid applied work, in the form of systematic spatial impact assessment, policy effect studies and community impact studies, strategic scenario analysis and visioning experiments, comparative case study analysis, and meta-analysis and value transfer studies. There is still a vast area to be discovered that may be instrumental in a better understanding of and planning for sustainable planning in the cultural tourism sector.

3. Research Methods in Modern Tourism Research

The research agenda of the tourism sector is vast and multi-faceted. Modern tourism research is – in contrast to the past where many descriptive and / or anecdotical issues were dealt with – increasingly based on a quantitative research methodology, in the spirit of research in modern economics. But the specific nature of tourism issues calls for a specific emphasis on various dedicated research methods. In the remainder of this section we will address in particular 10 research methods which are commonly or frequently deployed in tourism research.

3.1 Input-output analysis

The use of input-output models in estimating economic impacts of recreation and tourism has increased considerably in the past decades because of their ability to provide accurate and detailed information and the ease of interpreting the results (Fletcher, 1989).

The basic information dealt with in input-output analysis concerns the flows of products from each industrial sector considered as a producer to each of the sectors considered as a user (Miller and Blair, 1985). When the demand changes in one of the sectors, this can affect many other sectors as well, especially when they deliver or buy intermediate products from the sector concerned.

Multipliers can be seen as summary statements of predicted effects of changes in demand (Armstrong and Taylor, 2000). They are based on the estimated recirculation of spending within the region; recipients use some of their income for consumption spending, which then results in further income and employment (Frechtling, 1994).

Multipliers vary across different sectors of the economy based on the mix of labour and other inputs and the tendency of each sector to buy goods and services from within the region (hence less leakage to other regions). However, because tourism activities and spending does not take place in one sector but in a combination of sectors (e.g. the hotel sector, the retail sector and the transport sector), no such thing as ‘the tourism multiplier’ exists. However, in general, because tourism-related businesses tend to

be labour-intensive, they, often have larger induced effects, because of household spending, rather than indirect effects (van Leeuwen et al., 2009).

3.2 Travel cost methods and hedonic price models

What is the value attached by visitors to a tourist site or tourist good? This question has been a source of research on tourism and recreation in the past decades. The travel cost method has tried to offer a simple answer to the previous question: the visitors' value given to a tourist good is determined by the total sacrifices made by the tourist to visit the good concerned. These sacrifices can be translated in monetary terms and include in particular travel costs, entrance fees, accommodation and living costs, and remaining expenditures related to that particular tourist visit. Clearly, this method has some limitations, as the volume and intensity of flows is determined by information on the good at hand (e.g. through marketing or e-services), the accessibility to the good, the distance travelled, congestion in the area etc., so that an unambiguous value is hard to determine.

Another method that has gained popularity over the past decades is the hedonic price method. This market-based method aims to assess the value change in real estate as a result of positive or negative spatial externalities, e.g. caused by an ecologically precious area or a cultural amenity of great interest.

3.3 Discrete choice models

The basic concept of discrete choice analysis is the modeling of a choice from a set of mutually exclusive and collectively exhaustive alternatives (Ben Akiva and Lerman, 1985). Generally, the principle of utility maximization is used. This means that, for example, a decision maker would select the alterative policy option with the highest utility among those available at the time the choice is made. An operational model consist of parameterized utility functions in terms of observable independent variables and unknown parameters, with their values estimated from a sample of observed choices made by the actors.

3.4 Stated preference methods

Stated preference methods are micro-based research methods based on artificial questions or choice possibilities where economic actors have to indicate how much they value a (change in a) certain economic good. By using methods from experimental psychology, it is possible to extract from such answers the monetary willingness-to-pay of agents (or alternatively, their willingness-to-accept). This approach has gained much popularity in ecological economics, where it is usually showing up under the name contingent valuation method. Based on a range of artificial questions on varying conditions, the interviewee is asked to express his opinion on the financial sacrifice (or benefit) in relation to the presence of a given good. This method has a great practical potential in tourist economic research and has gained mc popularity in recent years.

