Accounting for Tourism

The Tourism Satellite Account (TSA) in Perspective

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Proefschrift

ter verkrijging van het doctoraat in de Economie en Bedrijfskunde
aan de Rijksuniversiteit Groningen
op gezag van de Rector Magnificus, dr. F. Zwarts,
in het openbaar te verdedigen op
donderdag 18 juni 2009
om 13.15 uur

door

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geboren op 16 februari 1975 te Druten

Preface

The story of this book started with my work at the Central Bureau of Statistics of Aruba. Aruba is a small Caribbean Island which is blessed with a tropical climate, pearl white beaches and a blue sea. This "one happy island", as the Arubans like to describe their island, is very popular with visitors. In 2000 I got the opportunity to work and live in Aruba for a couple of years. My work consisted of developing and compiling the national accounts of this small island. Living and working their showed me that Aruba needs good statistics on tourism for their national policy.

Obtaining a PhD had crossed my mind a number of times after finishing my Masters Degree in economics. In Aruba I met Sam Cole, an English professor, who is connected to the University at Buffalo, State University of New York, in the United States and whose research in Aruba required national accounts data. He directed me to Professor Bert Steenge, then at the University of Twente – now at the University of Groningen. At the end of the term of my contract at the Central Bureau of Statistics of Aruba I was looking for a job, but found the possibility of getting a PhD. During my discussions with Bert Steenge we quickly came to the conclusion that tourism (Aruba is well known for it) and the national accounts would play a central role in my dissertation.

The importance of reliable, regular and comparable statistics on tourism is recognised by various international organisations such as the OECD, the European Commission and the United Nations World Tourism Organization (UNWTO). The Tourism Satellite Account (TSA) forms a kind of bridge between tourism and the national accounts. The TSA presents tourism statistics in monetary terms and is connected to macroeconomic indicators such as gross domestic product (GDP) and income per capita.

The work on the dissertation, of course, is not only mine. Many enthusiastic colleagues at work and in the field have assisted and supported me. First of all, I would like to thank Bert Steenge, who has been my main supporter and contributed to this work in many ways. Bert, thanks for all your guidance and supervision during these years. I treasure the many inspiring discussions and sometimes surprising excursions we have had. Without your encouragements and enthusiasm I could never have brought this thesis to a good end. Also thanks to Marietta de Waard for the many talks and good advice.

Further, I am grateful for the valuable comments from the members of 'de Beoordelingscommissie', Professor Duchin, Professor Boorsma and Professor Dietzenbacher, which helped to improve this manuscript.

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1. Introduction

1.1 Background

Tourism is not a new phenomenon. In Roman times travel for leisure was already taking place within the Mediterranean area. In the Middle Ages tourism at certain times gained massive proportions. Thousands of pilgrims travelled from religious motivations to well-known places of pilgrimage such as Rome, Canterbury, Jerusalem and Santiago de Compostela. In these cities an early kind of tourism industry was already established. Especially a city like Rome was highly dependent on the expenditures of pilgrims. The first reliable figures on the number of visitors are available for the years 1575 and 1600, when approximately respectively 400,000 and 536,000 pilgrims visited Rome (Pinelli, 2001, p. 11). In a normal year, i.e. a year without epidemics or other disasters, more than half the food which was transported to Rome, was consumed by visitors (Cerchiai et al., 2003, p. 1030). The importance of tourism for Rome was also acknowledged by the pope. The church was active in the construction of hostels and tried to make the roads to Rome safer (Hook, 2004, p. 65).

Mass tourism developed at the end of the 19th and in the 20th century. Travel for leisure within the country of residence made room for further travel to neighboring countries, especially with increased car ownership. The increase in wealth and improved transportation possibilities made travel feasible for many more groups. Motives for travel have also become more diverse compared to Roman times. People travel more for reasons such as cultural enrichment, shopping, relaxation and adventure. From the second half of the twentieth century, tourism has increased steadily throughout the world. Over the years, many publications have appeared discussing this remarkable type of growth, often focusing on particular years. Fletcher (1989), based on World Tourism Organization (WTO) data, mentions a total of 355 million international tourists, spending US$150 billion, in the year 1987, which represented an increase of 17 percent over the year before. WTO's successor, the United Nations World Tourism Organization (UNWTO)[1], estimated the total number of international tourism arrivals to be a staggering 808 million in 2005 (UNWTO, 2006).

Interpretation of such data requires broader perspectives, with special attention for long-run and geographical patterns. Py (2007, p. 27) gives, based on WTO data, the following figures of international arrivals and revenues; see table 1.1[2]. The data have been obtained from highly diversified sources and exhibit a high degree of aggregation. Nonetheless, they present a picture of a very dynamic industry that seems to be growing forever, though occasionally a decrease in growth rates can be observed.

Table 1.1
Arrivals and revenues of international tourism

	Arrivals	Revenues
	millions	*billions of US dollars*
1950	25.3	2.1
1960	69.3	6.9
1970	165.8	17.9
1980	278.1	104.4
1990	439.5	270.2
1995	540.6	410.7
2000	687	481.6
2001	686.7	469.9
2002	707	488.2
2003	694.6	534.6
2004	765.1	634.7
2005	802	678
2006	842	735

Source: Py, 2007, p. 27.

This trend of tourism growth is expected to continue worldwide with the further introduction of bottom priced flights and increased wealth in, e.g., the rapidly developing markets in Asia.

Tourism plays an increasingly important role in the economy of many countries. It contributes to economic growth and job creation in countries, and is an important source of securing foreign exchange (OECD, 2000, Introduction; WTO secretariat, 2001). Let me again present some numbers. In Norway, about 3 percent of the total volume of gross domestic product (GDP) and (also) 3 percent of total employment in each of the years 1993–'95 can be attributed to tourism[3]. In the United States economy tourism and travel is estimated at around 2 percent of GDP and 3 percent of total employment in 1992 (OECD, 2000, p. 243 and 264). In other parts of the world figures can be significantly higher. About 18 percent of GDP and 21 percent of total wages and salaries paid on the island of Aruba are related to tourism of non-resident visitors, which is inbound tourism (Van de Steeg, 2005a). In the Netherlands, on the other hand, tourism plays a smaller role compared to Aruba with about 3.5 percent of GDP and 439 thousand jobs or 395 thousand persons employed in the tourism industry (Statistics Netherlands, 2006)[4]. At the level of international organizations, tourism is often viewed as a promising area of economic activity that has become a structural part of poverty alleviation and sustainable development programs. In addition to the role tourism plays in the promotion of global competitiveness and international trade, it contributes to the creation of wealth and regional development. Tourism industries are perceived as growth sectors and continue to be considered as labour-intensive with low entry possibilities. Policy makers tend to view the development of tourism as a way to address unemployment and underemployment in their country (OECD, 2000, p. 127). The UNWTO is convinced of the relevance of tourism because 'of the

quantitative importance of this industry (in monetary and physical terms) and by extension of its role as an important economic factor in all the industries [5] that produce goods and services demanded by visitors' (WTO secretariat, 2001, p. 63).

Tourism generally has a positive image. For example, it enables visitors to experience new cultures and new environments. The interaction of cultures between visitors and the local population makes an exchange of knowledge, ideas and experiences possible. Local inhabitants without the means of travel are able to meet visitors from all over the world and develop a taste of other cultures. Globalization basically is a process in which geographical distance becomes a factor of diminishing importance in the establishment and maintenance of cross border economic, political and socio-cultural relations (Hirst and Thompson, 1996). International tourism contributes to the establishment of cross border interactions. Artists, chef cooks and designers are known to travel the world to gain inspiration for their creative work. They are looking for special scenery, food or folklore to inspire them in their creative process. On the other hand, the western or country-specific culture, such as political and religious views, customs and practices, and ideas on what is beautiful, are exported to travel destinations. There seems to be a tendency towards one world culture when looking at some visible icons of globalization such as jeans, McDonald's and Coca Cola. Tourism destinations tend to become more homogeneous. It does not matter on which beach one is sun-bathing, the same white sand, blue sea and skyline of hotels can be found. The fierce international competition between tourism destinations seems to produce similarities in products offered to visitors. This disappearance of unique traditional cultural values cannot solely be attributed to tourism but is also due to the increase in mass media and communications.

The exchange of cultures is often positive for improving insights in each others' customs and practices. The negative side is that economic differences between groups of people become more obvious. Before meeting the richer visitors, local inhabitants may have been happy with their situation in life and unaware of any wants. The republic of Maldives is located in the middle of the Indian Ocean and consists of about 1,200 islands of which 200 are locally inhabited. Being born on one of the local islands far away from the capital island may mean that the choices in life are already made. A boy can become a fisherman or work on a boat and a girl is most likely to spend her days on the island of less than one square kilometre looking after the children. The lack of choices in life is very much linked to the availability of education, health care, and other possibilities for personal development. The differences become more noticeable when the local population meets visitors, which appear to possess all the options in life. As a consequence, people might decide to give up their local life in quest of a better life by, for instance, moving to the main capital and trying their luck there. Tourism is blamed, with some justification, of contributing to the destruction of traditional cultural values and the degradation of the natural environment in a way which is often irreversible (Markandya, 2000, p. 145–158).

With more money to spend which is, 'technically speaking', the same as growth in disposable income, the demand to visit sites of special interest has increased throughout the world. Because the number of sites to visit is fixed 'in principle', the pressure on many sites is felt increasingly (Markandya, 2000, p. 145–158); there is only one South Pole, one group of Galapagos Islands and one Waddenzee. These sites harbour a unique environment, scenery, flora and fauna which cannot be easily copied or recreated. It has been known for quite some time now that tourism has a negative impact on the environment of certain areas (Fossati and Panella, 2000; Rey-Maquieira Palmer et al., 2005). The construction of tourist resorts and accommodations, the intrusion of tourists into nature reserves and the different kinds of pollution caused by tourists are harmful to natural environments and have a negative influence on biodiversity. The ski areas in the Alps, the natural coasts of the Mediterranean, and the coral reefs around tropical islands are just a few examples of areas where mass tourism is negatively effecting the environment.

There seem to be different ways in which a travel destination can develop. The focus can be on attracting as many visitors as possible, with its environmental, cultural and social implications. Benidorm and Loret La Mar have become synonymous for mass tourism with cheap travel and accommodation in tall buildings at the sea-side. These destinations are particularly popular with low-budget travellers half the year, and deserted the other half. However, there are alternatives. In an article in one of the Dutch newspapers this is illustrated (De Volkskrant, 2004b): in the 1970s the kingdom of Nepal became popular among hippies for its particularities, including hashish and mountainous backdrops. Nepal is still very popular with backpackers and known as a relatively cheap destination. Nepal is contrasted with the neighbouring kingdom of Bhutan. In Bhutan visitors are obligated to travel on a prepaid, pre-planned program; independent travel is not permitted [6]. This policy limits the number of visitors entering Bhutan. In Bhutan sustainable economic development is promoted which explicitly takes account of the natural environment and traditional cultural values. Visitors are, for instance, always accompanied by a guide, it is forbidden to chop down a tree without permission and the local population is obligated to wear traditional clothing [7]. This policy is reflected in the country's accounting practices. An indicator for gross national happiness has been introduced in the kingdom. In Bhutan the development of emotional wellbeing is preferred rather than mere economic progress. Gross national happiness replaces gross domestic product as a welfare measure. Gross national happiness consists of different indicators, which include human development, environmental, and cultural preservation (Priesner, 1999).

Bhutan thus provides an example of an active policy on tourism. Some countries try to deter mass tourism and focus on less but more well-to-do visitors. The advantage here is that the traditional culture and the environment are less affected. The country needs to invest less in airports, roads and other facilities. On the other

hand, low-budget visitors, such as backpackers, spend less per day compared to the richer visitors, but they sometimes stay for months and the money of backpackers generally goes straight to the local population (Saville, 2001; De Volkskrant, 2004a)[8]. The question arises what is best for the country. Apparently, there are many different aspects of tourism development; some of these aspects, such as economics and environment, perhaps opposing one another. This means there is a necessity for considering tourism in a systematic way, which clearly is not an easy task.

Tourism has many dimensions, not all of which are welfare enhancing. In general welfare refers to the satisfaction of human needs. Employment and an increase in spending money can contribute to the feeling of welfare, but welfare depends on more aspects than economics alone. Many aspects of welfare remain uncovered in what is typically an income measure such as economic growth. It is generally acknowledged that welfare is also dependent on non-priced products, such as the presence of a clear blue sky and a certain amount of leisure. Welfare actually is multidimensional and includes a sense of wellbeing, happiness and prosperity (Van de Ven et al., 2000). This is reflected in the debate on the notion of a green national income (GNI) as a possible alternative for today's standard measures such as gross domestic product (GDP). GDP is a standardized indicator which measures the economic performance of a country or region as total added value of production. Physical production is made equal to welfare. GNI takes the environment as a welfare generating economic good into account by correcting national income for environmental losses (Cobb and Cobb, 1994; Alfsen et al., 2006). On an international level the OECD has taken up the challenge in promoting the discussion on welfare and its measurement. Different indicators or sets of indicators for sustainable development are being used (Hass et al., 2002). The establishment of one welfare indicator such as the indicator of gross national happiness of Bhutan assumes happiness or welfare can be measured in one indicator. The one indicator idea is part of the international debate. Opinions differ, however, Statistics Netherlands holds the view that welfare and the broader concept of wellbeing should be measured using a set of indicators addressing various aspects of welfare (Van de Ven et al., 2000; De Haan et al., 2002; Van de Steeg et al., 2006). However, welfare is difficult to capture in any indicator or sets of indicators as it is experienced by anyone differently. Elements like the 'homogeneity' of the society enter the picture.

Related to this is the issue of sustainability, often interpreted in the sense that a society's success in achieving progress in the short term should not damage prospects for continued progress in the long term, the Brundtland Commission defines sustainable development as: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987, p. 8). In the Brundtland report three fundamental components to sustainable development are highlighted, namely economic growth, environmental protection and social equity.

Sustainable development policies should address all three components. For the recommendations of the Brundtland report to work, data is required for the calculation of indicators which can be used in policy making to produce a sustainable society [9].

Sustainability of tourism is a subject of increasing interest. The sustainable development of tourism plays an important role for countries with a significant tourism industry or interest in expending tourism to a significant level. Sustainable tourism is dependent on a wide range of statistics on tourism and environmental, cultural and social tourism related statistics [10].

Perhaps surprisingly, an essential question in all this is: "What is tourism?", or "How is it defined?". Everyone is a visitor at certain times. A trip to Paris to visit the Eiffel tower obviously belongs in the tourism category. A daytrip to Amsterdam to do some shopping and visit a museum or two is also tourism. However, this is already more difficult to classify because "shopping" is something people do almost every day. It may be difficult to see "tourism" in shopping. But what happens when the visitor lives in Amsterdam? Can one be a visitor in one's own country, in one's own town? There are several issues at stake here. Above all, there is the element of delimitation. Henry and Deane (1997, p. 536) express this as follows: "Tourism is referred to as an industry, but that is a misnomer. From the perspective of the tourist, he or she demands an extraordinary range of goods and services during the course of a holiday, or a visit to another country. The needs of tourists are not met by accommodation, transport, dining, and one or two other basics alone, but extend to such diverse areas as banking, medical and dental care, security, manufacturing, telecommunications, sewerage and hundreds of others. From the perspective of the supply side, some operators, such as a hotelier, see themselves as essentially in the tourism business. Others, such as a medical doctor or a postman, would of course, not. But, nevertheless, for that period of time in which they are working to meet the needs of the tourist, they are, in fact, a part of the tourist 'industry'".

The answer to such questions is complex and open to different interpretation. However, determining what belongs to tourism lies at the foundation for understanding this phenomenon. Here the need for a system of appropriate definitions is felt strongly. In addition, the definition to be adopted should have sufficient flexibility to be applicable in a large area, preferably, of course, all over the world. A visitor should be someone who is travelling, under certain conditions, for pleasure, business, health, education or other purposes. Tourism should comprise the activities of all these categories of visitors. The scope is, therefore, different from the common perception of tourists as including only those travelling for personal reasons.

The measurement of tourism demand i.e. tourism expenditure [11] is strongly related to the estimation of the role tourism plays in an economy. Models are constructed

on a regular basis to project future tourism demand based on variables such as prices, income of the visitor and current tourism arrivals. For these models to be useful there has to be a proper foundation, such as data on accurate tourism expenditure and other information. In later chapters the small Caribbean island state of Aruba will be introduced as an illustration of the ideas underlying this study. Interestingly, for the island of Aruba research on tourism demand has been undertaken in a previous study (Croes, 2000). In this study, Croes remarks that: 'the term tourism still lacks a generally accepted definition' (p. 26). He has made an effort to give an overview of the different definitions of tourism, thereby touching on different aspects of tourism. His definition of tourism is different from the one used in this study. Croes does not seem to specifically distinguish a visitor. Also, in the definition of tourism used by Croes a certain time limit, a night stay, has to be fulfilled for tourism to exist. In my view this severely limits the quantity of tourism in Aruba. Many cruises include a stop-over in Aruba ranging from a couple of hours to a day. In his study Croes seems to exclude cruise visitors because they do not stay overnight on Aruba. Cruise ships, generally, lie in port during the day and leave in the evening for the next destination. In my view, the introduction of an overnight stay and, therefore, excluding cruise tourism does not do justice to tourism in Aruba [12]. In this study a different definition of tourism is used and will cause some differences in results and conclusion between the two studies.

Tourism studies need a strong foundation in economic theory. Going back to basic theory, such a foundation can be found in the notion of a 'transaction'. It is the basic unit of economics as a science. It also is the basic unit in the accounting system underlying today's "System of National Accounts", SNA for short, which will be discussed further. A transaction according to the "System of National Accounts 1993" is an economic flow that is an interaction between institutional units by mutual agreement" (SNA93; UN et al., 1993, par. 3.12). An example of a transaction is provided in a situation where demand for a particular good or service has been met by corresponding supply. The product having been bought and sold should be well-defined, as well as the corresponding price. I also would like to recall the well-known statement by John Commons (1931, p. 652) "But the smallest unit of the institutional economists is a unit of activity – a transaction, with its participants. Transactions intervene between the labor of the classic economists and the pleasures of the hedonic economists, simply because it is society that controls access to the forces of nature, and transactions are, not the "exchange of products," but the alienation and acquisition, between individuals, of the rights of property and liberty created by society, which must therefore be negotiated between the parties concerned before labor can produce, or consumers can consume, or products be physically exchanged".

The transaction, i.e. buying the product always takes place in a certain context. Transactions usually take place between units which belong to larger units of classification such as industries and households. Industries considered here include

agriculture, light and heavy industry, the business and trading industries and governmental action fields.

There are no limits to the industries involved in tourism or with which visitors have a transaction. In fact, as pointed out earlier, the activities of tourism should encompass all that visitors do in preparation for a trip or while on a trip. It is not restricted to what could be considered as 'typical' tourism activities such as sightseeing, sunbathing, practicing sports, et cetera. Being a visitor is a transient situation, related to a specific trip or a specific visit. Once the trip is over, the individual looses his/her status as a visitor. Tourism is a *demand* concept. That is, it depends on the characteristics of the consumer if its expenditure is included in tourism expenditure. For example, the purchase of a carton of milk by an American resident visiting Amsterdam is considered tourism expenditure, while the purchase of the same carton of milk by a local resident is considered normal consumption. Nonetheless, certain conditions should be imposed. The travel of non-resident visitors in a country should, somehow, be limited in time, e.g. to less than a year. Also the visitor should not be paid, i.e. not compensated by the place visited.

In the following, other concepts are introduced. A further example can be found in the distinction between (being) resident and non-resident. The concept of residence is not based on nationality or legal criteria. A so called "*institutional unit*", which can be an individual person, household, company, et cetera, is said to be a resident unit when it has a centre of economic interest (household) in the economic territory of the country in question (SNA93, par. 14.8). In later chapters I will elaborate further on this concept of residence. The core is that statistics for the measurement of non-resident visitors are relatively straightforward to compile compared to statistics on resident visitors in their own country. It is not always easy to outline which part of the travelling of resident visitors within their country of residence should be included in tourism. Which domestic travel should be included in tourism? In practice different countries use different criteria for estimating resident travel as a tourism component. Canada has used 80 kilometres of distance before a resident is a visitor in Canada and the Netherlands uses 2 hours before a trip is classified as tourism. It is fundamental to define tourism in such a way that statistics on tourism of different countries or regions can be compared with each other.

Economic statistics for many industries have been collected for a number of years. This has taken place in the context of designing national policy measures, in compiling the national accounts, in academic model building, or otherwise. Over the years, certain classifications have been developed in the area of industries (International Standard Industry Classification (ISIC)), and products (Central Product Classification (CPC)). These classifications are based on a hierarchy with

levels of detail. The lowest level in the hierarchy contains the most detail. On the highest hierarchical level industries or products are aggregated in a limited number of groups [13]. The level of detail increases for each digit added to the classification: the industry classification "Restaurants" includes more detail when a distinction is made between snack bars, lunch rooms and full-service restaurants. The determination of the industry category of an enterprise is made using the share of value added earned in the production of products which are produced by the enterprise. The characteristics of the consumer are not part of this determination process. Therefore, a tourism industry is not a category in the standard classification schemes. This means that the statistical data which might be needed are present "in the system", but dispersed over categories that have been defined with other purposes in mind. It appears that the tourism industry is fragmented over the classic business activities, businesses operating in tourism are located on the complete spectrum of economic activities. Tourism policies are cross-industrial by nature because tourism is part of many activities in an economy, from government and households to businesses.