3.5 Meta-analysis

Meta-analysis can be defined as the 'study of studies' (Glass et al., 1981). It refers to the statistical analysis of individual studies with the same research question in order to integrate the findings. In meta-analysis, outcomes from a collection of studies are combined in order to draw general conclusions. It was initially applied in the medical and natural sciences, where it was used to compare the result of (semi-) controlled experiments. Meta-analyses can be performed in almost all thinkable research fields. Baaijens et al. (1998) and Brander et al. (2007) studied tourism-related subjects.

Meta-analysis is very useful when there is a need to systematize results that differ in magnitude and sometimes in direction. The problem of different studies resulting in different answers is particularly problematic for decision makers who are actually trying to use existing research as a basis for decisions (Holmgren, 2007). One reason for different outcomes is that different variables are taken into account to answer the same research question. Especially in economics, the effect of several variables is often considered simultaneously which results in different outcomes when the set of independent variables are not the same. Also the scale level can affect the results: the effect of tourism on a national level will be different compared with the effect on a city-level. In a meta-analysis all the characteristics of a study are taken into account together when comparing the results.

3.6 Micro-simulation methods

In micro-simulation modelling, the analyst is interested in information relating to the joint distribution of attributes over a population (Clarke and Holm 1987). In these models, agents represent members of a population for the purpose of studying how individual (i.e. micro-) behaviour generates aggregate (i.e. macro-) regularities from a bottom-up approach (e.g. Epstein 1999). This results in a natural instrument to anticipate trends in the environment by means of monitoring and early warning, as well as to predict and value the short-term and long-term consequences of implementing certain policy measures (Saarloos 2006).

In the tourism literature, it is often mentioned that measuring demand is obstructed by the lack of suitable data, and that the number of studies aimed at modelling tourism behaviour is limited. Today, we notice an increasing availability of micro-data, however, often the information is incomplete or available at different geographical levels. A particular advantage of micro-simulation modelling relates to data linkage (coupling). Often, at a low geographical level, the data availability is relatively poor. Provided that there is a link through at least one attribute, then different data sets: for example, questionnaire results and census data at different geographical levels, can be included in the same simulation exercise. This allows the models to be driven by new variables such as household income and expenditure (Ballas et al. 2005).

Another advantage of micro-simulation is the possibility to incorporate individual behaviour and micro-processes in the model and to use theories of this behaviour (Rephann and Holm, 2004). It provides a practical method to implement probabilistic models (such as logit) at the level of the individual. The heterogeneity of the observations (e.g. by questionnaires) can be fully represented and maintained during a simulation experiment. At the same time, the results can easily be aggregated to the level suitable to the question at hand.

Not many micro-simulation models related to tourism are available. One notable exception is the study of Lundgren (2004) in which information from the Swedish Tourism Database was integrated into the spatial micro-simulation model SVERIGE by means of a separate module. The module enables the simulation of the effects of changes in the Swedish population on the size and direction of tourism flows. Furthermore, the adjusted SVERIGE micro-simulation model allows for the analysis of possible adjustments in the direction of tourism flows by changes in the environment with respect to the location of tourism attractions. In addition, van Leeuwen and Nijkamp (2009) developed a static micro-simulation model that simulated visitor flows in Amsterdam.

3.7 Evaluation methods – multicriteria analysis

On the public policy side there is an increasing interest in operational evaluation methods that can help decision-makers to take balanced decisions in the tourist sector, e.g. in terms of public invest plans on tourist facilities. Tourist facilities do normally not only have a financial-economic dimension, but also a geographical, ecological and cultural dimension. For that reason, modern evaluation methods – such as multicriteria analyses – have gained much popularity. They are able to judge the relative merits of alternative choice options, by simultaneously considering (socio-)economic, financial, ecological, local, cultural or historical components that are translated into operational judgment criteria. There is at present a wide variety of multicriteria methods available which all serve to provide assistance to multidimensional choice problems. These methods have also extensively been applied in the tourist sector.