As stated, there is a clear and well-understood need for tourism and tourism issues to be approached in a systematic way. Policy makers need to balance the benefits of tourism, such as economic growth and employment creation, with the costs of tourism. These costs, for example, can be found in the negative effects tourism has on the environment, such as degradation of local flora and fauna, or socio-cultural structures such as the loss of folklore. Statistics on tourism have often been restricted to data on volumes of travellers, their socio-economic characteristics of the visitor, their nationality and/or country of residence, their length of stay, purposes of visit, the type of accommodation, hotel capacity and occupancy rates, and the availability of points of interests for visitors, to name a few categories. These statistics however, generally supply insufficient information on the *economic impact* of tourism, such as on total production and value added of tourism. They are certainly insufficient to develop a strategy for tourism. Policy makers should consider the benefits and expenditures of the chosen strategy. Countries and regions need a statistical system which produces statistics which can be used to benchmark their positions vis-à-vis other travel destinations.

Efforts have been made at the international and the national level to seek *more complete information regarding the whole set of activities relating to tourism*. Policy makers are interested in the economic aspects of tourism at the individual and branch level, i.e. the micro and meso level, and in the national and international context. The environmental and social implications of tourism need to be related to its economic aspects. In fact, there is a need for an integrated, complete and consistent framework in which tourism can be understood. This framework, ideally, also needs to be internationally standardized and recognized. Only then can internationally comparative statistics be compiled. Tourism has important

aspects such as its social, cultural and environmental dimensions. Within sociology, anthropology, environmental studies and the like there has been research on the impact of tourism on a population, population group, et cetera [14]. These studies approach tourism from different directions, conceptual frameworks and focus. The categories in these studies are designed differently, i.e. are not comparable. The statistics from different research areas often cannot easily be integrated into one framework which connects or relates these statistics. Economics has the advantage that many economic aspects such as production, consumption, exports, and expenditures are expressed in one unit of measurement, which is money. In economics in certain cases it is (already) possible to valuate environmental pollution and land use, while also the valuation of goods like safety is underway, although not without debate (Statistics Netherlands, 2003, 2007; De Haan, 2004; Kleingeld et al., 2006).

For the establishment of a more complete set of tourism statistics a structure is required. The question then arises, which structure to adopt. Following present developments, there actually is only one choice available, i.e. opting for the structure offered by the System of National Accounts. In this framework different aspects of the economy are measured, such as gross domestic product (GDP) and total consumption. The SNA facilitates in its framework the estimation of economic statistics which include tourism statistics. I shall discuss the SNA in further detail in chapter 2 of this study. However, at this moment it is useful to provide some information already.

The System of National Accounts is an excellent statistical basis for economic statistics. Its basis was developed before, during and after the Second World War. Particularly after the war, there was a desperate need for internationally comparable economic statistics. These statistics were in first instance required for determining the size and structure of the Marshall aid. Many European countries were heavily damaged and needed rebuilding. The USA decided to rebuild Europe as quickly as possible, and provided the means to do so [15]. Later, country contributions to international organisations had to be calculated on the basis of the size of a country's economy. In 1947, Richard Stone presented the first set of guidelines for the estimation of certain key statistics. In later stages these guidelines on national accounting developed into a complete handbook in "A System of Accounts" (UN, 1968). Since then, this handbook has been revised in "The System of National Accounts 1993" (SNA93; UN et al., 1993). This integrated system describes the economy of a country or region. The national accounts place macroeconomic indicators in perspective. Apart from measuring economic performance, the System of National Accounts 1993 (SNA93; UN et al., 1993) and the "European version" of the national accounts 'European System of Accounts 1995' (ESA95; Eurostat, 1996) include estimations such as consumption, imports, exports, savings and production by industries.

At a certain point a need was felt to *zoom in* on certain specific issues which are implicitly included in the national accounts framework but had to be viewed explicitly. Instead of expanding and overburdening the central framework, separate modules –the so-called satellite accounts- were developed for this specific purpose. Satellite accounts are connected to the main national accounting framework, sharing the definitions, concepts and accounting rules but are separated from the main framework in that specific issues can be made explicit. Satellite accounts also facilitate the incorporation of different aspects of welfare within the System of National Accounts (SNA). An example of one such extended framework is the 'System of Economic and Social Accounting Matrices Including Extensions' (SESAME) (Keuning, 1996; 1997). This is a modular information system which combines the central national accounting framework with social, environmental and other modules. The natural environment provides another example, with the introduction of the NAMEA-matrix (National Accounting Matrix including Environmental Accounts) as an outcome (De Haan, 2004; Keuning and Steenge, 1999). Such an extension has also been designed for tourism, i.e. the Tourism Satellite Account (TSA). The analysis of tourism using satellite accounts has substantial advantages. It makes it easier to relate the relevant economic variables to other variables from satellite accounts and to illuminate their relationships.

Let us now return to tourism statistics proper. As pointed out, tourism concepts such as tourism production and tourism consumption are dispersed throughout the national accounting framework. However, for policy purposes or for strategy design in tourism, tourism statistics need to be brought together. This means that (parts of) national accounting concepts need to be brought together to get a complete insight in the structure of tourism. This is a separate methodological step which requires special attention.

A large number of industries [16] supply, to a certain extent, goods and services to "visitors". The transactions in question therefore belong to the "tourism" industry. What belongs to tourism thus is determined by the fact if the consumer is a visitor, yes or no. Industries do not need to supply their complete production to visitors and therefore often belong only partly to the "tourism industry". *Implicitly* tourism production, consumption, employment, et cetera is already found in the System of National Accounts. Tourism *shares* are hidden in the more traditional industries such as retail, hotels and restaurants.

Data on international and national travel provides insight in developments in a country's tourism activities. The International Union of Official Travel Organizations (IUOTO) provided, from 1947 and onwards, a publication entitled 'International Travel Statistics' which included statistics on international travel movement and payments in various countries from year to year. In 1975 the IUOTO became the World Tourism Organisation (WTO) [17]. With this change, the coverage of the

statistics previously published was enlarged to also include data on the departures from each country of nationals and residents travelling abroad, and on domestic tourism. The increase in scope of the statistics was matched by a larger geographical coverage of countries providing data in the publication entitled 'World Travel Statistics' of the WTO (WTO, 1978). Establishing the WTO clearly was an answer to pressing problems faced by many countries and organizations caused by a lack of relevant and up-to-date statistics.

The Tourism Satellite Account (TSA) should also be seen in this light. It is the outcome of considerable number of coordinated efforts including international conferences and meetings starting from the 1970s. France already used the term satellite account at the end of the 1970s. With this term the accounting practices were designated that did not exactly fit into the System of National Accounts (SNA) but could be considered satellite sub-systems of SNA. In 1982 the WTO started the preparation of a document describing tourism in accordance with the mode of thought of the System of National Accounts (System of National Accounts, 1968). This document was presented to the Fifth session of the WTO General Assembly in New Delhi in 1983. This document is considered a general guideline for working towards international harmonization of concepts and statistics on tourism (WTO, 1999).

In 1993, the United Nations Statistical Commission adopted the "Recommendations on Tourism Statistics" which resulted from the 1991 Ottawa conference. This development meant a large push in the construction of the conceptual framework for the elaboration of the TSA. Tourism is made explicit in this *new tool*, which provides insights into the economic impact, structure and development of activities related to tourism. The increased importance of tourism for many countries, in combination with an intensification of competition between countries and regions to attract tourists, has led to an increased awareness of the role and impact of tourism. The new tool analyses tourism and tourism related employment, standardises and ensures the relevance of tourism statistics systems, increases consistency between the various systems in place at an international level, and creates awareness of the implementation of the tools and needs the results can fulfil.

In 2001 a number of international organizations, including the WTO, published a document entitled "Tourism Satellite Account: Recommended Methodological Framework" (UNSD et al., 2001; TSA: RMF for short). In this publication the concepts, definitions and accounting rules of the TSA were put forward. In 2003 the WTO 18) was transformed into a specialized agency of the United Nations and became the United Nations World Tourism Organization (UNWTO). This organisation aims to improve the effectiveness of tourism policies and policy-related measures and the existing means of evaluating these policies by introducing

relevant statistics. The UNWTO undertakes actions to increase awareness of the field, and began to participate in the general coordination mechanism of the agencies involved in supporting the compilation of tourism statistics. The goal of tourism statistics is to provide a consistent picture of the various aspects of tourism in terms of regularly compiled sets of data. The UNWTO does this by providing specialized expertise, special courses, publication of manuals, facilitate international debate on concepts and methodology by organising meetings and conferences, et cetera.

The need for extensive macroeconomic comparative statistics on tourism has led the UNWTO and other organisations, such as the OECD and United Nations Statistical Division, to develop a framework for tourism which is connected to the SNA. This framework, now known as the TSA, consists of a set of 10 recommended tables. In these tables the share of tourism in production, consumption, employment, government income, fixed capital formation, and so on, is registered. The set of tables largely encompasses demand by visitors and supply of products by producers and relates them to other relevant data such as investment, employment, balance of payments, government revenues, et cetera. The recommended tables are:

Box 1.1 set of TSA: RMF recommended TSA tables

1. Inbound tourism consumption (Visitor final consumption expenditure in cash);
2. Domestic tourism consumption (Visitor final consumption expenditure in cash);
3. Outbound tourism consumption (Visitor final consumption expenditure in cash);
4. Internal tourism consumption;
5. Production accounts of tourism industries and other industries;
6. Domestic supply and internal tourism consumption;
7. Employment in the tourism industries;
8. Tourism gross fixed capital formation of tourism industries and other industries;
9. Tourism collective consumption;
10. Non-monetary indicators.

The first 3 tables in box 1.1 above, inbound tourism consumption (Visitor final consumption expenditure in cash), domestic tourism consumption (Visitor final consumption expenditure in cash) and outbound tourism consumption (Visitor final consumption expenditure in cash) measure the amount of goods and services consumed by visitors. The difference between the three tables concerns residency of the visitor and country of destination. The first table concerns non-resident

visitors while the second and third table both concern resident ones. The country of destination in the first two tables is the country of reference and in the third table the rest of the world. In the fourth table of the TSA framework, internal tourism consumption, statistics on inbound and domestic consumption are combined.

Continuing, there is the production of the goods and services which are being consumed by visitors, resident and non-resident. In the fifth table, production accounts of tourism industries and other industries, this production for each industry category is shown. The reconciliation between production and imports on one side and consumption and investment on the other is one of the main distinguishing elements of the national accounts. In the TSA tourism production and tourism consumption are being confronted and reconciled in the table on domestic supply and internal consumption. This reconciliation takes place in the sixth table of the set of tables, domestic supply and internal tourism consumption.

Then there are three tables which address specific aspects of tourism such as employment in the table 'employment in the tourism industries', investment in the table 'tourism gross fixed capital formation of tourism industries and other industries' and the consumption of special government services in the table 'tourism collective consumption'. The tenth table presents a number of non-monetary indicators of interest such as occupancy rate, the number of arrivals and the number of rooms.

The TSA offers policy makers an overview of tourism in relation to industries and sectors. It provides a profound understanding of the structure of the tourism industry and a conceptual framework that can, at a later stage, be adapted to calculate the socio-economic and environmental-economic impact of tourism at the regional level. The TSA presents a basis for policy analysis in terms of issues relating to tourism economy, as well as for the design of models, growth analysis and evaluating productivity in the business sector. As a consequence the TSA may serve as an important tool for policy makers in developing a tourism strategy. Already in some countries, such as Canada, the United Kingdom and Austria, tourism statistics are part of the regular statistics available for policy making. In these countries various parts of the TSA framework has been implemented (Statistics Austria and WIFO, 2001; Lapierre and Hayes, 2003; McNicoll, 2004; Jones et al., 2004). The application of the TSA framework to the situation in various countries and the lessons learned from these applications provides continued material for TSA development; the methodology of the TSA framework is tested in, and improved by, each experience.

Despite these encouraging developments, the TSA can by no means be considered a finished product. Rather, it should be seen as work in progress. For example, there are a number of TSA tables, which definitely need further methodological development before countries should start compiling them. This concerns primarily

the tables on tourism gross fixed capital formation and tourism collective consumption. A number of countries, such as Norway, Spain and France, have attempted to estimate tourism gross fixed capital formation. Various methods have resulted from these exercises. However, the outcome is not one single method which supplies comparative statistics. To continue, to my knowledge the estimation of tourism collective consumption for the Netherlands is among the first. This means that there is not much experience in compiling these statistics and testing the methodology. In fact, the compilation of the tourism gross fixed capital formation table and tourism collective consumption table for the Netherlands, presented in this study, leads to specific methodological problems and issues. As I shall make clear later, the precise interpretation of the compilation practices for these tables is being debated. Actually, at this moment, a certain amount of scepticism is warranted, as I hope to show in the course of this study.

So, the TSA is, very much, work in progress. This also leads to a further point: Does the TSA framework, by itself, offer sufficient "structure" to address the important issues that many countries face regarding their tourism industry? In my view, it does not. In fact, for many countries the current TSA framework is lacking valuable information. In this study I will propose a possible extension of the current TSA framework as a whole towards a more comprehensive satellite account [19]. This proposed extension will link the different transactions present in the TSA in a systematic fashion. A transaction is connected to some specific aspect of economic life, such as the production or generation of income (transaction compensation of employees). Various macroeconomic indicators result from different accounts. The interactions between tourism and other players inside the economy and abroad are made visible in this extension. The other players, such as companies, government organisations and households, are grouped in institutional units [20]. For these institutional units accounts are set up which register the different transactions or flows. These institutional sector accounts are part of the main framework of the System of National Accounts. In the institutional sector accounts the production of goods and services, generation of income, distribution of income and accumulation of wealth is shown in monetary terms. In these accounts the interactions between economic sectors are presented, such as households, corporations, financial corporations and the government. Extending the TSA towards the institutional sector accounts will incorporate the interaction between tourism and the rest of the economy and the further distribution of income earned with tourism. It will be visible for a country what it earns from the rest of the world and how much of the tourism earnings leaves the country in terms of imports, dividends and interest payments.

I am not saying that this is the only way to go. It is also possible to regionalise the TSA or make a very detailed TSA with industries broken down in (very) low levels of activities. The latter type of extension establishes a breakdown of production in the direction of the activity level. The production of each activity will be limited in

the kind of outputs and therefore augments the input-output modelling possibilities offered by the TSA data. Modelling with TSA statistics makes it possible to estimate indirect effects of tourism, calculate scenario's of the effect certain changes has and calculate possible opportunity costs. Linking the TSA with environmental accounts gives an even better idea about opportunity costs because of the inclusion of environmental externalities. However, this refers to future work, and will not be part of this study.

My central question in this study is:

How should an accounting system be structured that can provide answers on tourism policy at the national and sub-national level?

In addressing this question, one important precondition should, at this moment, be put forward. We have seen that the System of National Accounts nowadays functions as the generally accepted framework for compiling macroeconomic statistics. I would like to maintain this basis, or platform, as replacing it would bring too many uncertainties. The answers this system should provide, need to be tuned to tourism policy purposes. The restriction I have put in the central question has the task to limit the type of questions I will address in this study. The question of an entrepreneur who is interested in constructing an additional hotel, for example, will not be addressed in the accounting system meant. The aim of my study is to provide a tool to evaluate tourism policy for a country or for a region such as a province or county.

Finally, a word about my own work in compiling the primary statistics discussed in this study. As part of a series of coordinated efforts to develop and publish tourism-related statistics, a special TSA section of the national accounts Department at Statistics Netherlands, of which I was part, compiled a set of TSA tables for the Netherlands (Hoekstra et al., 2006). The tables on tourism investment and tourism collective consumption (tables 8 and 9) were mainly researched and constructed by myself. Also, at the time of my employment at the Central Bureau of Statistics in Aruba, I constructed the TSA and the IO table for Aruba. The tables on tourism in the Netherlands can be found in chapters 4, 5 and 6, and the tables for Aruba in chapters 4 and 7; the IO table is part of chapter 8. Most of these tables have also been published in relevant publications of Statistics Netherlands, the Central Bureau of Statistics of Aruba, and others. These publications can also be found in the references of this study.

1.2   *Themes to be discussed*

This research is concerned with those extensions of the national accounts dealing with tourism, the so-called Tourism Satellite Account (TSA). The problem is that tourism is implicitly included in macroeconomic statistics produced by the national

accounts. To make tourism explicit, tourism shares have to be assembled and placed in a TSA structure. The compilation of the TSA, concepts, definitions and guidelines has recently been established in a coordinated, international effort. These concepts, definitions and accounting rules have been recorded in a handbook on the Tourism Satellite Account compilation (TSA: RMF, United Nations Statistical Department et al., 2000). The TSA framework is connected to the System of National Accounts, enabling comparisons of statistics on macroeconomic level. The TSA approaches tourism mainly from the consumption, production and employment side. These aspects of tourism are very important but do not provide a complete picture. My research will give a general appraisal of the development of the TSA and will propose improvements. Links with empirical economic modelling work will be explored especially in chapter 8.

In the emerging field of tourism economics, there is much room for debate and alternative interpretations. The most important and probably the most difficult question to address is:

1. *What is tourism?*

Without a good definition of tourism, it cannot be measured or described in a structured fashion. The different stakeholders in a country or region, such as policy makers and 'the industry', need statistics, in a broad sense, for the development of policies and strategies. On a national and international level there is much debate on what exactly constitutes tourism and what not. Industries and activities such as agriculture, retail and banking, are classified according to the goods or services they produce. For instance, if a person prints t-shirts and sells these t-shirts in his/her shop and most of the money is made by the retail activity, this person is a retailer and belongs in the industry retail. Tourism is different, it does not matter which industry or activity produces the goods and services but who consumes the goods and services. In case the consumer meets certain criteria of being a visitor, the goods and services consumend belong to tourism: tourism is approached from the consumer side instead of the production side. This interpretation of tourism is fundamental for its measurement. Because tourism is defined depending on local circumstances, the use of the statistics and sometimes availability of data, the characteristics of tourism need to be clear to be able to compare and value statistics on tourism. The definition needs to be a workable definition for local policy makers and decision takers and furthermore needs to meet certain international criteria for the resulting statistics to be compared with the statistics of other countries.

2. *How does the Tourism Satellite Account (TSA) actually deal with tourism?*

The TSA framework consists of a set of *ten* tables. The first set of tables concern the amount of goods and services consumed by visitors and produced by industries or

imported. Specific aspects of tourism such as employment in tourism, investment in tourism and the consumption of special government services are presented in separate tables. The previous aspects of tourism are all presented in monetary terms. There are also some non-monetary indicators which are of interest to policy makers and decision makers such as the number of overnight stays and the number of companies involved in tourism.

The impact of tourism on a country or region varies widely. In some countries tourism is the main activity and foreign exchange is primarily earned through inbound tourism. These countries are, therefore, relatively vulnerable to external shocks. For a country such as Aruba, a small island in the Caribbean, tourism is relatively important. Aruba has about 600,000 international tourism arrivals annually [21]. According to the Central Bureau of Statistics of Aruba, inbound tourism constitutes about 18 percent of gross domestic product (GDP) in 1999 (Van de Steeg, 2005a). With tourism playing such an important role in the Aruba economy, Aruba is realizing the necessity for a better understanding of tourism. The last decade of rapid tourism development has not only contributed to the Aruba foreign exchange reserve, but has also brought large expansion in the tourism industry with all its consequences [22]. However, I will show that the TSA framework, as it stands, does not supply sufficient information for countries such as Aruba.

3. *Do the TSA deal with tourism in an adequate fashion?*

Above I have already expressed certain reservations about the present framework. But there is more to say. At present the structure of the tourism accounts is a rather loose one. The TSA consists of a set of tables addressing consumption, production, employment, government final consumption expenditure, gross fixed capital formation related to tourism and non-monetary tourism information. The tables on consumption and production are integrated which resulted in the measurement of tourism in the total production volume and production minus production related costs, which is value added. Employment, however, is included in the calculations only for wages and salaries. Statistics in the other tables do not have a direct relationship with each other. For instance, statistics on the number of hours worked, employment status, tourism gross fixed capital formation, government final consumption are *not* integrated with other TSA statistics. Thus I will show that the set of TSA: RMF recommended tables does not offer a complete picture of tourism in an economy. Only a limited number of transactions, such as production, consumption and investment, are presented in the TSA set of tables. Certain other relevant transactions, such as dividend and interest payments, clearly are also relevant for estimating the effects of tourism on the economy. The complete flow of tourism-related expenditures and production should be traced through the whole economy. Also, the current TSA framework does not show interactions of tourism with the rest of the economy, such as households and general government, or with

the rest of the world. The *benefits* of tourism for, e.g. general government in revenues (such as tax revenue or levies), can therefore not be observed. These transactions and interactions with other parties in the economy together can give policy makers and decision takers insight in, e.g., the sustainability of tourism. The current TSA is, therefore, in those areas, inadequate.

4. How can the TSA be improved or extended?

The TSA framework has been constructed in such a way that extensions can be incorporated without undue effort. The connection the TSA has with SNA offers possibilities of relating TSA outcomes to the main SNA indicators such as overall production, consumption and investment and also to the institutional sector accounts. In the institutional sector accounts tourism expenditures can be analysed in a set of specifically ordered accounts [23] from transaction to transaction. The benefits of the institutional approach include enhanced insight in the further distribution and use of the income earned with tourism.

The extension of the TSA can also take place in the use of the TSA results for modelling exercises. A TSA of a country or region gives a good idea of the magnitude of tourism in the economy. However, based on TSA's, the impact of policy measures can only be viewed afterwards. For a good insight in the impact of tourism, economic modelling is required. The Tourism Satellite Account, naturally, can be used as a basis for modelling. The models developed can be used to estimate the future implications of policy decisions or for developing scenarios. A number of models or modelling techniques are potentially available. In this study I shall focus on techniques and methodologies that provide a comprehensive view of the economy. This, naturally, immediately delimits a set of models that I will not discuss here. For example, certain types of cost-benefit analysis will not be employed. The reason is that this type of analysis only offers a partial view, which is too limited a goal for my purposes. In addition, a number of special assumptions usually must be made when actually applying the methodology. Because tourism is an industry that influences many parts of an economy, I shall opt for a methodology (or possibly a set of methodologies) that allow me to focus on the many interactions and interconnections that are involved when analyzing tourism's impact. In addition, the methodology to be chosen should be flexible enough to allow a detailed view of specific activities or sub-activities.

5. What is the link between the TSA and economic modelling?

The TSA has a link with all economic models in the sense that it supplies information for these models. Among these models are computable general equilibrium (CGE) models, econometric models and input-output models. However, with a focus on detail I opt for an input-output type of modelling. This type of model is linked to

the national accounts, has a high level of detail, and offers the possibility of calculating the direct *and indirect* effects of any change in (exogenous) variables.

The level of detail in the input-output table available for modelling, i.e. the level of aggregation of the data, depends on a number of aspects. The aggregation level of data is determined by the detail in the data used (such as the supply and use tables and basic data), the classifications and level of classification used on the data, the data reliability, data confidentiality and publication requirements. Data confidentiality is relevant because presented statistics are not allowed to disclose individual specifications of a person, enterprise or any other individual unit. The publication of statistical information might very well take place at a relatively high level of aggregation due to readability of the tables and requirements of the users of the statistics. In the next chapters and especially in chapter 8, the important role of the supply and use tables in assembling an input-output table will become apparent.[24] Input-output tables are often based directly or indirectly on supply and use tables and these (i.e. the supply and use tables) therefore determine the level of detail in the input-output tables. Increasing the level of detail in tables includes adding more assumptions in the data compilation process and makes the information presented in the table less reliable.

There are additional reasons for my choice of an input-output modelling effort. A major reason is that IO is firmly grounded in technological relations of production. This gives this type of model what may be called a classical flavour. That is, structural aspects of the economy can be focused on in the degree required, while also normative aspects can be given the necessary attention; we shall come back later to this in chapters 8 and 9. This is unlike most models that are built along CGE-based principles, see Rose (1995)[25].

In fact, my study is in the tradition of what has become known as the subfield of structural economics. It is useful to quote here Duchin (1998, p. 75), verbatim:

"Structural economics aims to describe and explain many of the salient features of technological, social and environmental changes and their interactions within an economic system. The latter includes all activities related to the transformation of energy, materials, and other parts of the natural system, like soils and water, to serve human purposes. The emphasis on structure implies an interest in the state of the economic system during a particular interval of time, rather than only or mainly in rates of change. The state of an economy is described systematically and with a substantial amount of detail".

There is another point regarding IO modelling that is useful to discuss at this place. IO often is viewed as a model characterized by so-called fixed input coefficients (precise definitions will come in chapter 8; meant is that underlying notions of

inputs in production presuppose an unrealistic rigidity in input proportions). If this is interpreted in the sense that IO models are not able to capture reactions of producers and/or consumers to changed conditions, such a view is incorrect. To quote Duchin (1998, p. 80–81) again, verbatim:

"In recent years only the simplest input-output studies have actually used parameters that do not change; on the contrary, much of the research effort in input-output economics is devoted to the projection of the parameters that correspond to alternative scenarios. The failure of academic economists to take note of the changed practices reveals the deeper objection to "fixed" coefficients. It is not that the coefficients do not change but more specifically, that physical structures do not respond automatically to changes in prices, as they do in a neoclassical conception of rational behaviour. Elasticities of substitution are not built into the conceptual framework of input-output economics. Substitution behaviour on the part of consumers or even producers is not considered to be a straightforward reaction to prices. Instead of ubiquitous substitutions among atomistic constituents on the margin, input-output economists deal with discrete and explicit changes in structures". Below we shall return to these issues.

6. *Given the choice for an input-output type of model, which type should be used for modelling tourism policy?*

In this study I will confine myself to so-called open input-output models. This type of model is the standard "work horse" model all over the world. It consists of a core input-output table and specifications of exogenous final demand and the value added parts. The TSA's basic function is to help construct that part of (exogenous) final demand that registers tourism activities, at the level of detail one wishes to possess. There may be an additional problem present in that a tourism final demand column may have to be converted from a registration in industries to one in products, and vice versa. This, evidently, depends on the type of analysis one wishes to make.

Furthermore, for the input-output approach an input-output table is required, but here one can usually resort to (small variations on) the standard approach. Many countries produce these tables on their own or as a derivative of supply and use tables. A symmetric input-output table shows the inputs and outputs of a production process in one table. The table can consist of industries by industries, activities by activities or products by products and are often compiled using the above mentioned supply and use tables. Input-output tables can also be constructed using basic data sources on the inputs which are required for a certain output (production). For this study input-output models for Aruba are used. The Aruba input-output table has been compiled using basic data. For Aruba it would be interesting to establish which kind of "trickle down" effect tourism has in the economy.

7. *"Where are we now?"*

The final question 'where are we now?' needs specific attention. This study starts with the main framework of the TSA. The set of TSA: RMF recommended tables are discussed and illustrated using two countries. I have selected specific issues and aspects of the current TSA framework to explore further. For two tables of the TSA framework I have included extensive research on the methodology which should be used for the compilation of these tables.

Furthermore, in this study I try to give policy makers, decision takers and other interested parties a helping hand by placing the TSA statistics in a broader context. TSA information is incorporated in the framework of the institutional sector accounts and input-output tables and modelling. Some other dimensions of the analyses of tourism are outside the scope of this study but are increasingly part of international research. The analysis of the regional aspects of tourism and linking the TSA with other satellite accounts are examples.

Just as there are regional versions of the supply and use tables, the TSA is also being compiled for specific regions. For instance, for some countries, such as the United Kingdom, Denmark and Canada, research into regional TSA has been conducted (Barber-Dueck and Kotsovos, 2003; Jones, 2004; Zhang, 2005). In these TSA tourism statistics are presented by region such as the composition of the industries producing goods and services which are consumed by visitors. The regionalisation of the TSA gives policy makers the opportunity to analyse the different impacts tourism has on the various regions of a country and adjust their plans to fit the needs of each region. The methodology for the regional TSA benefits from this empirical work.

Tourism development cannot be seen separate from the environment which includes the tourism attractions, such as the coastline and forest, and use of natural resources such as water and land. The TSA is part of the SNA, which facilitates the connection between tourism statistics and environmental statistics. The NAMEA is an environmental satellite account for which it would be interesting to study the link with the TSA. Questions about the sustainability of tourism or on the development of sustainable tourism might be answered using this link. Empirical work is taking place in this direction (see Ortúzar and Ortúzar, 2006; Gallego Galan, and Moniche Bermejo, 2006; Diaz, 2006 and Barber-Dueck and Kemp, 2006).

In this study, input-output modelling is used to investigate the indirect effects of tourism. In the same vein, future research can explore combining TSA information with other models or approaches, such as computable general equilibrium or econometric models.

1.3   Outline of the thesis

Below I present the themes as laid down in this study's chapters. The System of National Accounts and its satellites are discussed in chapter 2. The SNA is the basis for the development of tourism statistics which are related to other economic statistics and internationally comparable. Satellites have been developed to focus on a specific subject without losing the connection with economic indicators such as GDP and total production. One of the satellite accounts of the SNA is the Tourism Satellite Account – the subject of my study.

In chapter 3, the concepts, definitions and methodology of the Tourism Satellite Account are explained and discussed. The TSA consists of a set of *ten* TSA: RMF recommended tables. The tables describe the production of goods and services which are consumed by visitors, employment in tourism, investment in tourism, consumption of visitors of collective government consumption and some non-monetary indicators. Certain methodological issues concerning the definition and measurement of tourism are treated specifically.

The TSA methodology of the first six tables is applied to two very different countries in chapter 4. The Tourism Satellite Account for the Netherlands and Aruba are illustrations of different methodological issues concerning the compilation of the tables on tourism consumption and production. Tourism statistics are constructed for various types of tourism such as domestic, inbound and internal tourism.

The measurement of tourism investment and tourism collective consumption is not part of the core of the TSA framework. The TSA tables on consumption and production are produced more often then these tables. Some methodological issues on the construction of these tables are discussed in chapters 5 and 6. The case of the Netherlands serves as an example for both tables.

In the previous chapters the current TSA framework has been discussed and applied on real countries. The TSA provides valuable statistics which can be used in policy making, decision taking, et cetera. However, more insight in the effect tourism has on an economy improves planning and policy. Therefore, it is important to put tourism in a *wider context*. In chapter 7, tourism is explored from the view of the institutional sector accounts. I propose 1) to transform the tourism activity into an economic sector, and 2) to relate this sector to other economic sectors such as households, government and non-financial corporations. This has many advantages. For example, this institutional approach allows estimating the effects of tourism on the balance of payment of a country.

The developed TSA structure is also placed in a broader context by "putting it to work" in a modelling exercise. An input-output table with a tourism column is

built and later on used in input-output modelling. The input-output table and multipliers are part of chapter 8. Some modelling results are presented for the island of Aruba. Conclusions and outlook wind this study up in chapter 9.

Appendix 1.1

In this study I use a number of terms for which different explanations or interpretations may circulate in the literature. Here I will follow the definitions and explanations as put forward in SNA93. Because my argument rests among other things on an unambiguous understanding of these terms, I will discuss them here briefly.

An *enterprise* may be a corporation, a non profit institution, or an unincorporated enterprise (SNA93, par. 5.1) (see: SNA93, par. 5.17–5.5.20 for further reading on enterprises). Corporate enterprises and non-profit institutions are complete *institutional units*. An unincorporated enterprise refers to an institutional unit (household or government unit) only in its capacity as a producer of goods and services. A single (large) enterprise may engage simultaneously in many different kinds of productive activities. There is no upper limit to the size and activities of an enterprise. In the case enterprises are grouped together on the basis of their main activities some of the resulting groups are likely to be very heterogeneous with respect of the production process and goods and services produced. For analysis of production in which the technology of production plays an important role it is necessary to work with groups of producers who are engaged in essentially the same kind of production. This requirement means that some institutional units must be partitioned into smaller and more homogeneous units. These units are defined as *establishments* in the SNA (SNA93, par. 5.2). An establishment is defined in SNA93 as an enterprise or part of an enterprise that is situated in a single location and in which only a single (non-ancillary) productive activity is carried out or in which the principal productive activity accounts for most of the value added (SNA93, par. 5.21) (see: SNA93, par. 5.21–5.39 for further reading on establishments). *Industries* are defined as groups of establishments engaged in the same, or similar, kinds of activity (SNA93, par. 5.40) (see: SNA93, par. 5.40–5.44 for further reading on industries).

For the classification or grouping of establishments into industries, the International Standard Industrial Classification of All Economic Activities (ISIC, rev. 3) is recommended by the United Nations. The ISIC contains four levels, i.e. Class, Group, Division and Section. This classification uses kinds of activity for distributing establishments in the various categories. In the SNA production consists of processes or *activities* carried out under the control and responsibility of institutional units that use labour, capital and goods and services as inputs to produce goods and services as output (SNA93, par. 5.4). The principal activity of a producer unit is the activity whose value added exceeds that of any other activity carried out

within the same unit. The producer unit is an enterprise or establishment. This activity determines the classification in ISIC (SNA93, par. 5.7) (see SNA93, par. 5.3–5.16 for further reading on various activities, i.e. the difference between principal and secondary activities and ancillary activities).

Production is described in general terms as an activity in which an enterprise uses inputs to produce outputs (SNA93, par. 6.6). There are two main kinds of outputs, namely goods and services (see SNA93, par. 6.14–6.36 which part of production is considered, i.e. the production boundary). Goods and services are called *products* (products and products are used synonymous). The Central Product Classification (CPC) of the United Nations is based on the physical characteristics of goods or on the nature of the services rendered (SNA93, par. 5.44). The CPC contains more than 1,800 products at its 5-digit level (SNA93, par. 15.23).

Institutional units are grouped to make up sectors and sub-sectors. Economic entities, which are capable of owning assets, incurring liabilities and engaging in economic activities and transactions with other entities, are described as *institutional units* (SNA93, par. 4.1). Resident institutional units that make up the total economy are grouped into five mutually exclusive institutional sectors. These sectors are: the non-financial corporations sector, the financial sector, the government sector, the non-profit institutions serving households sector (such as churches) and the households sector (SNA93, par. 4.6).

Notes

[1]   In the history of the World Tourism Organization some name changes have taken place. In 1975 the International Union of Official Travel Organizations (IUOTO) became the World Tourism Organization (World Tourism Organization, 1978). In 2003 the World Tourism Organization became a fully-fledged specialized agency of the United Nations. The General Assembly of the United Nations adopted unanimously, on 23 December 2003, resolution A/RES/58/232 making the World Tourism Organization, the United Nations World Tourism Organization (UNWTO). The references from before 2003 will use the World Tourism Organization (WTO) as author and the references from 2004 will have the United Nations World Tourism Organization (UNWTO) as author.

[2]   The figures for the last two years are based on estimates of June 2007.

[3]   Definitions of concepts used, including those dealing with tourism in a narrow sense, will be given further below.

[4]   Note that the terms "job" and "person" are not identical.

[5]   The "technical" definition of industry can be found in the appendix of this chapter.

[6]   See www.kingdomofbhutan.com/visitor/visitor.html, 2008.

[7]   See www.kingdomofbhutan.com/visitor/visitor.html, 2008 ; De Volkskrant, 2004a and b; National Environment Commission, 2002 ; National Environmental Commission, 2004.

⁸⁾ For the development of rural areas in Bhutan the advantage of tourism is also acknowledged (National Environmental Commission, 2002).

⁹⁾ Here the concept of 'natural capital' is relevant. Natural capital is the sum of nonrenewable resources (including oil, natural gas, coal and mineral resources), cropland, pastureland, forest areas (including areas used for timber extraction and non-timber forest products), and protected areas (The World Bank, 2006, p. 23). Natural capital and its changes is a useful indicator to guide policy. Saving efforts aimed at offsetting the depletion of natural resources can lead to future welfare increases, especially in developing countries. Developing countries are most vulnerable for the depletion of their natural capital as these resources are often used for earning foreign exchange and short term economic growth. Tourism is often dependent on natural capital such as white beaches, heritage sites and natural scenery. There needs to be a sustained and balanced tourism development which requires a set of institutions that are capable of managing the natural resource, collecting resource rents and directing these rents into profitable investments. Resource policy, fiscal policy and political economy all have a role to play in this.

¹⁰⁾ Abeelen (1996) has undertaken a study on the sustainability of tourism in the Caribbean island of Curaçao. His paper examines to what extent tourism can be organized in a way that the environment of Curaçao is not being damaged. The foremost conclusion is that with the use of ample information important choices and hard decisions have to be made concerning the direction of tourism development. Abeelen has a background in environmental policy and organization. His study examines tourism in relation with various environmental issues such as energy and water usage, spatial planning and erosion. The study does not make use of economic statistical frameworks whereas my study does.

¹¹⁾ Tourism demand refers more or less to the expenditures of visitors. Visitors demand goods and services for their consumption.

¹²⁾ About 591 thousand cruise ship passengers called in at the port of Aruba in 2006 (CBS of Aruba, 2007). The reason for Croes to exclude cruise tourism in his study might be due to the focus in his research. In his study, Croes tries to construct a model for estimating the international tourism demand for Aruba. Factors, such as income of the visitor and familiarity with Aruba, can play a role with visitors choosing to go to Aruba. However, the program of cruises is set and cannot be influenced by the individual traveler. Therefore, the demand for Aruba of these kinds of tourists cannot easily be explained by pre-determined factors.

¹³⁾ In the appendix of this chapter further explanations of these classifications can be found.

¹⁴⁾ See e.g. Cole (1993) and Cole et al. (1993) on the cultural division of labour in socially and economically segmented societies. Unexpected developments can be observed. For example, special importance must be given to cultural or psychological phenomena. See e.g. Guadeloupe (2005) on the role of local radio DJ's as a transfer point in the Caribbean island of Saint Martin/Sint Maarten.

[15] One of the arguments involved concerned the perceived threat of the spreading of communism in Europe (Palmer et al., 2002).

[16] See the appendix of this chapter.

[17] See footnote 1 on this.

[18] See footnote 1 on this.

[19] The term comprehensive refers here to the inclusion of more transactions and other parties in the economy.

[20] At the end of this chapter in the appendix the term institutional unit will be explained.

[21] In the so-called Tourism Penetration Index (TPI), which measures the socio-economic and environmental impacts of tourism, Aruba ranks 5th of 47 islands (McElroy, 2000).

[22] One of the consequences of the significant increase of tourism is the growing demand for labour. Policy makers in Aruba experience a tight labour market. Even though, unemployment is estimated at around 7 percent, it is found that immigrants are needed to fill up job vacancies. These job vacancies are located in the high qualified positions and elementary positions, unskilled and low-skilled level (Koning, 1998; 2006; CBS of Aruba, 2003a).

[23] I refer here to the sequence of accounts. I will discuss this sequence of accounts in section 2.4.

[24] Supply and use tables are square or rectangular tables, which show, among other things, the use of intermediate goods and services for each industry for the production (making) of goods and services. With the use of algorithms these supply and use tables are transformed into an input-output table (Steenge, 1989, 1990a; Steenge and Konijn, 1993; Konijn, 1994; Konijn and Steenge, 1995). I come back to these tables in more detail in Chapter 8.

[25] For recent studies along CGE lines, see Adams and Parmenter (1995), Dwyer et al. (2004), Blake et al. (2006), or Burnett et al. (2007).

2. The System of National Accounts and its satellites

2.1 Introduction

The national accounts are a set of statistics characterized by a particular structure, assembled to increase our insight in the economic system and to assist in policy design. The national accounts (NA) are designed for economic analysis, policy making and decision taking. They should be comparable in time and among countries. They have seen a considerable transformation over the years from a small set of statistics to a complete system of accounts, balance sheets and tables. After a long and elaborate history, the 'System of National Accounts 1993' (SNA93, UN et al., 1993) provided what until now appears to be a rather robust structure, and provides the main framework for economic statistics.

The central framework of the SNA consists of the *supply and use tables* (SUT) on the one hand, and the *institutional sector accounts* on the other hand. There can be other tables which are sometimes included in the main framework of SNA such as cross classification industry by sector (CCIS) tables and (as in the Netherlands) labour accounts, but the combination of supply and use tables and institutional sector accounts will be referred to in this study as the central or core SNA framework.

> *The central framework of SNA93 consists of:*
> – *Supply (make) and use tables;*
> – *Institutional sector accounts.*

This core gives a description of economic activities in terms of industries on the one hand, and goods and services on the other. The supply table gives the origin of a country's resources in terms of goods and services. The use table gives the use of these resources, and the cost structure of the industries. In this way, the SUT provides an internally consistent, coordinating framework for economic statistics on product flows, thereby offering an integrating framework for the multitude of sources of statistics in a modern economy.

Beside economic activities the core also describes the economy using institutional sectors. The five institutional sectors are:
– non-financial corporations,
– financial corporations,
– general government,
– households,
– non-profit institutions serving households.

The transactions undertaken by the institutional sectors are shown in the various accounts.

The use table gives the goods and services which are used in the production process as intermediate consumption in terms of product and industry categories; the supply table gives the goods and services, which are produced (supplied) by each industry. The use table shows the goods and services which are processed in the production process into intermediate or final products per industry category. Import and export data complete the tables.

> *The supply (make) and use tables:*
> *Matrices that record how supplies of different kinds of goods and services originate from domestic industries and imports and how these supplies are allocated between various in-termediate or final uses, including exports. The total supplies and uses of individual types of goods and services have to be balanced with each other (SNA93, par. 1.16).*

The value added of an economy is one of the most important statistics of a country; the combined valued added in the economy results in gross domestic product (GDP) or gross national income (GNI), depending on what is included. The institutional sector accounts record the further distribution of the generated income from production (profits), labour costs (wages and salaries) into consumption, savings, investment and financial transactions in balance sheets. These consist of five broad categories, and an additional link to the rest of the world.