3.8 Data Envelopment Analysis

Data Envelopment Analysis (DEA) is a tool from industrial economics and organization that serves as a benchmark tool for assessing the most efficiently operating firm or unit. It has a long tradition in industrial mathematical programming and has found thousands of applications in the business sector over the past decades. In more recent years, it has also found extensive application in tourism economics, in particular, in comparative studies on the hospitality sector (e.g. hotel management), in the transportation and tour operator sector, and in the attractiveness of tourist regions. DEA has grown into a mature and practical research instrument in tourism economics.

3.9 Multivariate analysis of tourist data

Multivariate analysis techniques can be classified into two major categories. These are dependency techniques and interdependency techniques. The former consist of techniques in which a variable or a set of variables is identified as the dependent variable that is being predicted or explained by other variables, identified as the independent variables. Multiple regression is an example of a dependency multivariate technique. In contrast, in the case of interdependency techniques there is no single variable or set of variables identified as being independent or dependent. Interdependency techniques involve the simultaneous analysis of all the variables in the set (Chandra and Menezes, 2001). Cluster analysis or factor analysis are examples of an interdependent technique. Factor analysis, for example, can be used to analyse interrelationships between a large number of variables, and to explain these variables in terms of their common underlying dimensions. The main purpose of factor-analytic techniques is to reduce the number of mutually correlated variables, and/or to detect underlying patterns or a structure in the relationships between variables.

3.10 Equilibrium analysis

Tourism is an emerging, but also 'normal' economic sector. It is driven by the laws of demand and supply, although it has various peculiarities, such as seasonality, forced travel, ecological attractiveness, and so forth. Prices may be seen as critical parameters to match supply with demand, but the tourism sector will always be characterized by over- and under capacity. Economic equilibrium models may be helpful to identify under which conditions demand and supply of tourist services may be balanced, but the practical reality is such that equilibrium in a structural sense may be hard to achieve. CGE models may be instrumental in identifying possible market-equilibria through simulation experiments, but the operational character of these experiments is still limited.

4. Macro-Economic Effects of Tourism and Cultural Heritage: an Illustration

4.1 Literature review

Over the last decades, tourism has become a major activity in our society and an increasingly important sector in terms of economic development (Giaoutzi and Nijkamp, 2006). Various national, regional or urban welfare developments are critically dependent on tourism (e.g. Switzerland, Bali Venice etc.). Higher incomes and a greater amount of leisure time, together with improved transport systems have resulted in a growing flow of tourists, travelling more frequently and over longer distances. In addition, while it was concentrated in a few world cities and sites, tourism is becoming increasingly global, incorporating new destinations (Coccossis, 2008).

Cultural heritage is in many cities an important source of tourism. However, at the same time large-scale tourism may erode the foundations of urban attractiveness, as it may create negative externalities, such as pollution and congestion. Furthermore, cultural heritage may be a stable source of economic revenues for the city, but it may also be subjected to a sudden decay, e.g. by earthquakes or world economic crises. The demand for cultural heritage forms a chain between the urban past and urban future, and it has to be managed as an important asset, both for economic growth and for sustainable development (Fusco Girard et al., 2008).

In this section, we look at the relative importance of cultural heritage visitors for the economy of Amsterdam. We use the insights from an earlier study from van Leeuwen et al. (2006) in which a meta-analysis has been performed on tourism multipliers. As multiplier values reflect the size of the multiplier effect, with respect to a specific feature of the economy such as income, output or employment, these values help us to learn something about the magnitude of tourist expenditures. We combine these insights with insights obtained through a micro-simulation of Amsterdam's cultural heritage visitors. A basic information source we used for the empirical analysis is a database of questionnaire results asking visitors about their preferences for cultural heritage together with their personal characteristics. This information has been collected during the European Research project ISAAC.

4.2 Input-output multipliers

As described earlier, the basic information dealt with in input-output analysis concerns the flows of products from each industrial sector considered as a producer to each of the sectors considered as a consumer (Miller and Blair, 1985). Multipliers can be seen as summary statements of predicted effects of changes in demand (Armstrong and Taylor, 2000). They are based on the estimated recirculation of spending within the region; recipients use some of their income for consumption spending, which then results in further income and employment (Frechtling, 1994).