> *The institutional sector accounts give, for each economic sector, i.e.*
> *– non-financial corporations,*
> *– financial corporations,*
> *– general government,*
> *– households,*
> *– non-profit institutions serving households,*
> *and the rest of the world the accounts that show the*
> *– production,*
> *– generation of income,*
> *– distribution of income,*
> *– redistribution of income,*
> *– use of incomes for purposes of consumption or saving,*
> *– accumulation of assets and liabilities, and*
> *– balance sheets (SNA93, par. 1.5–1.11).*

The core system gives structure to the mass of statistics in a country. However, the

system also has its own internal logic. This logic can sometimes be experienced as rather rigid in the sense that particular statistics cannot be incorporated in a straightforward manner. To accommodate these types of statistics, the core accounting system has been extended with so-called *satellite accounts* and *modules*. These satellites have their own particular connections to the core. (The distribution between 'core' and 'modules' is an important aspect of the so-called Dutch school of national accounting; see especially Reich (1993) on the characteristics of the Dutch school).

Figure 2.1 The relationship between the central framework of SNA and modules
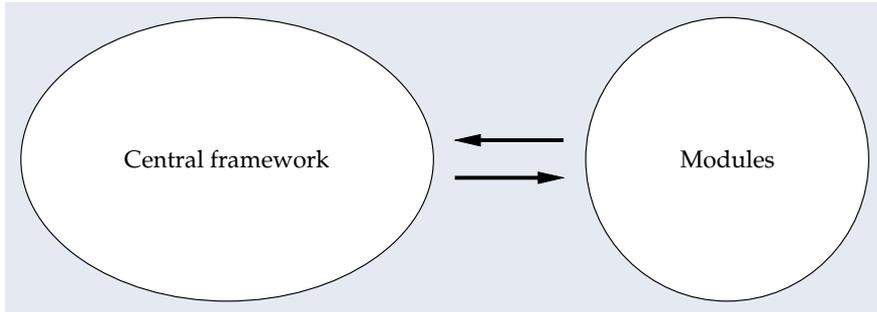
Examples are found in the area of the environment such as the environmental accounts which include the national accounts Matrix including Environmental Accounts (the NAMEA). Other examples are found in the area of social statistics (the Social Accounting Matrix, SAM) and tourism statistics (the Tourism Satellite Account, TSA).

Figure 2.2 The relationship between the central framework of SNA and some of the satellite accounts
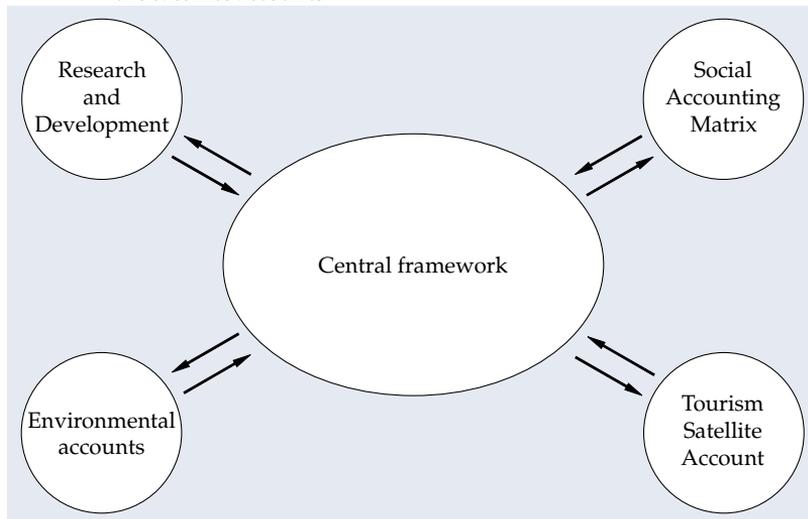
2.2 Short Introduction to the System of National Accounts

The publication of the 'System of National Accounts 1993' (SNA93), now some 16 years ago, was not the end of the development of the NA. Internationally there has been considerable convergence in the use of the structure, scope of accounts and measurement methods suggested in these standards. The basic task of the SNA is to provide a comprehensive accounting framework for the compilation of macro-economic statistics such as GDP, economic growth, total consumption and total investment, i.e. the major indicators of the economic performance of a country. The SNA also includes statistics on a more detailed level such as the industry and product level. The SNA data is suitable for the analysis and evaluation of the economic performance of industries, but also of sectors such as households and corporations.

Certain macroeconomic aggregates, such as gross domestic product (GDP), national income and GDP per head of the population, are calculated *within* the accounts of the SNA. These *key indicators* have acquired an identity of their own and are widely used by analysts, politicians, the business community, the press and the public at large. There are several reasons for this. Firstly, they are used to evaluate the overall performance of an economy. Secondly, they are used to judge the relative success or failure of economic policies. national accounts data is widely used for international comparisons of the volumes of major aggregates such as production, savings and taxes. Eligibility for international loans, aid or other funds and the terms or conditions under which these moneys are made available, are also determined using national accounts data. Certain levels of GDP or per capita GDP determine the qualification of a country as, for instance, a developing country - which opens the road for lower levels or exemption for export tariffs to trading partners such as the United States of America and the European Union. The contributions countries pay to international organisations, such as the United Nations (UN), the European Union (EU) and the International Monetary Fund (IMF), are calculated using national accounts aggregates, such as GDP. The contributions cover the expenses of international organizations. The basic concepts, classifications, accounting rules and definitions of the system are to be found in economic theory and in principles which have universal application and recognition, and that are invariant to the particular economic circumstances in which they are applied. SNA covers a wide range of circumstances to facilitate an extensive range of economies and countries, small and large, developed and developing, open and closed, et cetera.

Internal consistency of the SNA

The terms 'integrated' and 'consistent' have already been used several times. At this moment it may be helpful to briefly address these terms in more detail. The SNA consists of an *integrated* and *consistent* set of macroeconomic accounts, balance

sheets and tables. Here the term *integrated* means that the same concepts, definitions and classifications are applied to all accounts and sub-accounts (SNA93, par. 2.3). The concept of production includes certain boundaries which determine what belongs to production, such as commercially operating a dry cleaner, and what is excluded from production, such as washing one's own clothes. This concept of production has the same meaning and implications in the supply and use tables and in the accounts of the institutional sector accounts. Satellite accounts (to be discussed in detail below) also use the same concept of production unless in the satellite account specific mention is made of a deviation in this area. The framework is *consistent* because each economic flow or stock is measured identically regarding the parties involved. This consistency is achieved by applying, throughout the system, the same concepts and definitions, and, additionally, by using a single set of accounting rules for all entries in the system (SNA93, par. 2.5). A specific entry in an account is balanced with another entry in an account. For instance, the purchase of certain materials for the production of bread is intermediate consumption for the bakery and, for the same amount, output for the mill producing the flower. The financial part of this transaction is also balanced as the bank account of the bakery decreases with the same amount as the purchase and the bank account of the mill increases with the same amount as the sale.

After a long history, the national accounts have evolved into a comprehensive framework which describes the essential phenomena which constitute economic life: production, income, consumption, accumulation and wealth. However there are limits as to what the system can accommodate. In response to the ever increasing scale and scope of the data requirements, a new structure was introduced. This new structure consisted of two parts, a central or core framework and a set of associated accounts, the so-called satellites or satellite accounts. The introduction of the satellite accounts greatly facilitates the analysis of specific areas of research which use alternative concepts but should stay linked to the main framework. In principle all basic concepts and classifications of (what now became) the core framework are retained. Only when the specific purpose of the satellite account requires modification, are changes in the basic concepts introduced.

Data sources

SNA describes production, income, consumption, accumulation and wealth. It gives a transparent and simplified but complete representation of this set of phenomena and their interrelations (SNA93, par. 2.2). Within the system, data from different sources, such as household and production surveys, tax information and government income and expenditure information, are combined to achieve a consistent set of accounts, balance sheets and tables. Combining data sources offers compilers of the national accounts the opportunity to fit different quantities and qualities of data in the system, and to reach the best attainable outcome. Household surveys include information on the consumption patterns of households such as

the type, volume and prices of purchased products. This information is confronted with detailed information on imports and domestic production. Certain goods, such as tobacco and alcohol, are underestimated in household surveys and are therefore estimated using production and imports estimates. The fact that within the national accounts GDP is calculated using three different equations [1], each with its own sources of information, is an excellent example of the combination and confrontation of data. This method is very data intensive - which can be considered a weakness of the national accounts. Certain countries with limited resources do not compile complete sets of accounts but estimate GDP or national income using only one of the macroeconomic equations and model part of the data. This has as an advantage that the work is less data intensive and therefore cheaper, but the results are less reliable and detailed. The distribution of the contributions of the various industries in GDP cannot be estimated in this way.

The concepts and classifications of the national accounts have been standardised on an international level and are laid down in international guidelines (SNA 1993 and ESA 1995). This is of vital importance for international comparability. Nowadays, national accounts data are used by a large number of institutions such as Eurostat (the statistical bureau of the European Union), OECD (Organisation for Economic Cooperation and Development), UN (United Nations), IMF (International Monetary Fund), ECB (the European Central Bank) and ILO (International Labour Organization). Also many individual countries are committed to the international rules. For example, the Netherlands are committed to supply to several international institutions clearly defined data sets at specific points of time. The Dutch national accounts, for example, follow the international classification of ESA 1995. In a limited number of cases the classification has been adapted to the Dutch situation. The Dutch national accounts data are published on paper and on the CBS-website (StatLine) (http://www.cbs.nl).

2.3 Historic background of SNA

A brief overview of the historic background is useful here [2]. The SNA is an economic accounting structure derived from various types of macroeconomic analysis. Its architecture is drawn from many areas of macroeconomic study with first estimates dating back to Petty and King in England and Boisguillebert and Vauban in France, all in the 17th century. The first exercises aimed at trying to understand differences in economic strength – which often translated into differences in military strength. These exercises were usually intended for concrete policy issues, where we observe the first use of an early type of national income. These estimates were, for example, used to show the existence of a larger tax base, to increase knowledge of a country's wealth, and to make international comparisons between countries possible (in particular England, Holland and France).

At the crossroads of national accounting and economic modelling, François Quesnay published, in France, his famous Tableau économique in 1758, also known as the 'zigzag'. There was a political agenda behind the zigzag. It was developed to show that France was deviating from a 'best' or 'ideal' path because its resources were spoilt on so-called 'unproductive' activities. The zigzag, in fact, calculates successive rounds of revenue and expenditure by farmers, landlords and artisans, with ever decreasing 'surplus' (I shall come back to this shortly). A century later, Karl Marx became fascinated by the Tableau, and tried to use it for presenting his political views. The Tableau has often been considered a predecessor of what evolved much later into input-output tables and sector accounts. The debate linking the Tableau to later concepts by Wassily Leontief in the 1930s (Leontief, 1936; 1937) gained new impetus after Phillips' (1955) transcription of the Tableau into modern input-output parlance [3].

The Twentieth Century saw a renewed interest in national accounting, and related types of statistics and economic theory. A major cause can be found in the two World Wars and the Great Depression of the nineteen thirties. Policy required insight in the interdependencies of the economic system, supported by the necessary statistics and mathematical modelling. Here the work of three famous economists, Keynes, Tinbergen and Leontief provided invaluable insights. It was also realized that forms of international policy coordination would be required to restructure the global economic system. This implied the need for forms of international guidelines for setting up statistical information systems in relation to economic and econometric modelling.

There was an increasing demand for a standardized system. Early efforts, in the late nineteen thirties, were Haberler's (1939) and Tinbergen's (1939) work for the League of Nations. After the Second World War, the Marshall Aid provided the first structures for international coordination and organization. At the same time, new international organizations such as the World Bank (WB) and the International Monetary Fund (IMF) acquired their own responsibilities in the new world order, see further Kenessey (1994).

Major work was done in Britain during World War II. Meade and Stone contributed to the development of the national accounts before, during, and after World War II. In 1941 they compiled national income and expenditure estimates for the United Kingdom (Meade and Stone, 1941). These statistics aimed at assisting the planning of the national economy in times of war as well as peace. In a comprehensive system of accounts all previous developments and considerations were combined and became a focus of work at the international level. The appendix to a report of the Sub-Committee on National Income Statistics by Richard Stone in 1947 is regarded as the first completely worked out and detailed national accounting system (SNA93, pp. xxxvii-xxxviii). I should note here that this report should not

be confused with the appearance of the first official guidelines of the United Nations as the report had not been approved by the Statistical Commission of the United Nations as such (Bos, 2003). The first official guidelines were written under the direction of Stone and on request of the OEEC (the predecessor of the OECD) (SNA93).

After World War II, national accounting theory and practice have been increasingly dominated by the introduction of a system of *official guidelines* on national accounting. In this period three steps in the establishment of these international national accounting guidelines can be distinguished, following Bos (2003, p. 17). The first 'SNA' was published in 1953 by the United Nations, following preceding guidelines of 1951 by the OEEC (1952). The United Nations publication of 1953 presented a set of six standard accounts, aiming at both developed and developing countries (UN, 1953). The 1951 OEEC guidelines served as a basis for the establishment of information on economic conditions and performance that were used to administer post-war aid and encourage economic growth.

Sir Richard Stone played a major role in the further development of national accounting [4]. In 1961, he presented a study on the relation between national accounts and IO tables. He proposed to subdivide the production account into a number of industries, which resulted in an IO table. His 1961 study also paid attention to, on the one hand, the statistical requirements, and, on the other hand, the analytical requirements of multiplier and impact analysis. The problem of secondary production is particularly important in this context. This is the problem that industries can produce several products, next to a major or "primary" one. IO, as is known, is built around the assumption of industries producing a single, homogeneous product.

In 1968 the United Nations published a second, more detailed and revised system under the name of "A System of Accounts" (UN, 1968). Again Stone played a major role in its conceptualization. This became a well-known standard work on the compilation of national accounts, generally known as SNA68. Following SNA68, the European Commission published its own guidelines for national accounts in 1970. These guidelines were essentially the same as SNA68, but were more detailed and directed towards European countries.

SNA68 attributed a central place to input-output tables. The input-output table proved to be an extremely convenient vehicle for the collection and integration of data from different sources into one consistent framework. It is a record of all transactions in a country in terms of origins and destinations. To address mounting problems of a statistical nature, SNA68 proposed replacing the IO by another construction, the supply and use tables (SUT for short; also known as the make use framework). Again Stone was a major contributor to this new framework (Konijn,

1994). The terminology again is in terms of "origins" and "destinations". Origins are producing (and selling) industries; destinations are other industries, households, government spending categories and foreign countries. However, one particular task addressed in SNA68 was improving the properties of the input-output tables and the requirements of the SNA. This proved to be a conceptually demanding task. A recurring point here comprises the requirements of direct statistical observation on the one hand, and the theoretical considerations underpinning a specific branch of economics (i.e. input-output analysis), and its core attribute, the input-output table, on the other.

In reality, a certain tension is apparent between the two goals. National accountants started to use the input-output table to make better estimates of national income and other macroeconomic statistics. In many countries the input-output table became an integral part of the national accounts. Nonetheless, during this development the statistical and analytical requirements imposed on the table began to diverge. Clearly, a framework that is convenient for *analysis* does not necessarily have to be the most practical choice for *description* of the economy. The supply and use tables (described more extensively in paragraph 2.4, chapters 4 and 8) better fulfil the statistical needs.

The third revision is the "System of National Accounts 1993" (SNA93, UN et al., 1993). SNA93 contains an elaborate accounting framework with more flexibility to take account of data requirements and national circumstances. This really universal set of accounting standards was jointly published by the Commission of the European Community, the International Monetary Fund, the Organisation for Economic Cooperation and Development, the World Bank and the United Nations. The European Commission issued its national accounting guidelines in the 'European System of Accounts 1995' (ESA95, Eurostat, 1996). ESA95 is based on SNA93 but is more precise and specific, due to its legal status. Within the European Community the national accounts play an important role in determining the contribution of member states and establishing criteria for membership of the monetary union.

An important innovation in SNA93 compared to its predecessors is the attention SNA93 pays to *satellite accounts* (SNA93, chapter XXI), there is already referred to that development. In a separate chapter the satellite accounts are presented in terms of a building block system that expands the scope of the national accounts without overburdening the system with more details, different (possibly conflicting) concepts and further accounting rules. In SNA93 supply and use and input-output tables are presented in a more operational fashion compared to its predecessor. Also, specifically mentioned in SNA93 (par. 15.7) 'the supply-use tables should serve as the foundation from which the analytical input-output tables are constructed'.

The System of National Accounts is designed for economic analysis, decision taking and policy making. It is a multipurpose system designed to serve different kinds of users such as government, labour unions, the press and the general public. There is an explicit statement that the System of National Accounts should *not* be seen as a provider of a welfare indicator (SNA93, Chapter I and J). The System of National Accounts should also not be considered "finished". New rounds of meetings and negotiations for the establishment of a new revision of the System of National Accounts take place on a regular basis[5].

2.4 *The sequence of accounts*

In the previous paragraphs the System of National Accounts has been described in terms of an integrated and consistent statistical framework. National accountants use this framework to collect data from different sources and integrate them into well-known statistics such as national income, total production and total consumption. The actual framework consists of a *succession* of accounts, each presenting successive transactions between economic actors such as institutional sectors and industries. Most of the accounts result in macroeconomic indicators such as consumption, savings, disposable income and national income.

A brief summary of the main *sequence of accounts* is taken from SNA93 and presented in this paragraph[6]. As stated, in SNA93 all flows and stocks are recorded in accounts. In an account uses and resources, changes in assets and liabilities or the stock of assets and liabilities are recorded for a specific aspect of economic life in a certain period of time. The transactions and other flows are recorded in a (sub-) account for units or groups of units such as institutional sectors, industries, establishments, or the rest of the world. The total amounts recorded as receivable and payable in an account usually differ, and *do not balance*.

A *balancing item* is introduced between the total assets or resources and the total liabilities or uses of a unit or group of units. Balancing items are meaningful measures of economic performance and constitute macroeconomic aggregates when summed for the whole economy. The accounts are presented in a specific sequence or order with the balancing item of the previous account being the first entry, except for the first account[7]. Note, however, that this of course does not mean that the activities which they describe should be interpreted as taking place sequentially in time. Clearly, economic activities involving countless transactions between different institutional units take place simultaneously (SNA93, par. 1.4).

The current accounts, accumulation accounts and balance sheets are three categories of accounts. In figure 2.3 the categories of accounts, the accounts and sub-accounts, and balancing items are presented. The *current accounts* contain the production

Table 2.3
The sequence of accounts categories, accounts, sub-accounts and balancing items (SNA93, Figure 2.3)

Categories of accounts	Accounts	Sub-account	Balancing items [1]
Current accounts	Production account		Value added
	Distribution and use of income accounts	Generation of income account	Operating surplus/ mixed income
		Allocation of primary income account	Balance of primary incomes
		Secondary distribution of income account	Disposable income
		Redistribution of income in kind account	Adjusted disposable oncome
		Use of income account	Saving
Accumulation accounts	Capital account		Net lending/net borrowing
	Financial account		Net lending/net borrowing
	Other changes in assets accounts	Other changes in volume of assets account	Changes in net worth due to other changes in volume of assets
		Revaluation account	Changes in net worth due to holding gains/losses
Balance sheets			Net worth

[1] Most balancing items (and aggregates) can be calculated gross and net.

account, and the distribution and use of income accounts. In the *production account* the production of goods and services is recorded. Gross value added is a measure of the contribution to GDP made by an individual producer, industry or sector. It is calculated as the value of output less the value of intermediate consumption, and constitutes the balancing item of this account. Consumption of fixed capital determines the difference between gross and net and therefore between gross value added and net value added.

The *distribution and use of income accounts* are accounts which address the income generated by production, the distribution of primary income to institutional units, the redistribution of income among institutional units and the use of income by households, general government or non-profit institutions serving households. Gross value added is distributed to labour, capital, and government, and flows to and from the rest of the world in the primary distribution of income account. Compensation of employees, taxes on production and imports less subsidies and the balancing item 'operating surplus' constitute the generation of income account.

The *allocation of primary income account* distributes claims on value added to institutional units. Property income, like interest and dividends, is one of the transactions addressed in this account. In the secondary distribution of income account current taxes on income, wealth, et cetera, social contributions, benefits

and transfers, and other current transfers are paid and received. Final consumption expenditure is part of the use of income account. Income of households, general government and non-profit institutions serving households is used for final consumption or savings.

The *accumulation accounts* consist of the capital, financial, and the other changes in assets account, which are all flow accounts. The capital account records the acquisition and disposal of non-financial assets, which result from transactions with other units or from internal bookkeeping transactions in connection with production. Acquisitions and disposals of financial assets and liabilities through transactions are accounted for in the financial account. The other changes in the volume of assets account and the revaluation account are the two accounts which constitute the other changes in assets account. The first sub-account registers changes in the amounts of the assets and liabilities which are held by institutional units or sectors as a result of factors other then transactions. The destruction of fixed assets caused by a natural disaster is such a factor other then transactions. The second sub-account records those changes in the values of assets and liabilities that result from changes in their prices (SNA93, par. 1.9).