The size of the multiplier depends on several factors. First of all, it depends on the overall size and economic diversity of the region's economy. Regions with large, diversified economies which produce many goods and services will have high multipliers, as households and business can find most of the goods and services they need in their own region. Also the geographic scale of the region and its role within the broader region plays a role. Regions with a large geographic coverage will have higher multipliers, compared with similar small areas, as transportation costs will tend to inhibit imports since imports are seen as leakage and have a negative effect on a multiplier. Regions that serve as central places for the surrounding area will also have higher multipliers than more isolated areas. Furthermore, the nature of the specific sectors concerned can have a significant effect. Multipliers vary across different sectors of the economy based on the mix of labour and other inputs and the tendency of each sector to buy goods and services from within the region (hence less leakage to other regions). Tourism-related businesses tend to be labour-intensive. They, therefore, often have larger induced effects, because of household spending, rather than indirect effects. Finally, the year of the compilation of the input-output table should be taken into account. A multiplier represents the characteristics of the economy at a single point in time. Multipliers for a given region may change over time in response to changes in the economic structure, as well as to price changes (Stynes, 1998). In the meta-analysis undertaken in this study, we look at output multipliers. The reason for this is that, in the sample of studies that we found, these multipliers are most often used.

4.3 Data Analysis of Tourist Multipliers

In an earlier study, we performed a meta-analysis of tourism multipliers (van Leeuwen et al., 2006). We used 32 case studies from 27 publications, which contain estimates of tourist multipliers including a (type II[1]) output multiplier. A precondition was that the multiplier had to be derived with the help of input-output analysis. Also a (brief) description of background factors concerning, for example, the area and the tourist activities had to be given.

Interesting results for this article are, first of all, that we found that, related to the area under research, multipliers concerning countries are higher on average than, for example, the average multiplier values of a city. This is partly because a city has to import a large part of its inputs, which lead to leakages. This also applies to a region or national park. However not only the size (here in terms of population) matters: the areas with the smallest population do not necessarily have the lowest multipliers. Nevertheless, the areas with a large population do have on average the highest multipliers.

When we look at the reason why tourists visit a specific destination, it appears that areas with tourists who want to enjoy the good weather are related to the highest output multipliers. An explanation for this could be that people who visit areas to enjoy the sun often do not travel around a lot, but stay in the village or hotel and spend all their money locally. On the other hand, visitors searching for culture have (relatively) small multipliers, possibly because they spend less on luxury products. From the data, it appears that areas with large expenditures have the highest multiplier values. However, this is partly related to the scale effect. When looking at expenditures per km², it appears that there is no clear linear effect: both areas with the smallest amounts of expenditures and those with the largest amounts have high multipliers.

When executing a meta-analysis, not only characteristics of an area are important, but also characteristics of the study in which the information was found. It appears that conference papers estimate, on average, the highest multipliers, whereas the scientific articles and policy reports give relatively low values. We also incorporate the year in which the data was gathered in order to build the input-output

[1] Type II output multiplier: (Direct effect + Indirect effect +Induced effects)/ Direct effect.

table. It appears that on average, the oldest multipliers are the highest and the newer ones the lowest.

From this analysis we could expect that the multiplier effects of tourists visiting cultural heritage in Amsterdam are not very high. First of all because we are looking at a relatively small area, Amsterdam city, furthermore, because we focus on tourists that are attracted by culture. In a second step, the output multipliers have been estimated by using a linear regression technique. The estimation results for the output multiplier equations can be found in Appendix A.

It appears among other things that the population density and the population size show positive coefficients with the output multiplier. Furthermore, in this broader context the 'attraction' sun has a significant effect on the output multiplier. Interestingly, also the dummy 'culture' has a positive sign. Apparently, when correcting for the kind of area and other characteristics, a positive relation is found. A reason for this could be that the expenditures for cultural heritage sites are more often re-invested in the local economy.

4.4 Estimation of macro-economic effects using micro-simulation

To estimate the macro-economic effects of tourism expenditures related to cultural heritage we need to know what the amount of expenditures is. From our questionnaire it is not possible to extract reliable information about the expenditures of tourists. Although, the tourists were asked what the expenditures per person were for the trip, excluding the costs of travelling, the results are not very plausible. The costs per day range from €2 million to €0 Euro per day. Also it is not possible to find any significant relationship between the purpose of the trip, age of the tourist or country of residence. Therefore, we have to apply micro-simulation techniques to obtain a detailed picture of the tourist population, necessary to know the expenditures of different kinds of tourists with different interests in cultural heritage.

When we have this detailed picture of the tourist population, we link it to the results of a report of ATCB (2008) describing the Amsterdam Visitors Profile that estimated the average expenditures of tourists according to the country of residence and according to the purpose of their visit. According to this research, even though the expenditure amounts vary between different 'types' of tourists, the structure of the expenditures does not differ very much, which is important for the multiplier.

Important components for developing a micro-simulation model are the availability of a micro-population with a large number of relevant characteristics, as well as the availability of statistics about the subject and location under research. In our applied research in Amsterdam, there is micro-population information available from local choice experiments, relating to both tourists and (visiting) residents. The detail in data availability from local sources is, however, also very important, in particular to be able to choose the best constraint variables (see later). This is only possible when there is statistical information available at the municipality level (or at an even lower scale) concerning all relevant variables. For our case study of Amsterdam, fortunately sufficient information was available. By performing a micro-simulation, we are able to develop a picture of the total tourist/resident population of Amsterdam, with their relevant characteristics. The tourists have been simulated at the municipality level.We only looked at visitors who stay for at least one night, which results in a total tourist population of around 4.9 million tourists. For the simulation, we used 4 constraint variables; the goal of the tourist (business or pleasure), the age, the education level and the country of residence of the tourist. Constraint variables are used to fit the micro-data to the real situation. They are (the most) important characteristics abstracted from a literature review and regression analyses. Each of the constraints must be present in both the base survey (micro-data set) and in other databases, in this case, several sources from O+S Amsterdam (2008), ATCB (2008), and Statistics Netherlands (2007). For the development of our micro-simulation model, the static deterministic micro-simulation techniques applied by Ballas et al. (2005a) and enhanced by Smith et al. (2007) were used. This deterministic method used to create the micro-population of tourists is a proportional fitting technique.

The result of the micro-simulation is a database of 4.1 million tourists that visited Amsterdam with several relevant characteristics. Besides the constraint variables goal of the visit, age, education level and

country of residence, we also know in which kind of cultural heritage elements they are interested and what they planned. This means a distinction can be made between cultural heritage visitors, that mainly planned to visit cultural heritage sites, and mix visors, that planned to do all kinds of things such as shopping, visiting cultural heritage sites and/or to enjoy the city nightlife. Table 1 shows the results of the micro-simulation ('CH' means they are interested in cultural heritage, 'mix' in a mix of attractions), together with the expenditures per day obtained from the ATCB research (2008). This results in the total expenditures of tourists attracted by cultural heritage.

4.5 Tourism multipliers for Amsterdam

Now it is possible to estimate two tourism multipliers for the city of Amsterdam: one for the tourists that are mainly interested in cultural heritage, and one for the tourists that are also interested in shopping and the nightlife of Amsterdam.

It is not possible to use the regression model to estimate the output multiplier of Amsterdam. A reason for this is that the number of visitors and expenditures is relatively high compared to the (very) small population of Amsterdam, namely only 800,000 inhabitants. Therefore we will use the result from an article written by van Limburg (1997) who estimated a tourism output multiplier specifically for Amsterdam of 1.41. This figure is quite comparable to multipliers for cities found in other studies (which range from 1.18-1.75). When we keep everything else constant, but only assume that cultural heritage visitors' spending generate 0.103 more than mix visitors we have two multipliers: 1.41 for mix visitors and 1.51 for cultural heritage visitors. If we then calculate the macro-economic effects of cultural heritage visitors and mix visitors, we find a total effect of 3.2 billion Euros, of which almost 1.4 billion Euros by tourists that mainly intend to visit cultural heritage related sites (see Table 2).