The balancing item of the income accounts, saving, is the link to the accumulation accounts. Saving is disposable income that is not spent on consumption of goods or services and must, therefore, be used to acquire non-financial or financial assets. Saving can also be negative which means that excess consumption is financed by disposing of assets or incurring liabilities (SNA93, par. 1.10). The *balance sheets* in the system show the values of the stocks of assets and liabilities at the beginning and end of an accounting period. Within the sequence of accounts all transactions, price changes or other changes are recorded so that the difference between the values in the opening and closing of the balance sheets are accounted for in the accumulation accounts.

The sequence of accounts is presented in SNA93 in two sets of related tables. In the first set of tables, production, consumption and investment are presented in great detail in an industry dimension. These are the *supply and use tables* (SUT) that we have briefly met before, tables that record how supplies of different kinds of goods and services originate from domestic industries and imports and how those supplies are allocated between various intermediate or final uses, including exports. A set of integrated production and generation of income accounts is compiled for industries and product groups. Industries are groups of establishments different from institutional units, see appendix 1.1. The supply and use tables provide an accounting framework within which the product flow method of compiling national accounts is systematically exploited. The total supplies and uses of individual types of goods and services are balanced with each other (SNA93, par. 1.16).

In the second set of tables, the full sequence of accounts is compiled for the institutional sectors and sub-sectors. In the *institutional sector accounts* the institutional units are essentially units capable of owning goods and assets, incurring liabilities and engaging in economic activities and transactions with other units in their own right. The non-financial corporations, financial corporations, general government, households, and non-profit institutions serving households are the five main institutional sectors which make up the total economy. Transactions between residents and non-residents are located in the rest of the world account. Within the system a complete set of accounts and balance sheets can be compiled for each institutional sector or sub-sector. The number of accounts and institutional sectors, which can be compiled, may be quite large, but depend on the level of disaggregation that is feasible and required (SNA93, par. 1.13). Interactions between different parts of the economy and between the resident economy and the rest of the world can be observed, measured and analysed for policy purposes.

In the national accounting matrix (NAM) the supply and use tables are combined with the institutional sector accounts. The NAM gives an overall view of an economy in matrix format. The central system has characteristics which give it the advantage of an integrated accounting structure. However, a drawback is that the central system has certain limitations as to what can be directly accommodated in the central structure. The central system does have a certain flexibility, but this does not include a facility to accommodate possibly conflicting approaches simultaneously. Therefore, satellite accounts and modules have the task to expand the analytical capacity of national accounting for selected areas of social interest in a flexible manner outside the central framework.

At this point it is useful to introduce the symbolism adopted in discussing IO tables and the supply and use system. I shall first briefly discuss the structure of IO tables after which the mathematical structure of the table is presented.

2.4.1 Input-output tables

The supply and use tables and the institutional sector accounts order the basic data in a specific way. However, for *analytical* purposes along IO lines a symmetric IO *table* is required. This is a consequence of the way IO analysis has been conceptualized from its early beginnings. Operationalization in IO terms usually takes place in terms of transactions between the constituent parties. Following Leontief, these transactions are grouped into categories dealing with the basic elements of an economy, such as production, consumption, investment, employment, and the relations with foreign countries. By assumption, each industry produces a single, homogeneous product. Vice versa, each product is only produced by a single, characterizing industry. The IO table registers the sales of an industry to two kinds of customers, i.e. to the industries that have been distinguished (including the selling industry itself), and to the so-called final demand categories which include

households, investments, government expenses and foreign countries. The first category is known as intermediate demand, the second as final demand because the product has reached its final destination. The purchases of each industry come from itself, from other industries, from abroad, or from the providers of the so-called primary inputs such as labour and capital. Abstracting for the moment from foreign trade results in:

Table 2.4
The input-output table

	Industries	Final demand	Total
Industries	Z	F	g
Primary inputs	Y	–	Yi
Total	g′	i′F	

where:
Z: industry x industry table of intermediate inputs;
F: matrix of final demand categories;
Y: matrix of primary inputs;
g: vector of total industrial outputs;
i: vector of ones;
′: prime, denotes transposition.

An input-output *model* is obtained by introducing a) specific assumptions on the structure of production and/or consumption (in particular regarding the matrices Z and Y above), and b) specific notions on which occurrences are to be considered as exogenous or endogenous, i.e. consisting of responses determined by the structure of the system itself. Standard exercises in IO analysis concern e.g. calculations of the effects of an exogenous change in one or more of the final demand categories (of matrix F above). The structure of the system then determines the effects on the system variables such as production, value added or wages and salaries. With this "trickling down" effect or, more formally, the involved multiplier effects, it is possible to employ our knowledge of the industrial network to determine the effect an external change will cause in the production and related transactions.

In this study input-output modelling will be used to estimate the effects of changes in *tourism* for national economies. However, the tourism industry has a special character which is different from the traditional industries as registered in an IO table. In fact, for further analysis we have to modify the standard input-output model. This is a consequence of the tourism industry being *demand oriented*. This special nature effectively forces the researcher to extend the final expenditure

categories with one more category, a tourism consumption column. This additional column, an adjustment of the classical input-output table, then allows us to calculate the effects of different directions into which an economy can develop. In chapter 8 this will be discussed extensively.

2.4.2 The SUT

Above I already briefly mentioned the supply and use tables, which record how supplies originate from various sources and allocated between the uses. The supply and use framework can best be understood as offering a set of tables developed with a focus on the statistical needs of national accountants. Introducing this specific focus has, however, been at the expense of the analytical ease and modelling usability that IO tables offer. For example, in the concept of the supply table the empirical fact has been explicitly recognized that industries can produce more than one type of product (which eliminates the one on one relationship between industry and product which characterises the symmetric IO table). As we shall see further below, a major challenge is deriving an IO table from the SUT framework. This introduces additional analytical problems, see also chapters 4 and 8.

Before embarking on a fuller discussion in chapters 4 and 8 I present here a well-known schematic representation of the SUT. In SNA68 (pp. 48–51), we find the following representation (table 3.13) and discussion on the newly proposed arrangement. Figure 2.5 is a slight adaptation of this table.
where:

Table 2.5
Representation of the supply and use framework

	U	F	q
V			g
	Y		Yi
q	g	i'F	

U: the use table (product x industry);
F: table of final demand categories (product x final demand categories);
V: the supply table (industry x product);
Y: table of primary inputs (primary input category x industry);
q: column vector of total product outputs;
g: column vector of total industry outputs;
i: column vector of ones;
': prime, denotes transposition.

Therefore, the first row and column relate to products, while the second row and column relate to industries. The first row shows the absorption of products as

intermediate inputs by industries (the elements of U) and by final users (the elements of E). The supply table (V) has industries in the rows and products in the columns. This schedule will be discussed in chapter 4.

2.5   *The development of satellite accounts and modules*

As shown above, the System of National Accounts is a solid, integrated system set with concepts, definitions and accounting rules. Links between the various elements of the system support its structure in a clear and complete way. SNA is designed to be sufficiently comprehensive and flexible to enable a very diverse range of countries using the system. Individual countries, whatever their economic structures, institutional arrangements, or level of development, can select from the system those parts that are considered most relevant and useful for implementation, in light of their own needs and capabilities.

On the other hand, SNA is not always equipped to facilitate the compilation of every kind of statistic. In some cases working with the central framework in a flexible way is not appropriate. For example, even when done in a conceptually consistent way, the central framework could be overburdened with detail. Here *satellite accounts* allow for the introduction of additional (complementary) concepts, classifications and accounting frameworks.

Some requirements of satellite accounts may actually conflict with the central conceptual framework and its architecture. A satellite account for the estimation of the own account production of normal households chores such as cooking dinner, buying groceries and doing one's own washing, would conflict with the production boundary set in the SNA, because, within the central tables the production of meals and clean clothes of households for their own use, is not included in the definition of production. The satellite account in this way measures something with the theoretical underpinning which differs from that of the main framework.

In certain types of analysis, the basic strategy is not to use alternative economic concepts, but simply to focus on a certain field or aspect of economic and social life in the context of national accounts. The intent here is to make apparent, and to describe in more depth, those aspects that do not receive the necessary attention in the accounts of the central framework, or surface only in a limited number of points. Satellite accounts generally have the task to expand the analytical capacity of national accounting. Certain satellite accounts are produced on an experimental basis to develop new statistics. At a later stage, when the development has resulted in well founded statistics, the statistics can be included as part of the central framework. Satellite accounts can differ from the central framework in various respects (SNA93, par. 21.4 and 21.50; Bos, 2003):

- Provision of additional information;
- Use of alternative or complementary concepts and more dimensions;
- The presentation of a partial domain instead of covering all economic life;
- Linkage of physical data to the monetary accounting framework;
- Introduction of relevant indicators and aggregates for further analysis;
- More details on costs and benefits of human activities.

The analysis of a number of important areas of research, such as social protection, health, or the environment, can benefit from building a framework to accommodate elements included in the central framework, explicitly or implicitly, and allow for alternative concepts and presentations. The links with the central framework are always made explicit and any features with a different theoretical base are introduced deliberately.

Some examples of satellite accounts are the Social Accounting Matrix (SAM), the environmental accounts, some experimental accounts and the Tourism Satellite Account (TSA).

In a Social Accounting Matrix (SAM) [8] the flexibility of the system is used to highlight social interests and concerns by paying particular attention to households and labour markets. SNA93 (par. 20.4) defines a SAM as "the presentation of SNA accounts in a matrix which elaborates the linkages between a supply and use table and institutional sector accounts". SAMs are closely related to national accounts, where they focus on the interrelationship between the structural features of an economy and the distribution of income and expenditure among households categories. SAMs provide comprehensive one-period information on variables, such as the structure, composition and the level of production, the distribution of income among households, and value added. The SAM is an approach for data organization, reconciliation and descriptive analysis of the structure of an economy. In two ways SAMs can be used for economic planning. Firstly, a SAM can provide a framework for the organization of information related to economic and social structures of a country's economy. Here the SAM is principally used for monitoring. Secondly, a SAM can serve as a statistical basis for the creation of a model of the economy under consideration. Here the SAM is essentially used for analytical purposes. This model can be used for simulating policy innovation in the economy. A SAM can be expanded or condensed depending on the specific circumstances and needs. Extending the SAM with environmental and social indicators is becoming increasingly common.

The environmental accounts provide data on the impact of the economy on the environment and the "use" of the environment by the economy. Environmental accounting integrates environmental data with the national accounts at the national, regional or industry level. Accordingly, environmental data can be compared directly

with macroeconomic indicators such as GDP and value added. Work areas range from accounts for natural resources, such as the extraction of oil and gas, to material use and emissions data, such as on CO_2 and waste. The environmental accounts are internationally comparable through common frameworks, concepts and methods.

Environmental accounting has a long history of international coordination culminating in the System of Integrated Environmental and Economic Accounting (UN et al., 2003). The SEEA handbook was produced to provide an overview of a variety of environmental accounts. Recently, the UN Committee of Experts on Environmental Economic Accounting (UNCEEA) has been established. The main objectives of this committee are to elevate the system of environmental accounts to an international statistical standard and to advance the implementation of SEEA in all countries. In Europe, Eurostat has stated to give high priority to the further development of the environmental accounts (Eurostat, 2003). On a national level, there is also a great deal of interest in the environmental accounts, as environmental institutes and ministries use this data for environmental economic analyses and policy development.

The Dutch environmental accounts consist of several parts (Statistics Netherlands, 2006). The air emissions accounts cover environmental information on climate change (emission of greenhouse gasses, ozone layer depletion, acidification, and local air pollution). In the energy accounts the supply and use of energy products is shown both in physical and monetary terms. The waste accounts record the production of 70 different kinds of solid waste and how these are treated. The water accounts (NAMWA, the National Accounting Matrix including Water Accounts) include both the production and consumption of water (tap water, groundwater, surface water), and the emissions of hazardous substances to water (heavy metals, nutrients, pesticides, et cetera). These accounts have been developed both on a national and on a river basin level. The Dutch environmental accounts also include some monetary accounts related to environmental subjects, namely the environmental expenditure accounts and the environmental tax accounts. Finally, monetary and physical accounts are combined in the NAMEA-matrix (the National Accounting Matrix including Environmental Accounts). The linkage of monetary and physical data in the NAMEA guarantees a consistent comparison of environmental burdens to economic benefits or, the other way around, environmental benefits and economic costs. In this way, the contribution of national accounting conventions to a sound attribution of pollution to activities can be seen clearly (De Haan, 2004).

A number of different satellite accounts has been created, such as for safety, knowledge and productivity. Each of these accounts produces statistics which are implicitly included in the national accounts, or are a combination of different sources of information including the national accounts. The establishment of a satellite account on safety/security describes in detail the supply and use of goods

and services in the area of safety in line with SNA93 (Statistics Netherlands, 2003; Kleingeld et al., 2006). These goods and services are not only supplied by government institutions, like police and army, but also by private companies, such as security firms, law firms and insurance companies.

Investigations in the area of Research and Development (R&D) in SNA93 are part of the satellite account on knowledge (Statistics Netherlands, 2003; De Haan and Van Rooijen-Horsten, 2004). R&D presently is not considered an activity leading to the creation of intangible assets within SNA93, though this is expected to change in the forthcoming SNA update. Knowledge is closely linked to the measurement of wellbeing as it affects the future of society in its core. Sustainability of an economy is highly dependent on the stock of knowledge within a society, which makes, for instance, the capitalization of R&D efforts relevant. Productivity statistics are considered a key priority at Statistics Netherlands, therefore efforts are being made to correspondingly develop productivity accounts (De Haan et al., 2005). These productivity accounts will not be limited to labour productivity only but will also include capital.

Industry categories are established on the basis of production characteristics of enterprises. The activity of the enterprise that produces most of the turnover, value added or uses most of the production time, is the dominant activity and is the basis for determining the industry the enterprise is categorised in. Industries, such as hotels, restaurants and travel agencies, mainly produce goods and services supplied to "visitors". These industries belong, based on their production, to the hotel industry, the restaurant industry and for the travel agencies, to the industry 'other services activities'. Essentially, a tourism industry does *not* exist because tourism is not determined on the basis of the production characteristics of an enterprise. In fact, for goods and services to belong to tourism the consumer, the person who uses the goods and services, has to meet certain characteristics: tourism is a demand or consumption concept. The consumer has to meet criteria, such as making a trip for leisure or other purposes outside his or her usual environment for less than a year, for the consumer to be established as a visitor.

Tourism production, i.e. its supply, takes place when the product is consumed by a visitor (TSA: RMF, par. 4.79). Thus, tourism supply is part of various industries such as hotels, restaurants, entertainment, retail and wholesale trade and transportation. The Tourism Satellite Account is developed to make tourism and the economic significance of tourism explicit.

2.6   *The Tourism Satellite Account framework*

Statistics on tourism in most countries consist of numbers of visitors, socioeconomic characteristics of visitors, duration of stay, hotel capacity and occupancy, et cetera.

These statistics are not related to macroeconomic statistics which, for instance, measure the performance of the economy of a country. For policy making and decision taking an instrument is needed which links statistics on tourism to other macroeconomic statistics in a framework, such as the national accounts. Within the System of National Accounts tourism is included in the estimates, but is not made explicit. There is not one separate tourism industry in the presented industries: tourism is nested in many industries to a greater or lesser extent.

Industries in the national accounts are established on the basis of production characteristics of the establishment. In SNA93 an establishment is defined as 'an enterprise, or part of an enterprise, that is situated in a single location and in which only a single (non-ancillary) production activity is carried out or in which the principal productive activity accounts for most of the value added' (par. 5.21). The classification is conducted using a classification scheme such as the International Standard Industrial Classification (ISIC). ISIC provides a hierarchical set of categories of economic activities. Four levels of tabulation categories can be distinguished. At the division and group levels, substantial weight is placed on the nature of the goods or services that are produced as the principal product of the activity in question. ISIC can be used for decomposing production statistics according to types of activities.

However, the characteristics of the person using the goods and services determine whether or not the consumption of a product belongs to tourism. The production or supply of tourism goods and services only takes place when the product is consumed by a "visitor". Because tourism is not identified as a separate industry within the System of National Accounts, the Tourism Satellite Account has been developed. Within each of the industries in the national account, the tourism component is identified and separated from the rest of the industry. In a TSA the tourism component of each industry of the national accounts is derived without disturbing the industry totals. These tourism components together constitute tourism expenditure, consumption, et cetera.

The TSA consists of a set of ten tables (see box 1.1 in chapter 1) addressing different aspects of tourism such as tourism expenditure, tourism consumption, tourism value added, tourism investment, tourism employment, tourism government final consumption and some non-monetary statistics. The TSA is embedded in the System of National Accounts (SNA93) which makes tourism aggregates comparable to macroeconomic statistics like gross domestic product (GDP) and total consumption. A Tourism Satellite Account is developed to capture tourism and its specific characteristics.

Tourism satellite accounting is the result of years of effort and international discussions dating from the late 1970s. In 1983 the first WTO proposal stressed

the need for a "uniform and comprehensive means of measurement and comparison with other sectors of the economy" following the recommendations of the SNA of that time (UN, 1968; TSA: RMF, UNSD et al., 2001, p. X). The OECD contributed to the discussion in 1991 with the development of its "Manual on Tourism Economic Accounts". The recommendations of the Ottawa conference on definitions and classifications were adopted in 1993. Hereafter, the WTO and OECD started to develop the conceptual framework of a tourism satellite account. With the manual 'Tourism Satellite Account: Recommended Methodological Framework' (TSA: RMF, UNSD et al., 2001) a common conceptual framework for the development of the methodological design of a TSA was established in cooperation between the World Tourism Organisation (WTO), the OECD, United Nations Statistical Division (UNSD) and Statistical Office of the European Communities (Eurostat). The introduction of the Tourism Satellite Account has met the need for harmonized and detailed statistics with a solid macroeconomic base.

On the other hand, the case of the methodological framework, which has been presented in the different manuals and ultimately has been put forward in the recommended framework for the TSA (TSA: RMF), is not closed. There are still a number of methodological and conceptual issues which invite reflection and (international) debate. I will discuss different issues and debates referred to later in this study.

2.7   Summary and conclusions

The SNA provides macroeconomic insight into the economy of a country. The guidelines and concepts of the SNA, which have been established over the decades, are the basis for international comparative statistics. The SNA is sufficiently flexible so that a very diverse set of countries can use its concepts and guidelines for the compilation of the national accounts for their economies. On the other hand, specific alternative concepts, classifications and accounting rules are not implemented in the central framework of the SNA but in its satellite accounts. Satellite accounts incorporate the link with the main system and its macroeconomic indicators but also give room to the inclusion of alternative methodology, such as physical data compared with monetary data.

Environmental accounts are an example of a commonly used satellite account. Physical data on pollutants are incorporated in this satellite account. The Tourism Satellite Account (TSA) is another example of an extension of the SNA. In the Tourism Satellite Account an alternative classification for economic activities is used to clarify the role of tourism in an economy.

In chapter 1, the central question has been formulated:

How should an accounting system be structured that can provide answers on tourism policy at the national and sub-national level?

The introduction of the TSA has partly answered this central question. The TSA provides tourism statistics that give insight in the macroeconomics of tourism. In the coming chapters I will discuss a number of methodological questions and several TSA extensions.

Notes

[1] The equations are: 1) the production approach: production minus intermediate consumption plus balance taxes less subsidies on products and difference in VAT, 2) the income generation approach: compensation of employees plus balance taxes and less subsidies on production and imports plus operating surplus/mixed income plus depreciation, and 3) the final expenditure approach: consumption plus gross fixed capital formation plus changes in inventories plus exports of goods and services minus imports of goods and services. The outcomes of these three approaches are equal in balanced supply and use tables.

[2] A recent historic outline of the development of the System of National Accounts is given in Bos (2003).

[3] The debate has been going almost continuously since then, not always favourable to Quesnay's insights. Recently Steenge and Van den Berg (2007) were able to show that a specific part of Quesnay's views has not been represented well in Phillips' work and in subsequent studies.

[4] Stone received the Nobel Prize in Economics for this and related work in 1984. For his views expressed in his Nobel Memorial Lecture titled "The Accounts of Society", see Stone (1984).

[5] We should recall that systems constructed along entirely different lines have co-existed for a long time – and still exist in certain countries. For an alternative system in the Marxian tradition, see e.g. Shaikh and Tonak (1994).

[6] For a comprehensive overview of the sequence of accounts I refer to chapter 2 of SNA93.

[7] The balancing items presented in figure 2.3 reflect the structure of each account. The amounts on the use side (payables) are deducted from the amounts at the resource side (receipts) to calculate the balancing item.

[8] A more extensive answer to the question 'what is a SAM?' can be found in a contribution of King (1985). For some other literature on SAM, see Pyatt and Round (1985) and Leadership Group SAM (2003).