TABLE 1

Expenditures of tourists in Amsterdam that stay overnight

Country of residence	Goal	Attraction	Number of days	Expenditures per day (€)	Total expenditures (million €)
Netherlands	Business	CH visitors	792,653	139	110
		Mix visitors	77,321	139	11
	Holiday	CH visitors	478,311	112	54
		Mix visitors	388,542	112	44
Germany	Business	CH visitors	210,82	126	27
		Mix visitors	99,242	126	13
	Holiday	CH visitors	257,443	102	26
		Mix visitors	222,331	102	23
UK	Business	CH visitors	363,354	177	64
		Mix visitors	467,493	177	83
	Holiday	CH visitors	658,927	143	94
		Mix visitors	1,833,080	143	262
USA	Business	CH visitors	181,626	190	34
		Mix visitors	687,322	190	130
	Holiday	CH visitors	556,512	153	85
		Mix visitors	903,558	153	138
Other	Business	CH visitors	642,08	154	99
		Mix visitors	785,693	154	121
	Holiday	CH visitors	2,564,000	124	318
		Mix visitors	3,992,314	124	495
Total		CH visitors	6,705,726		912
		Mix visitors	9,456,896		1,319

TABLE 2

Direct and indirect effects of tourism in Amsterdam

	Direct effect (million €)	Indirect effect (million €)
CH visitors	912	1,376
Mix visitors	1,319	1,86
Total	2,231	3,236

This means, that according to this estimation, tourists that are mainly interested in cultural heritage, account for 41 per cent of the direct effects, and for 43 per cent of the indirect effects. Obviously, this is an important part of the total expenditures, which means that cultural heritage is very important as well.

In retrospect, a meso- or macro- economic impact assessment of tourist expenditures in most regions is of utmost importance for a solid policy analysis. Clearly, in addition to standard economic analysis frameworks, also complementary frameworks have to be used viz. a quantification of tourist externalities (e.g. crowding-out effects, ecological damage etc.). This could be part of a new research agenda.

5. Conclusions

The tourist sector is a dynamic sector that has gained in importance in the past decades. It is stimulated by socio-economic changes (leisure time), technological conditions (e-services), transportation developments (world-wide accessibility of many places), demographic condition (ageing) and economic conditions (emerging welfare societies). Regions and cities try to play a competitive role in this field, as they aim to attract a large share of (inter)national tourist flows to their locations. Marketing, provision of high-quality facilities and supply of e-services are critical success factors in gaining a favourable position on the tourist market.

In this article we highlighted ten important issues in tourism research, as well as ten operational research methodologies to explore these issues. The empirical illustration which focused on macro-economic effects of cultural heritage visitors in Amsterdam showed how a combination of meta-analysis, micro-simulation and input-output analysis resulted in the conclusion that tourists that are mainly interested in cultural heritage, account for 41 per cent of the direct effects, and for 43 per cent of the indirect macro-economic effects of the tourism sector in Amsterdam. Clearly, in addition to standard economic analysis frameworks, also complementary frameworks have to be used viz. a quantification of tourist externalities (e.g. crowding-out effects, ecological damage etc.).

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APPENDIX A

TABLE A.1

Regression equations of the output multiplier

Variable	Parameters
Constant	1.720***
Year of data (0= 1980)	-0.018**
Conference Paper (dummy)	0.012
Article (dummy)	-0.426***
Density (100 inh/km^2)	0.013**
Population (1E 07)	0.014**
Country (dummy)	0.191
City (dummy)	-0.139
National Park (dummy)	0.030
Expenditures (1E 07)	-0.015
Nature (dummy)	-0.07
Sun (dummy)	0.202**
Culture (dummy)	0.103
R^2	0.86
n	32

*** Correlation is significant at the 0.01 level (2-tailed).

** Correlation is significant at the 0.05 level (2-tailed).

* Correlation is significant at the 0.10 level (2-tailed).

Note: When looking at the correlation between the variables with help of a bi-variate Pearson correlation, we find that several variables are related. We find, for example, a positive significant correlation between population and area or visitors and expenditures. Therefore, the variables size of the area and number of visitors are excluded from the regression analysis.