3. Basic concepts of tourism

3.1 Introduction

For further analysis, it is important to establish clearly what tourism is. Below I shall discuss the core concepts of TSA. Occasionally we shall see that TSA concepts differ from those in earlier accounting systems such as SNA93. In fact, we can observe newly introduced concepts such as 'usual environment' next to common concepts such as 'residency'. At the end of this chapter I shall 'draw up the balance'.

Tourism, following the TSA (TSA:RMF, par. 1.1) is defined as "the activities of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes not related to the exercise of an activity remunerated from within the place visited". The persons referred to in this definition of tourism are called visitors. A visitor is "any person travelling to a place other than that of his/her usual environment for less than 12 months and whose main purpose of trip is other than exercise of an activity remunerated from within the place visited" (TSA: RMF, par. 2.4).

Within the definition of tourism, there are three criteria which differentiate a visitor from other travellers. These three criteria are:
– The trip should be to a place other than that of the usual environment. This excludes more or less regular trips between the place the person carries out work or study and the place of domicile.
– The stay in the place visited should not last more then twelve consecutive months. After this period the visitor becomes a resident from a statistical point of view.
– The main purpose of the visit should be other then the exercise of an activity remunerated from within the place visited. This excludes migratory movements.

Within SNA93 the concept of residency plays an important role[1]. The residency of a person or institutional unit, such as an enterprise or foundation, determines if this person or institutional unit should be included in the national accounts statistics of the country. Only the production of a resident enterprise, for instance, is included in the national income of the respective country. The concept of residency formulated in the SNA93 also uses the boundary of staying or planning to stay for more then a year in a certain place. In the TSA the concept of usual environment is used. The concept of residency used in the SNA93 does not coincide with the concept of usual environment in the TSA. The place a person works is clearly part of the usual environment of this person but is not necessarily also the place of residency (TSA: RMF, par 2.10–2.13). Border workers can, for instance, live

in one country, pay taxes and have their kids at school there, but work across the border in another country. In this case the work place and home are both part of the usual environment of the person, but the person is only resident in the country he or she lives in. The concept of residency is applied in the TSA to determine the kind of tourism in the TSA such as inbound tourism. The two concepts are used next to each other and for different purposes. These concepts should not be confused with each other.

For a person to become a visitor, the place visited needs to be outside his or her usual environment. The visitor is not considered part of the usual consumers patronising enterprises in the visited place. Therefore, expenditures of the visitor will generate additional expenditure in this place. This extra expenditure of visitors as opposed to receipts from the ordinary consumers can be considerable for certain businesses. This activity lies at the basis of what the TSA wishes to measure.

It is possible to typify markets based on additional characteristics of visitors and their trips. In line with this, TSA distinguishes different kinds of tourism (TSA: RMF, par. 2.61):
– Inbound tourism is defined as "the tourism of non-resident visitors within the economic territory of the country of reference";
– Domestic tourism is defined as "the tourism of resident visitors within the economic territory of the country of reference". Both nationals and foreigners are included in the concept of domestic visitors;
– Outbound tourism is defined as "the tourism of the resident visitors outside the economic territory of the country of reference and provided by non-residents";
– Internal tourism is defined as "the tourism of visitors, both resident and non-resident, within the economic territory of the country of reference".

3.2   Purpose of the visit

In common language, tourists are individuals who travel for leisure, recreation and holidays. However, within the TSA the definition of visitors is much broader than this and includes all individuals who travel to or visit a place for a purpose other than the exercise of an activity remunerated from the place visited. Visiting friends and relatives, traveling for health treatment, religion and pilgrimages are among the main purposes for visitors. A business or commercial traveler may or may not be a tourist. This depends on the place from where the person is paid and how the person undertakes the activity.

The expenditures of business travelers are part of the intermediate consumption of companies, which is different from recreational tourism. The expenditure of recreational tourism is part of household consumption. For the calculation of total value added or

gross domestic product (GDP) intermediate consumption and household consumption are two different expenditure categories. SNA93 does not allow for items of intermediate consumption to be classified as final consumption expenditure. However, in the set up of the TSA, expenditures on business travel which are paid for by companies, are included in tourism consumption. The reasoning behind this is that business travel may play a significant role in a country's or region's economy. Therefore, it is of interest to have statistics available on these expenditures.

The issue of the inclusion of the expenditures of business or commercial travel in tourism consumption concerns primarily domestic business travel. In the case of business travel from abroad or going abroad, there is no major conceptual problem to include these consumption expenditures in tourism consumption. This is because the intermediate consumption belongs to a company which is placed outside the economic territory of reference.

In the TSA: RMF manual (Annex V) it is advised to exclude business tourism consumption from tourism value added. The text says "when the calculation of the value added of productive activities is at stake, then these expenditures are classified within intermediate consumption of the activities which pay for them, without considering their specific effect as tourism consumption since any other expenses are considered as intermediate consumption of these activities". However, Libreros (2004, p. 138) points out that "the fact that part of tourism consumption is classified, in terms of national accounts classification of uses, as intermediate consumption, has no effect whatsoever on the value added associated to the process of production responding to this demand". This is a difficult issue which could be reasoned out to a larger extent [2].

In the Dutch TSA calculations have been made to determine the size of domestic business travel. For example, an outing for department heads of a Dutch company for 'teambuilding' to the amusement park "De Efteling" constitutes domestic business travel. This outing is part of the work week of these people and is paid for by the company. The expenditure of this outing is intermediate consumption for the company organizing the teambuilding. On the other hand, the production of "De Efteling" clearly is amusement and should be included in the estimation of tourism. Leaving out parts of expenditure, which are obviously tourism-related, because they are paid for by companies and therefore part of intermediate consumption, is, in my opinion, not a good solution. Tourism could be underestimated in certain cases where domestic business tourism is significant. The inclusion of business consumption in the TSA is clearly an area to be thought out further and where conceptualisation is still in progress.

The fundamental concepts of the TSA framework are laid down in the TSA: RMF manual. The UNWTO [3] has published additional manuals with guidelines on the

measurement of tourism demand (WTO, 2000a) and the measurement of tourism supply (WTO, 2000b). However, the publication of these manuals does not mean the end of the discussion on the measurement of tourism within the TSA framework. The interpretation of the concept 'usual environment' and the treatment of domestic business travel within the concept of tourism value added, are among the issues still being debated. In the next section I shall go into further detail regarding the concept of 'usual environment'.

3.3 The usual environment

Within the definitions of tourism and visitor, the concept of usual environment plays an important role. The usual environment distinguishes a visitor from all other travellers within a location. The usual environment of a person is defined as consisting "of the direct vicinity of his/her home and place of work or study and other places frequently visited" (TSA: RMF, par. 2.6). The usual environment is difficult to define in precise terms. It corresponds generally to the geographical boundaries within a person displaces herself or himself in the regular routine of her or his life.

In the definition of usual environment, two dimensions are presented, namely distance (direct vicinity) and frequency (frequently visited). However, what "direct vicinity" and "frequently visited" means, has to be determined to fit in with the country or region under investigation. The boundaries of the usual environment can be established using dimensions like frequency of visits, distances traveled or formal boundaries of localities.

National statistical organizations are invited to establish their own boundaries of the usual environment, by using distance travelled, frequency of visits or the formal boundaries of localities or other administrative territories (TSA: RMF, par. 2.7). An inventory of the various definitions of the usual environment has shown that countries interpret this concept very different (Canadian Tourism Commission et al., 2003). Canada has used 80 kilometres of distance for a resident to become a visitor. A trip to Niagara Falls would not constitute tourism for someone living only 20 kilometers away. There are other countries which use distances ranging from 25 to 50 kilometres. Distance in time, frequency and motive are also used to differentiate between a visitor and a traveller. The different ways the concept of usual environment is interpreted does not improve the comparability of results between countries, and between various Tourism Satellite Accounts.

The usual environment is primarily an issue for the measurement of domestic tourism. There is an international consensus that the geographic borders of countries form the boundaries for the measurement of international tourism. This means that the

interpretation of usual environment mainly applies to domestic tourism. Domestic tourism can play a significant role in a country's economy, but because of the elusiveness of the concept of usual environment this is difficult to measure. It has been pointed out by Rogers (2002) that the measurement of domestic tourism may have lagged behind international tourism, because of the interpretatory difficulties of the concept of usual environment and how a traveller is known to have left it. Travellers who cross international borders are considered by definition to have left their usual environment because they have left their national geography. Exceptions are border workers, some military and diplomatic personnel and persons enumerated by the place visited, but apart from these groups any traveller who crosses an international border is a visitor. Differentiating domestic travel from domestic tourism can, unfortunately, not be done correspondingly for the international visitor.

An example can help illustrate this point. The concept of usual environment is used for the Netherlands and Aruba in different ways. For the compilation of the Dutch TSA, two important criteria are used to define the term usual environment. The first criterion has to do with the motive for the trip and the second criterion with the duration of the trip. Only if both criteria apply, is the person deemed to be a visitor in the Dutch TSA. A person is a visitor in the Dutch TSA every time he or she makes a trip with a recreational or business motive and with a duration of more than 2 hours from home or work (including travel time). Examples of motives not included in the Dutch TSA are domestic trips to family or friends and for religious purposes. The primary reason that the 2 hour criterion is chosen in the Dutch TSA, is because of the connection with available source data for the TSA (Hoekstra et al., 2006). The data used in the TSA is collected using a number of assumptions. The 2 hours (including travel time) for the trip is one of these assumptions.

The definition of the usual environment primarily plays a role in the measurement of domestic tourism, particularly in the measurement of domestic same-day visitors in the Dutch TSA. People who stay overnight are assumed to have left their usual environment due to the fact that the overnight environment is unusual to them.

The construction of the Dutch TSA includes a calculation to measure the sensitivity of the concept of usual environment. Apart from the above mentioned 2 hour criterion, the TSA results have also been calculated for three distances as other versions of usual environment. These distance criteria mean that recreational and business domestic daytrips are included as tourism if they take place with distances of more than 10 kilometres, 30 kilometres or 50 kilometres from home or from work (Hoekstra et al., 2006).

From table 3.1 we conclude that it matters significantly which definition of usual environment is used for the level of internal tourism consumption and tourism value added. The use of the 2 hours criterion results in the largest tourism value

added compared to the application of the 50 kilometres criterion which has the lowest contribution to total value added. Tourism in total value added decreases from 3.3 percent to 2.1 percent.

Table 3.1
Tourism indicators using different definitions for usual environment, 2002

| | Criteria for usual environment | | | |
	2 hours	10 km	30 km	50 km
	mln euro			
Internal tourism consumption	31 062	26 099	22 746	21 381
Tourism value added	13 498	10 188	9 077	8 580

Source: Hoekstra et al., 2006, p. 22.

The application of the concept of usual environment in the context of the small Caribbean island state of Aruba may prove more of a challenge than expected. Formal boundaries of locality determine the estimation of inbound and outbound tourism in Aruba. For the measurement of domestic tourism the concept of the usual environment has to be established. The standard dimensions for usual environment, distance, frequency and boundaries of localities are difficult to apply to a country of 8 by 30 kilometers. Almost all locations on the island can be reached within one hour by car and, with only a limited number of recreational establishments available on the island, these establishments are often frequented. However, in some way the concept of usual environment has to be applied to Aruba to determine the boundaries of domestic tourism in Aruba.

As distance, frequency or local boundaries seem irrelevant in the situation of Aruba, residents of Aruba visiting tourism establishments for daytrips and overnight stays are included in domestic tourism. For the estimation of domestic tourism in Aruba the usual environment is said to consist of certain establishments in the tourism industries. Included in tourism domestic consumption in Aruba are the expenditures in the local hotels, timeshare resorts, apartments and villa's, bars, full service restaurants, nightclubs and dinner theaters, scheduled air transport, other supporting transport activities, sporting activities and relates services; also sport fishing and hunting, casino activities, water sport activities and other recreational activities [4].

Box 3.1 Special properties of tourism

Tourism has special properties:
– Purpose of travel;
– Usual environment of the visitor;
– Less then one year.

3.4   *The recommended framework*

The TSA consists of a set of ten standard accounts each of which is in the form of a special table (TSA: RMF set of recommended tables, see appendix 3.1 of this chapter for a graphic illustration of the set of TSA: RMF recommended tables). In box 3.2, for ease of reference, I repeat the list of TSA: RMF recommended tables.

Box 3.2 The set of ten TSA: RMF recommended tables

1. Inbound tourism consumption (Visitor final consumption expenditure in cash);
2. Domestic tourism consumption (Visitor final consumption expenditure in cash);
3. Outbound tourism consumption (Visitor final consumption expenditure in cash);
4. Internal tourism consumption (combination of tables 1 and 2);
5. Production accounts of tourism industries and other industries;
6. Domestic supply and internal tourism consumption (combination of tables 4 and 5);
7. Employment in the tourism industries;
8. Tourism gross fixed capital formation of tourism industries and other industries;
9. Tourism collective consumption;
10. Non-monetary indicators.

This set of tables is the same as presented in an earlier publication of the WTO (WTO, 1999). The main accounts are based on the underlying national accounts structure of production, consumption, employment and investment (or more precise) gross capital formation. Statistics on employment characteristics in tourism and tourism characteristics, such as socio-economic characteristics of visitors, are also part of the TSA but are not directly based on national accounting principles. The structure of the TSA is based on a general balance between the supply and the demand of goods and services within an economy, the same concept that underlies the national accounts. The TSA analyses in detail the components of the demand of goods and services which are related to tourism within an economy, and observes how the match with the supply of such goods and services operates within the same compiling economy. The WTO has published two sets of manuals with guidelines, one addressing the measurement of total tourism demand (World Tourism Organization (WTO), 2000(a)) while the other manual is concerned with guidelines for the measurement of the total tourism supply (World Tourism Organization (WTO), 2000(b)).

For explanatory purposes the TSA tables are divided into three groups, depending on the way tourism is approached in the table. There are tables which consist of the

demand aspects in the economy, such as consumption and investment, tables which involve supply aspects in an economy, such as production and employment and the final group of tables includes both demand and supply aspects of tourism. Consumption and investment are counted among the final expenditure categories of the economy, and therefore both represent the demand for goods and services, including durable goods and investment goods.

The demand approach analyses the components of the demand for goods and services by visitors. The tables which concern tourism demand are:
– Inbound tourism consumption (Visitor final consumption expenditure in cash) (table 1 of the TSA: RMF set of recommended tables);
– Domestic tourism consumption (Visitor final consumption expenditure in cash) (table 2 of the TSA: RMF set of recommended tables);
– Outbound tourism consumption (Visitor final consumption expenditure in cash) (table 3 of the TSA: RMF set of recommended tables);
– Internal tourism consumption (table 4 of the TSA: RMF set of recommended tables);
– Tourism gross fixed capital formation of tourism industries and other industries (table 8 of the TSA: RMF set of recommended tables);
– Tourism collective consumption (table 9 of the TSA: RMF set of recommended tables).

The tables inbound tourism consumption (Visitor final consumption expenditure in cash), domestic tourism consumption (Visitor final consumption expenditure in cash) and outbound tourism consumption (Visitor final consumption expenditure in cash) measure the amount of goods and services consumed by visitors. The difference between these three tables is residency of the visitor and country of destination. The first table comprises non-resident visitors and the second and third table both concern resident visitors. The country of destination is in the first two tables the country of reference and in the third table the rest of the world, abroad. In the fourth table of the TSA framework, internal tourism consumption, statistics on inbound and domestic consumption are combined.

Also, part of final demand specific for tourism are investments in the table 'tourism gross fixed capital formation of tourism industries and other industries', and the consumption of collective government services by visitors in the table 'tourism collective consumption'.

The tables associated with the supply approach are:
– Production accounts of tourism industries and other industries (table 5 of the TSA: RMF set of recommended tables);
– Employment in the tourism industries (table 7 of the TSA: RMF set of recommended tables).

The production of goods and services is part of the supply side of the economy. Production together with import constitutes the total supply of goods and services in the economy. The goods and services consumed by visitors, resident and non-resident, are part of tourism output. In the table 'production accounts of tourism industries and other industries' this production is shown for each industry category. The industry 'hotels' produces lodging services, which are consumed by visitors.

The table 'employment in the tourism industries' concerns aspects of employment such as number of jobs, number of establishments and number of employed persons. These statistics indicate the role tourism plays in the employment of an economy.

There are two tables left which address both the demand and supply side of tourism. These tables are domestic supply and internal tourism consumption and non-monetary indicators. The reconciliation between production and imports on one side and consumption and investment on the other side is one of the main distinguishing elements of the national accounts. In the TSA tourism production and tourism consumption are being confronted and reconciled in the table on domestic supply and internal consumption. This reconciliation takes place in the table, 'domestic supply and internal tourism consumption' (table 6 of the TSA: RMF set of recommended tables).

The table on non-monetary indicators (table 10 of the TSA: RMF set of recommended tables) includes aspects of tourism demand such as the number of arrivals and number of overnights, and supply aspects such as occupancy rate, the number of rooms, number of establishments and number of beds available.

3.4.1 The Demand approach

In the same way as the visitor is at the center of the tourism activity, visitor consumption is at the center of the economic measurement of tourism. A visitor is viewed as a particular type of consumption unit, who is only distinguished from other households in such a way that he or she is outside his or her usual environment or intends to leave it soon. Visitor consumption is defined as "the total consumption expenditure made by a visitor or on behalf of a visitor for and during his/her trip and stay at destination" (TSA: RMF, par. 3.8). Visitor consumption is not restricted to predefined goods and services produced by predefined industry. The components of visitor consumption are: visitor final consumption in cash, visitor final consumption expenditure in kind, tourism social transfers in kind and tourism business expenses (TSA: RMF). The majority of visitor consumption will consist of visitor final consumption in cash.

The table 'inbound tourism consumption' (table 1 of the TSA: RMF recommended set of tables) addresses the expenditure of non-resident visitors in the compiling country. Inbound tourism consumption "comprises the consumption of non-

resident visitors within the economic territory of the country of reference and/or that provided by residents" (TSA: RMF, par. 2.61). The goods and services purchased in the country may have been imported. Included as inbound visitors, are nationals residing abroad on a permanent basis. In this table, two categories of visitors are distinguished, same-day visitors and stay-over visitors.

Domestic tourism consumption consists of the tourism expenditures of residents (table 2 of the TSA: RMF set of recommended tables). Separate columns are included in this table for resident visitors traveling within the country of reference and for resident visitors traveling to a different country. Domestic tourism consumption contains, besides the consumption of resident visitors on daytrips and overnight stays, the domestic portion of outbound tourism consumption (TSA: RMF, par. 2.62).

Outbound tourism consumption is, therefore, all consumption that takes place outside the economic territory (table 3 of the TSA: RMF recommended tables). The goods and services are provided by non-residents. Outbound visitors are also divided in same-day visitors and tourists (stay-over visitors). In the case of the Netherlands, outbound tourism comprises, for instance, Dutch residents visiting Paris and consuming goods and services there (hotel stay, meals). In national accounts terms, outbound tourism consumption constitutes import for the economy of the resident country. In the case of the previous example, this is the Netherlands. Surveys are used to gain insight into the expenditure patterns of residents going abroad. In case residents go abroad to visit certain shops, policy makers could decide to introduce these shops in their country, thereby turning these expenditures back to the local economy.

Internal tourism consumption (in cash and kind) (table 4 of the TSA: RMF recommended tables) comprises all consumption of visitors, both resident and non-resident, within the economic territory of the country of reference and/or that is provided by residents (TSA: RMF, par. 2.61). The goods and services purchased in the country can have been imported. Internal tourism consumption is the sum of domestic tourism consumption, inbound tourism consumption, consumer durables and tourism social transfers in kind (TSA: RMF, par. 2.65). For each product category, internal tourism consumption is shown.

Consumer durables are defined in SNA93 as a good "which may be used for purposes of consumption repeatedly or continuously over a period of a year or more" in this definition "a normal or average rate of physical usage" is assumed (par. 9.38). Consumer durables can be purchased at any time, during trips, for trips, after a trip or outside the context of trips. They usually have multiple uses and therefore require specific treatment in the TSA (TSA: RMF, par. 2.49). Two kinds of consumer durable goods are to be included in tourism consumption. Firstly, single purpose consumer

durable goods, which are used almost exclusively on trips, like luggage, tents and other camping equipment. Secondly, multipurpose consumer durable goods, that are used on trips but also within the usual environment, like cameras, radio's and cars, are only to be included in tourism consumption if purchased during a trip [5].

Social transfers in kind consist of "individual goods and services provided as transfers in kind to individual households" (SNA93, par. 8.99). These individual goods and services are provided by general government or non-profit institutions serving households (NPISH). Visitors may be consuming these services, which is why these social transfers in kind, between general government or NPISH and visitors, are considered part of visitor consumption. For the services to be included, there has to be a clear link between the visitor and the provider of the service. Services, like health services provided to visitors, or certain museum visits, where the total cost are not included in the ticket, are examples of social transfers in kind (TSA: RMF, par. 2.55) [6].

The table on internal tourism consumption is of special interest for many countries and regions. The promotion of domestic or inbound tourism can have large consequences on economic performance indicators such as GDP and employment. Policy makers and decision takers are therefore primarily interested in the tables on tourism expenditure. Outbound tourism consumption estimates the consumption of residents outside the economic territory of the country of reference. Within the national accounts, but also within the TSA framework, the estimation of outbound consumption gains relatively less attention, even though the flows of money leaving the country may be significant, compared to the GDP of a country. The lack of interest of many countries in the magnitude and composition of outbound tourism consumption can be explained by the fact that this kind of expenditure takes place outside the economic territory of the country of reference. Expenditures outside the economy do not contribute to the economic performance of a country or its employment. However, what should be kept in mind is that insight in the expenditure of residents abroad can indicate ways to keep these expenditures domestic instead of the money leaving the economy.

Tourism gross fixed capital formation of tourism industries and other industries (table 8 of the TSA: RMF recommended tables) constitutes investment associated with tourism. Investment is one of the final expenditure categories found in the use table. Gross fixed capital formation is produced by industries, such as construction and manufacturing of machinery. Machinery or buildings are later used in the production of goods and services.

The measurement of tourism gross fixed capital formation emphasizes the existence of a minimal infrastructure in terms of transport, accommodation, recreation, et

cetera, for tourism. Gross fixed capital formation determines to a large extent the nature and scale of visitor flows in future. Concepts and guidelines for the estimation of tourism gross fixed capital formation have so far been limited. The methodology behind the compilation of tourism gross fixed capital formation and the application of this methodology, form part of chapter 5 of this study.

Tourism collective consumption (table 9 of the TSA: RMF framework) measures the use of certain government services by visitors. Public authorities produce non-market collective services, like the maintenance of order and security, and the maintenance of public space, which are fundamental to the basic structure and organisation of a society. Visitors consume part of these collective services. In chapter 6 of this study the methodology of the measurement of tourism collective consumption is analysed and applied.

Internal tourism consumption is one of the aggregates in the TSA combining domestic tourism consumption, inbound tourism consumption, consumer durables and tourism social transfers in kind. A broader aggregate than internal tourism consumption is tourism demand. Total tourism demand is the sum of internal tourism consumption, tourism gross fixed capital formation and tourism collective consumption (TSA: RMF, par. 4.117). The concept of tourism demand focuses on the total demand related to visitors. However, the estimation of this concept, although included in the TSA: RMF manual, is postponed until more experience is obtained and methodological research has been carried out (TSA: RMF, par. 4.118). The inclusion of tourism gross fixed capital formation and tourism collective consumption in tourism demand poses some specific problems. Some insight in these problems is given in chapter 5 for tourism investment and in chapter 6 for tourism collective consumption.

3.4.2 *The Supply approach*

Visitors consume goods and services provided by establishments. Not all goods and services have the same relevance for the estimation of the impact of tourism on a country's or regions' economy. It is convenient to distinguish the types of goods and services that are specific to tourism. "Characteristic products" are typical for tourism. Tourism characteristic products are "products which, in the absence of visitors, in most countries would probably cease to exist in meaningful quantity or for which the level of consumption would be significantly reduced and for which it seems possible to obtain statistical information" (TSA: RMF, p. 87). The set of characteristic products is restricted to services, goods cannot be characteristic. Goods such as camera's, walking boots and backpacks, are often bought for tourism purposes, but are often also used for non-tourism purposes. The second category consists of connected products. Tourism connected products are "a residual category, including those products that have been identified as tourism-specific in a given country but for which this attribute has not been acknowledged on a

worldwide basis" (TSA: RMF, p. 87). The set of both tourism characteristic and tourism connected products are tourism specific products.

The economic analysis of tourism requires the identification of the consumption of goods and services that visitors acquire, and therefore the identification of the economic units that produce those goods and services. The productive activity that produces a principal output, which is identified as characteristic of tourism, is called a tourism characteristic activity. For international comparability purposes, a list of tourism characteristic activities, such as hotels and restaurants, transportation, support activities for transportation, travel agencies and arts, entertainment and recreation, has been determined at an aggregated level. Productive activities that produce output identified as connected to tourism, are called connected activities. The International Standard Industrial Classification of All Economic Activities, Third Revision (ISIC Rev. 3; UNSD, 1989) and Central Product Classification (CPC; UNSD, 1997) are extended to include more detailed activities and products characteristic for tourism. The Standard International Classification of Tourism Activities (SICTA) is based on the ISIC classification with extensions towards tourism activities. These tourism specific activities are located at a detailed level and may include activities such as searching sea shells and taking out tourists on nature walks.

The production accounts of tourism industries and other industries present the supply of goods and services to visitors (table 5 of the TSA: RMF set of tables). The various characteristic activities and characteristic products are explicitly included in the table, whereas the connected and non-specific industries are presented on an aggregated level. Intermediate consumption has been added to the production table. The inclusion of intermediate consumption facilitates the calculation of tourism value added. Total gross value added is distributed over the components of value added, respectively compensation of employees, other taxes less subsidies on production, gross mixed income and gross operating surplus.

Employment in the tourism industries is found in table 7 (of the set of TSA: RMF framework). For the tourism characteristic industries the number of establishments, jobs and employed persons are compiled in this table. A division by gender is included, as well as the employment status, that is employee or other, i.e. contributing family workers, self-employed workers, et cetera. Tourism employment expressed in monetary terms is found as wages and salaries, or compensation of employees, in the table on tourism supply and the table including tourism supply and consumption.

Employment plays an important role in the economic analysis of productive activities. The information presented in the table 'employment in the tourism industries' (table 7 of the TSA: RMF recommended set of tables) gives a good overview of the impact of tourism on employment. Conclusions about the number of persons

employed in tourism characteristic activities compared to other activities, can be drawn with this table. Due to the importance of employment in an economy and because the table 'employment in the tourism industries' does not contain all required information for a close study of tourism employment, the OECD has developed an employment module. In the OECD (2000) manual on the TSA and employment, an employment module has been developed to see the relationship between employment and tourism. The labour module consists of a set of 15 tables listing wages, hours worked, working scheme (full-time/part-time), employee characteristics (like sex, age and nationality), full-time equivalent, et cetera. This employment module pays attention to tourism employment from a different perspective. These aspects relate to employment as a social phenomenon, production factor and as a tradable product on the labour market. Austria is among the countries that have implemented the employment module in their TSA (Laimer and Öhlböck, 2004). Canada has published a report on tourism employment in rural Canada and an implementation of the employment module (Beshiri, 2005). Several other organisations, such as the European Commission and the ILO, have shown an interest in the relationship between tourism and employment (The European parliament et al., 1999; ILO, 2004).

3.4.3   The reconciliation

Domestic supply and internal tourism consumption (table 6 of the TSA: RMF recommended set of tables) is the core table of the TSA framework. This table presents the supply by the tourism industries and consumption by visitors in terms of goods and services and production activities. In the table tourism supply is confronted with tourism demand, therefore the table is not specific to the demand or supply approach.

The table shows which part of production meets tourism consumption and which part comes from imports. In the confrontation of domestic supply and internal tourism consumption value added is calculated. The economic importance of a productive activity is usually measured by its value added or share of total value added. As noted before, value added measures the additional value created by a production process. Gross value added is defined as the value of output less the value of intermediate consumption. Net value added is then calculated by deducting consumption of fixed capital from gross value added. The value added of the tourism industry can be estimated as the sum of value added of each tourism industry.

The TSA: RMF recommended framework also includes physical indicators in table 10. Physical indicators are an important component of the TSA and assist in the analysis of tourism. The non-monetary indicators include the number of trips by type of tourism, categories of visitors, duration of stay, number of establishments and their capacity by forms of accommodation, et cetera (TSA: RMF).

3.5   Compilation and data

The compilation of a TSA employs the same kind of methods as the compilation of the national accounts. Two phases can be distinguished in the compilation process. In the first phase, data sources are being processed. The second phase consists of the integration of the data, resulting in a consistent set of figures.

The construction of a TSA is a data-intensive exercise. Data sources have to include a significant level of detail to obtain reliable estimates of the different aggregates. Apart from the national accounts, and the supply and use tables in particular, the TSA also uses large quantities of tourism specific data. Surveys aimed to obtain a picture of tourism are extremely important to supply the level of detail required within the boundaries of the national accounts.

In the first phase, the data is made consistent with the concepts and definitions of the SNA93. Basic data on tourism are, for instance, converted into product and industry classifications of the national accounts on a detailed level. In the process, the data has also been translated to SNA93 (or ESA95) transaction categories.

After all the data sources have been processed, the integration stage starts. In this phase, several aspects can be distinguished:

1. The integration of consumption and production. Several sources supply information on tourism consumption and production. Matching the results of different surveys is not a straightforward task, as results on overlapping questions usually tend to deviate to some extent. The difference in the way questions are posed, the year a survey is held, and differences between the respondents the survey is targeting, provide some explanation of the deviation of results. The TSA framework facilitates the confrontation of supply data, which generally originate from the national accounts, and use data, supplied by different tourism specific surveys. *This confrontation of data is one of the strong points of the SNA and facilitates a thorough analysis of the data and data sources*.

2. The use of non-monetary indicators. Non-monetary indicators can facilitate and improve the integration process of the TSA. These indicators supply additional information for the estimation of transactions or validation of an estimation. For instance, if information on the expenditure of transportation services is integrated, then the number of trips, the number of kilometres or passenger shares has to be in line with the respective expenditure data.

3. The consistency with the national accounts figures. The TSA results are made consistent with the supply and use tables of the national accounts. Tourism consumption of a certain good or service cannot add up to a figure larger than the total supply of this good or service as registered in the national accounts. For example, recreational expenditures of visitors should not exceed their total consumption, as registered in the national accounts. *The supply and use tables thus provide boundaries for the TSA*.

During the integration phase, problems with under- and overestimation or other problems in the basic data are identified and corrected. The integration phase results in a consistent data set where supply is equal to use at the macro and micro levels.

Box 3.3 Some well-known data sources for the TSA
 – production surveys;
 – household surveys;
 – visitor surveys;
 – custom declaration forms;
 – import and export information;
 – non-monetary indicators (such as quantities, prices, distances, percentages, or shares);
 – business census information;
 – the tables of the System of National Accounts.

3.6   Is there an "ideal TSA"?

What does the ideal TSA look like? Or, better perhaps, what should an "ideal TSA/ tourism framework" look like? It is impossible to give a single answer to this question. Basically, the data requirements of a country, and therefore the ideal TSA, depend on the country and its interest in tourism.

Countries with little economic diversification and a large share of GDP and employment in tourism follow a different strategy than those strategies adopted by countries with a highly diversified economy and a small share of tourism in GDP and employment. Developing and following a strategy in tourism for these different kinds of countries elucidates that there are different needs for tourism statistics; there is a different *emphasis*. The tourism-dependent country, which is how the first type of country is typified, needs an extensive set of information on tourism and on various aspects related to tourism. The information has to be placed in a context, i.e. in a specific and well-adapted framework. The tourism statistics are related to other macroeconomic statistics. This elucidates the interactions between the relevant variables which is most important for gaining insight. Strategies and decisions do not stand alone in an economy; all actions have consequences. For a good strategy or decision to work and to have the intended effect, information is required that brings to the fore the dependence of one variable on another. *A set of individual unrelated indicators is not as powerful as a set of related indicators which are based on a well-designed framework and that include interactions.* This would suggest a framework which goes beyond the basic TSA framework which is presented in the TSA: RMF manual.

A tourism-independent country, which is the classification for the second type of countries, benefits from having information on tourism, but is not entirely dependent on this information. A tourism strategy may not be specifically formulated or only to a limited extent, with relatively few data requirements. Tourism in these countries is not specifically addressed, but follows the same general patterns as those of many other industries of the same size. The growth potential of tourism relative to, for instance, agriculture, which often is characterized as a declining industry, would suggest that making tourism explicit in the national accounts is warranted. The TSA framework as recommended in the TSA: RMF manual, emphasises the confrontation of tourism consumption and its supply. This certainly adds to our insight in the role of tourism in the country. But the investment in an extensive tourism-based framework beyond the basic framework may not "pay back".

The TSA framework, as presented by the UNWTO and associated organisations, produces a middle road. It is not an elaborate framework providing the detail, interactions, modelling possibilities, and connections between the variables necessary for the tourism-dependent country. For these countries, the suggested extensions may provide the required extra information. Tourism-independent countries may find the TSA framework too extensive and can limit their TSA compilation to the confrontation of tourism consumption with tourism supply, which then provides sufficient information regarding the contribution of tourism in the economy.
Clearly, there is a third category of countries -or better- the previously presented countries represent extremes on a gliding scale of countries. The countries "in the middle" are not dependent on tourism, but tourism has a good share of the country's economy. The set of countries and their dependence on tourism should be viewed as offering a continuous spectrum, and not as the existence of two extremes (which have entered the discussion in this study a number of times). The needs for statistics on tourism can also be found on the same gliding scale.

To return to the original question of what an ideal TSA could look like -as can be concluded from the previous discussion- the answer depends on the country one is focusing on, and the role tourism plays in that country. The TSA framework has to be adjusted to the statistical needs of the policy makers, decision takers and other stakeholders in the country, and the data possibilities offered. A need for extensive statistics may not be compatible with a limited budget and a small statistical base in a country. The optimal balance has to be found, taking into account the needs and the data capabilities of the country of reference, not the requests of extraterritorial organisations or governments.

3.7   Summary and conclusions

The TSA framework addresses production, consumption, investment and employment aspects of tourism. Tourism is made explicit in the TSA framework. It is difficult to

define what exactly is included in tourism and what is not, yet this is very important. The concept of "usual environment" plays an important role in the estimation of domestic tourism. However, at the moment this concept is not defined unambiguously. For statistics on domestic tourism to be internationally comparable, this concept has to be applied, using a limited number of measurement methods. Unfortunately, the concept of "usual environment" is not easily expressed in measurable and widely applicable aspects. It is not clear yet how exactly this can be done in a manner so that the definition is still workable.

In the next chapter, the TSA of the Netherlands and Aruba, two very different countries, are discussed to illustrate different aspects of the TSA framework. An advantage of the presentation of these very different countries is that they offer an interesting platform for addressing various compilation issues of the TSA in their proper context.

In the discussion of the various recommended tables, it has been pointed out that certain accounts still have some extensive methodological issues which have to be addressed. The estimation of tourism gross fixed capital formation and tourism collective consumption clearly needs attention to work out various measurement issues. So far, little experience has been gained in the compilation of these statistics. This may account for the large number of questions surrounding these tables. This study will pay attention to these issues in the next chapters.

Summarizing: the most important aspect of the TSA and its implementation in a country is that the statistics its supplies meet the needs of the country, its policy makers and decision takers. The budget and data collection capabilities of the countries restrict the possibilities.

The TSA includes some indicators of interest for policy makers and other stakeholders, such as the share of tourism in GDP and a breakdown of the importance of tourism over the different industries and product categories. However, the TSA framework is a more recent development compared to SNA93. In the same way as SNA93, the TSA has to be developed further. Discussion on and application of the methodology, concepts and guidelines are an important part of the TSA development. We are not there yet, but hopefully we are on the right track.

Notes

[1]   An institutional unit is said to be resident within the economic territory of a country when it maintains a centre of economic interest in that territory – that is, when it engages or intends to engage, in economic activities or transactions on a significant scale either indefinitely or over a long period of time, usually interpreted as one year (SNA93, par. 1.28). Examples are Chinese students (with the Chinese nationality) starting their 4-year education in Groningen in September 2008. These students have the intention to stay more then a year in

the Netherlands and are living and studying in the Netherlands, which makes them resident in the Netherlands.

2) McNicoll (2004) addresses some issues concerning the treatment of business Tourism with respect to the TSA of the United Kingdom.

3) The United Nations World Tourism Organization (UNWTO) was the previous World Tourism Organisation (WTO).

4) Trips to the drive in of fast food restaurants are excluded as well as public transportation which is used for commuting.

5) More information on the treatment of consumer durables within the TSA framework can be found in the OECD manual (2000, p. 29–30), WTO manual (2000a, par. 2.16–2.21) and in the TSA: RMF (par. 2.49–2.53).

6) The concept of social transfers in kind and its measurement within the TSA framework is described in SNA93 (par. 8.99–8.105) and WTO, 2000a (par. 3.13–3.37).

Appendix 3.1

The set of TSA: RMF recommended tables are copied here (TSA: RMF, p. 75–84).

Explanation of notes:

X Does not apply.

(1) Corresponds to the margins of travel agencies.

(2) Corresponds to the margins of tour operators.

(3) The value is net of the amounts paid to travel agencies and tour operators.

(4) The value is net of distribution margins.

(') This set of visitors refers to those resident visitors whose trip will take them outside the economic territory of the country of reference. These columns in clude their consumption expenditure before departure or after their return.

('') Due to the fact that some expenditures cannot be associated specifically to anyof these categories of visitors (for instance, single purpose consumer durablesbought or purchased outside the context of a trip), the estimation of domestictourism consumption (which corresponds the last column of the table) willrequire some specific adjustments. Visitor final consumption expenditure incash for all resident visitors is not strictly the sum of this concept for each category of visitors.

(''') These components (referred to as visitor final consumption expenditure in kind, tourism social transfer in kind and tourism business expenses) are recorded separately, as these components are not easily attributable by types of tourism.

* The imports considered here are exclusively those which are purchased within the country of reference.

(a) Even if they are called "products", no goods are included for the time being.

There are two main reasons for that decision:

– the importance of the existing differences (both in the level and structure) between the types of goods acquired by visitors according to the country and place visited;

– the existing limitations of the available sources of statistical information.

Nevertheless, goods are not totally banned form analysis, as retail trade services (specialized and non-specialized) associated with the sale of goods to visitors are included in the list. This is due to the fact that the associated productive activity is an activity in contact with the visitor and thus, given certain circumstances can be viewed as a tourism activity.

Moreover, the list of products included in each of the 7 groups under consideration is shown in Annex II of the TSA: RMF handbook; the explanatory notes for each of them are included in Annex I of the TSA: RMF handbook, in order that they may be clearly identified.

Table A3.1
Inbound tourism consumption, by product and categories of visitors (visitor final consumption in cash) (net valuation), Table 1

Products	Same-day visitors (1.1)	Tourists (1.2)	Total visitors (1.3) = (1.1) + (1.2)
A. Specific products			
A.1 Characteristic products (a)			
1 – Accommodation services			
1.1 – Hotels and other lodging services (3)	X		
1.2 – Second homes services on own account of for free	X		
2 – Food and beverage serving services (3)	X	X	X
3 – Passenger transport services (3)			
3.1 Interurban railway (3)			
3.2 Road (3)			
3.3 Water (3)			
3.4 Air (3)			
3.5 Supporting services			
3.6 Transport equipment rental			
3.7 Maintenance and repair services			
4 – Travel agency, tour operator and tourist guide services			
4.1 Travel agency (1)			
4.2 Tour operator (2)			
4.3 Tourist information and tourist guide			
5 – Cultural services (3)			
5.1 Performing arts			
5.2 Museum and other cultural services			
6 – Recreation and other entertainment services (3)			
6.1 Sports and recreational sport services			
6.2 Other amusement and recreational services			
7 – Miscellaneous tourism services			
7.1 Financial and insurance services			
7.2 Other good rental services			
7.3 Other tourism services			
A.2 Connected products			
distribution margins			
goods (4)			
services			
B. Non specific products			
distribution margins			
goods (4)			
services			
TOTAL			
number of trips			
number of overnights			

Table A3.2
Domestic tourism consumption, by product and ad hoc sets of resident visitors (visitor final consumption in cash) (net valuation), Table 2

Products	Resident visitors travelling only within the country of reference			Resident visitors travelling to a different country(*)			All resident visitors (**)		
	Same-day visitors (2.1)	Tourists (2.2)	Total visitors (2.3) = (2.1) + (2.2)	Same-day visitors (2.4)	Tourists (2.5)	Total visitors (2.6) = (2.4) + (2.5)	Same-day visitors (2.7) = (2.1) + (2.4)	Tourists (2.8) = (2.2) + (2.5)	Total visitors (2.9) = (2.3) + (2.6)
A. Specific products									
A.1 Characteristic products (a)									
1 – Accommodation services									
1.1 – Hotels and other lodging services (3)	x	x		x			x		
1.2 – Second homes services on own account of for free	x			x			x		
2 – Food and beverage serving services (3)	x		x	x	x	x	x	x	x
3 – Passenger transport services (3)									
3.1 Interurban railway (3)									
3.2 Road (3)									
3.3 Water (3)									
3.4 Air (3)									
3.5 Supporting services									
3.6 Transport equipment rental									
3.7 Maintenance and repair services									
4 – Travel agency, tour operator and tourist guide services									
4.1 Travel agency (1)									
4.2 Tour operator (2)									
4.3 Tourist information and tourist guide									
5 – Cultural services (3)									
5.1 Performing arts									
5.2 Museum and other cultural services									
6 – Recreation and other entertainment services (3)									
6.1 Sports and recreational sport services									
6.2 Other amusement and recreational services									
7 – Miscellaneous tourism services									
7.1 Financial and insurance services									
7.2 Other good rental services									
7.3 Other tourism services									
A.2 Connected products									
distribution margins									
goods (4)									
services									
B. Non specific products									
distribution margins									
goods (4)									
services									
TOTAL									
number of trips									
number of overnights									

Table A3.3
Outbound tourism consumption, by product and categories of visitors (visitor final consumption in cash)
(net valuation), Table 3

Products	Same-day visitors (3.1)	Tourists (3.2)	Total visitors (3.3)=(3.1)+(3.2)
A. Specific products			
A.1 Characteristic products (a)			
1 – Accommodation services	X		
1.1 – Hotels and other lodging services (3)	X		
1.2 – Second homes services on own account of for free	X	x	x
2 – Food and beverage serving services (3)			
3 – Passenger transport services (3)			
3.1 Interurban railway (3)			
3.2 Road (3)			
3.3 Water (3)			
3.4 Air (3)			
3.5 Supporting services			
3.6 Transport equipment rental			
3.7 Maintenance and repair services			
4 – Travel agency, tour operator and tourist guide services			
4.1 Travel agency (1)			
4.2 Tour operator (2)			
4.3 Tourist information and tourist guide			
5 – Cultural services (3)			
5.1 Performing arts			
5.2 Museum and other cultural services			
6 – Recreation and other entertainment services (3)			
6.1 Sports and recreational sport services			
6.2 Other amusement and recreational services			
7 – Miscellaneous tourism services			
7.1 Financial and insurance services			
7.2 Other good rental services			
7.3 Other tourism services			
A.2 Connected products			
distribution margins			
goods (4)			
services			
B. Non specific products			
distribution margins			
goods (4)			
services			
TOTAL			
number of trips			
number of overnights			

Table A3.4
Internal tourism consumption, by product and types of tourism (net valuation), Table 4

Products	Visitors final consumption expenditure in cash			Other components of visitors consumption (4.4)***	Internal tourism consumption (in cash and in kind) (4.5) = (4.3) + (4.4)
	Inbound tourism consumption (4.1)*	Domestic tourism consumption (4.2)**	Internal tourism consumption in cash (4.1) + (4.2) = (4.3)		
A. Specific products					
A.1 Characteristic products (a)					
1 – Accommodation services					
1.1 – Hotels and other lodging services (3)					
1.2 – Second homes services on own account of for free	X	X	X		
2 – Food and beverage serving services (3)					
3 – Passenger transport services (3)					
3.1 Interurban railway (3)					
3.2 Road (3)					
3.3 Water (3)					
3.4 Air (3)					
3.5 Supporting services					
3.6 Transport equipment rental					
3.7 Maintenance and repair services					
4 – Travel agency, tour operator and tourist guide services					
4.1 Travel agency (1)					
4.2 Tour operator (2)					
4.3 Tourist information and tourist guide					
5 – Cultural services (3)					
5.1 Performing arts					
5.2 Museum and other cultural services					
6 – Recreation and other entertainment services (3)					
6.1 Sports and recreational sport services					
6.2 Other amusement and recreational services					
7 – Miscellaneous tourism services					
7.1 Financial and insurance services					
7.2 Other good rental services					
7.3 Other tourism services					
A.2 Connected products					
distribution margins					
services					
B. Non specific products					
distribution margins					
services					
Value of domestically produced goods net of distribution margins					
Value of imported goods net of distribution margins					
TOTAL					

Table A3.5
Production accounts of tourism industries and other industries (net valuation), Table 5

TOURISM INDUSTRIES

Products	1 – Hotels and similar	2 – Second home ownership (imputed)	3 – Restaurants and similar	4 – Railway passenger transport	5 – Road passenger transport	6 – Water passenger transport	7 – Air passenger transport	8 – Passenger transport supporting services	9 – Passenger transport equipment rental	10 – Travel agencies and similar	11 – Cultural services	12 – Sporting and other recreational services	TOTAL tourism industries	Tourism connected industries	Non specific industries	TOTAL output of domestic producers (at basic prices)
A. Specific products																
A.1 Characteristic products (a)																
1 – Accommodation services																
1.1 – Hotels and other lodging services (3)	X	X														
1.2 – Second homes services on own account or for free		X														
2 – Food and beverage serving services (3)		X	X													
3 – Passenger transport services (3)		X														
3.1 Interurban railway (3)		X		X												
3.2 Road (3)		X			X											
3.3 Water (3)		X				X										
3.4 Air (3)		X					X									
3.5 Supporting services		X						X								
3.6 Transport equipment rental		X							X							
3.7 Maintenance and repair services		X														
4 – Travel agency, tour operator and tourist guide services		X								X						
4.1 Travel agency (1)		X														
4.2 Tour operator (2)		X														
4.3 Tourist information and tourist guide		X														
5 – Cultural services (3)		X									X					
5.1 Performing arts		X														
5.2 Museum and other cultural services		X														
6 – Recreation and other entertainment services (3)		X										X				
6.1 Sports and recreational sport services		X														
6.2 Other amusement and recreational services		X														
7 – Miscellaneous tourism services		X														
7.1 Financial and insurance services		X														
7.2 Other good rental services		X														
7.3 Other tourism services		X														
A.2 Connected products		X														
distribution margins		X														
services		X														
B. Non specific products		X														
distribution margins		X														
services		X														
Value of domestic produced goods net of distribution margins	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Value of imported goods net of distribution margins																
TOTAL output (at basic prices)																
1. Agriculture, forestry and fishery products														X	X	X
2. Ores and minerals														X	X	X
3. Electricity, gas and water														X	X	X
4. Manufacturing														X	X	X
5. Construction work and construction														X	X	X
6. Trade services, restaurants and hotel services														X	X	X
7. Transport, storage and communication services														X	X	X
8. Business services															X	X
9. Community, social and personal services															X	X
Total intermediate consumption (at purchasers' price)																
Total gross value added of activities (at basic prices)																
Compensation of employees																
Other taxes less subsidies on production																
Gross Mixed income																
Gross Operating surplus																

Table A3.6
Domestic supply and internal tourism consumption, by products (net valuation), Table 6

Products	TOURISM INDUSTRIES														TOTAL tourism industries		Tourism connected industries				Non specific industries				Total output of domestic producers (at basic prices)	Imports *	Taxes less subsidies on products of domestic output and imports	Domestic supply (at purchasers price)	Internal tourism consumption	Tourism ratio on supply
	1 - Hotels and similar		2 - Second home ownership (imputed)		***				12 - Sporting and other recreational services								output	tourism share	output	tourism share	output	tourism share	output	tourism share						
	output	tourism share	output		output	tourism share			output	tourism share			output	tourism share	output	tourism share														
A. Specific products																														
A.1 Characteristic products (A)																														
1 – Accommodation services																														
1.1 – Hotels and other lodging services (3)	x	x														x		x		x		x		x		x		x		x
1.2 – Second homes services on own account of for free			x	x																										
2 – Food and beverage serving services (3)			x	x	x	x			x	x			x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x
3 – Passenger transport services (3)			x	x																										
3.1 Interurban railway (3)			x	x																										
3.2 Road (3)			x	x																										
3.3 Water (3)			x	x																										
3.4 Air (3)			x	x																										
3.5 Supporting services			x	x																										
3.6 Transport equipment rental			x	x																										
3.7 Maintenance and repair services			x	x																										
4 – Travel agency, tour operator and tourist guide services			x	x																										
4.1 Travel agency (1)			x	x																										
4.2 Tour operator (2)			x	x																										
4.3 Tourist information and tourist guide			x	x																										
5 – Cultural services (3)			x	x																										
5.1 Performing arts			x	x																										
5.2 Museum and other cultural services			x	x																										
6 – Recreation and other entertainment services (3)			x	x																										
6.1 Sports and recreational sport services			x	x																										
6.2 Other amusement and recreational services			x	x																										
7 – Miscellaneous tourism services			x	x																										
7.1 Financial and insurance services			x	x																										
7.2 Other good rental services			x	x																										
7.3 Other tourism services			x	x																										
A.2 Connected products			x	x																										
distribution margins			x	x																										
B. Non specific products			x	x																										
distribution margins			x	x																										
services			x	x																										
Value of domestically produced goods net of distribution margins	x	x	x	x	x	x			x	x			x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x
Value of imported goods net of distribution margins			x	x																										
TOTAL output (at basic prices)																														
1 Agriculture, forestry and fishery products																			x	x	x	x	x	x	x					
2 Ores and minerals																			x	x	x	x	x	x	x					
3 Electricity, gas and water																			x	x	x	x	x	x	x					
4 Manufacturing																			x	x	x	x	x	x	x					
5 Construction work and construction																			x	x	x	x	x	x	x					
6 Trade services, restaurants and hotel services																			x	x	x	x	x	x	x					
7 Transport, storage and communication services																			x	x	x	x	x	x	x					
8 Business services																			x	x	x	x	x	x	x					
9 Community, social and personal services																			x	x	x	x	x	x	x					
Total intermediate consumption (at purchasers price)																														
Total gross value added of activities (at basic prices)																														
Compensation of employees																														
Other taxes less subsidies on production																														
Gross Mixed income																														
Gross Operating surplus																														

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Table A3.7
Employment in the tourism industry, Table 7

Tourism industries	Number of establishments	Number of Jobs total			Status in employment employees			Status in employment other			Number of employed persons total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
1 – Hotels and similar		X	X	X	X	X	X	X	X	X	X	X	X
2 – Second home ownership (imputed)													
3 – Restaurants and similar													
4 – Railways passenger transport													
5 – Road passenger transport													
6 – Water passenger transport													
7 – Air passenger transport													
8 – Passenger transport supporting services													
9 – Passenger transport equipment rental													
10 – Travel agencies and similar													
11 – Cultural services													
12 – Sporting and other recreational services													
TOTAL													

Table A3.8
Tourism gross fixed capital formation of toerism industries and other industries, Table 8

Capital goods	TOURISM INDUSTRIES												Total Tourism Industries	Other industries			Total tourism gross fixed capital formation of tourism industries and others
	1 - Hotels and similar	2 - Second home ownership (imputed)	3 - Restaurants and similar	4 - Railway passenger transport	5 - Road passenger transport	6 - Water passenger transport	7 - Air passenger transport	8 - Passenger transport supporting services	9 - Passenger transport equipment rental	10 - Travel agencies and similar	11 - Cultural services	12 - Sporting and other recreational services		Public Administration	Others	Total	
A. Produced non-financial assets																	
A1. Tangible fixed assets																	
1. Tourism accommodation																	
1.1. Hotel and other collective accommodation		X															
1.2. Dwellings for tourism purposes																	
2. Other buildings and structures		X															
2.1. Restaurants and similar buildings		X															
2.2. Construction or infrastructure for passenger transport by road, rail, water, air		X												(1)			
2.3. Buildings for cultural services and similar		X															
2.4. Constructions for sport, recreation and entertainment		X												(1)	(1)		
2.5. Other constructions and structures		X															
3. Passenger transport equipment		X															
3.1. Road and rail		X															
3.2. Water		X															
3.3. Air		X															
4. Machinery and equipement		X												(1)	(1)		
A2. Intangible fixed assets		X												(1)	(1)		
B. Improvement of land used for tourism purposes																	
TOTAL																	

Memo:

C. Non produced non-financial assets		X	
1. Tangible non produced assets		X	
2. Intangible non produced assets		X	
TOTAL			

(1) Only that which is for tourism purposes.

Table A3.9
Tourism collective consumption, by functions and levels of government, Table 9

Function	National level (9.1)	Regional (state) level (9.2)	Local level (9.3)	Total tourism collective consumption (9.4)= (9.1)+(9.2)+(9.3)	Memo (*) Intermediate consumption by the tourism industries
Tourism promotion					
General planning and coordination related to tourism affairs					x
Generation of statistics and of basic information on tourism					x
Administration of information bureaus					
Control and regulation of establishments in contact with visitors					x
Specific control to resident and non resident visitors					x
Special civil defence services related with the protection of visitors					
Other services					
TOTAL					

* This column reflects the expenditure by the tourism industries in tourism promotion or other services related to the functions described, when relevant.

Table A3.10
Non-monetary indicators, Table 10

a. Number of trips and overnights by type of tourism and categories of visitors

	Inbound tourism (*)			Domestic tourism			Outbound tourism		
	Same-day visitors	Tourists	Total visitors	Same-day visitors	Tourists	Total visitors	Same-day visitors	Tourists	Total visitors
Number of trips (*)									
Number of overnights									

(*) In the case of inbound tourism, the variable would be "arrivals"

c. Number of establishments and capacity by forms of accommodation

	Collective tourism establishments		Private tourism accommodation	
	Hotels and similar	Others	Second homes	Others
number of establishments				
capacity (rooms)				
capacity (beds)				
capacity utilization (rooms)				
capacity utilization (beds)				

b. Inbound tourism: Number of arrivals and overnights by means of transport

	Number of arrivals	Number of overnights
1. Air		
1.1 Scheduled flights		
1.2 Non scheduled flights		
1.3 Other services		
2. Waterway		
2.1 Passenger lines and ferries		
2.2 Cruise		
2.3 Other		
3. Land		
3.1 Railway		
3.2 Motor coach or bus and other public road transportation		
3.3 Private vehicles		
3.4 Vehicle rental		
3.5 Other means of land transport		
TOTAL		

d. Number of establishments in tourism characteristic and tourism connected activities classified according to number of employed persons

	1-4	5-9	10-19	20-49	50-99	100-249	250-499	500-999	>1000	TOTAL
Tourism Characteristic activities										
1 – Hotels and similar										
2 – Second home ownership (imputed)	x	x	x	x	x	x	x	x	x	x
3 – Restaurants and similar										
4 – Railways passenger transport										
5 – Road passenger transport										
6 – Water passenger transport										
7 – Air passenger transport										
8 – Passenger transport supporting services										
9 – Passenger transport equipment rental										
10 – Travel agencies and similar										
11 – Cultural services										
12 – Sporting and other recreational services										
Tourism Connected activities										
TOTAL										

4. *Tourism Satellite Accounts of the Netherlands and Aruba*

4.1 *Introduction*

In the previous chapter the main concepts and definitions of the TSA have been discussed, and the set of ten tables, which forms the present TSA framework, has been presented. As I have mentioned, in several countries the first six tables of the TSA framework have been put into practice. These tables address tourism production, tourism consumption and the confrontation of tourism production and consumption. As mentioned earlier, they are the core tables of the TSA.

In the introduction to this study, I briefly introduced the Netherlands and the tropical Caribbean island state Aruba, two very different countries with respect to tourism. I also mentioned that for these two countries the tables that form the core of the TSA framework have recently been built. That is, for those two countries we now have tables 1–6 of the TSA framework. Therefore we now have tables of the supply of goods and services to visitors, and the consumption of these goods and services by visitors as recommended by TSA: RMF.

Statistics Netherlands is the main compiler of macroeconomic statistics – including the national accounts – in the Netherlands. At the European level, Eurostat, the European Statistical Agency, is responsible for promoting the production of a set of well-specified statistics. One of Eurostat's recent efforts concerned the production of tourism statistics by member states (Eurostat, 2001a; 2001b). In line with this, Statistics Netherlands started in 2003 with a feasibility study for the development of a TSA (De Boer et al., 2004). Hereafter, the TSA has been taken into production with a first set of tables and figures for the Netherlands for the year 2002 (Hoekstra et al., 2006). This first set of tables was published on an experimental basis in anticipation of a time series. The set consisted of the core tables of the TSA. Expenditure information is attributed to different kinds of visitor categories, like domestic, outbound and inbound visitors, to recreational and business travel, and to consumer durables and social transfers in kind. Tourism consumption is confronted with the supply to visitors offered by the relevant industries, resulting in the measurement of tourism value added. The Dutch TSA also includes a table on tourism employment.

Detailed value added information on inbound tourism in Aruba was first published in 2005 by the Central Bureau of Statistics of Aruba (Van de Steeg, 2005a). This publication provides a quantitative description of inbound tourism in Aruba comprising the supply of goods and services consumed by visitors from abroad for

1999. In this study inbound tourism and domestic tourism has been estimated for Aruba. As may be expected, within the TSA of Aruba the definition of the term 'usual environment' encounters certain conceptual problems. (As mentioned, this concept is central in establishing the size of domestic tourism, see also section 3.3 of this study).

The Netherlands and Aruba are each located on opposite sides of the tourism spectrum. The geography is radically different: a small island as opposed to a much larger country on the European mainland. Also the economic orientation of the two countries, a tourism-dependent economy in contrast to a highly diversified economy, is totally different. However, by confronting these two extremes in this chapter, we hope to provide a relevant platform to discuss the many issues involved in the compilation of a TSA. I shall show that the TSA concepts and guidelines should be (and are!) interpreted in such a way as best to suit the country they apply to. The Dutch TSA will be addressed first, after which the Aruba TSA is presented.

A final introductory note: for the exposition below, I have adopted a fair degree of detail. In this way, I hope that the numerous options that existed, and the many choices that successively have been made, will become clear. An example here is the problem, mentioned earlier, of giving the concept of "the usual environment" an appropriate meaning (see especially section 4.3.3. on the choices involved in the case of Aruba). The adopted level of detail also will provide a basis for the later discussion of the lack of interaction with major economic variables that characterizes the system as it now stands.

4.2   *The Dutch TSA*

The Dutch Tourism Satellite Account consists of several tables on tourism consumption, tourism supply and tourism employment for the year 2002. For the Netherlands expenditure information is attributed to different kinds of visitor categories, consumer durables and social transfers in kind, as distinguished in the TSA. In this section the compilation of the Dutch TSA will be described, but first I will present the different data sources which have been used in the compilation process.

4.2.1   *Data sources for the Dutch TSA*
The national accounts are an important data source for the Dutch TSA, which determines what can be called the "borders" of the TSA. The TSA distinguishes inbound, outbound and domestic tourism on daytrips and overnight stays with a recreational motive and business travel, consumer durables and social transfers in kind. Different kinds of surveys are available to supply detailed data on each of these types of tourism expenditure. A survey on daytrips[1] is undertaken once every 5 to 6 years and is aimed at collecting information on the kind of activity,

destination and expenditure of daytrips of Dutch persons. The 'continual holiday survey'[2] takes place every quarter of a year and is aimed at gathering data on activities and expenditure of Dutch people on vacation or on business trips in the Netherlands or abroad. A mobility survey[3] is aimed at collecting information on all aspects of mobility of the Dutch population, ranging from the mode of transportation and time of departure to destination and motive of travel. A sample of accommodations and lodgings are asked for information on the number of visitors and overnight stays of Dutch and foreign visitors. The survey 'accommodations and lodgings'[4] takes place on an annual basis. Finally, the survey 'inbound tourism'[5] is undertaken once in every 5 years. This survey includes information on motive and characteristics of the visit, country of origin of the visitor, mode of transportation and expenditures per category.

To facilitate the integration process in specific areas, separate modules have been developed. In these modules different kinds of data are grouped together and analysed, after which the information is returned to the main framework. The ratios and other different computations need to have a plausible value before the integration process is completed.

4.2.2 *The Dutch national accounts*

In 2008 the 65th birthday of the Dutch national accounts was celebrated at Statistics Netherlands[6]. In the long history of the Dutch accounts different developments can be noticed such as the growing interest in satellite accounts in the area of the environment (De Haan et al., 1994). The Dutch core framework nowadays consists of annual supply and use tables, institutional sector accounts and labour accounts[7]. Including the labour accounts in the integration process of the supply and use tables and institutional sector accounts definitely improves the quality of the national accounts results. Due to the long time national accounts have been compiled, a large historical data set is available of the national accounts of the Netherlands. Besides presenting the national accounts by industry, product or sector the Dutch national accounts are also produced for each region. The regional accounts consist of national accounts aggregates per region.

With an eye on more recent developments in the national accounts, Statistics Netherlands compiles the supply and use tables on a quarterly basis. The first estimates become available 90 days after the reference quarter. This includes the major macroeconomic indicators such as national income, consumption and investment. Recently, the institutional sector accounts were also constructed and published on a quarterly basis. Information, such as saving and financial balance sheets are now available 90 days after the reference quarter.

An input-output table for the Netherlands also is part of the regular publications of the national accounts. The input-output table is derived from, among other things,

the supply and use tables and is of the industry by industry type (see chapter 8 for a more extensive discussion).

A number of modules are included in the annual national accounts publication of Statistics Netherlands. The SAM, environmental accounts and TSA (now) are part of the regular compilation cycle of the Dutch National acounts. Statistics Netherlands has, e.g., a long history in the area of environmental accounting. Since its pioneering work in the early 1990s, it has gradually extended the system of environmental accounts. In 1993, the first NAMEA became available (De Haan et al., 1994), which largely follows the initial design format (see, for example, De Haan and Keuning, 1996). In subsequent work the scope of the NAMEA has been expanded substantially to other environmental domains such as water and waste.

We have seen previously (see chapter 2) that the most important recipient of NA data is Eurostat. Eurostat calculates the aggregates for the EU and the EMU (the Economic and Monetary Union). The distribution of the GDP over regions i.e. part of the country, which can be traced from the regional accounts, partly determines the level of the contribution which a member state will receive from the European structural funds. That is, the net position of the Netherlands in relation tot the EU will to a large extent be determined by national accounts data. Also the VAT-contribution and the GNI-contribution of the Netherlands to the EU are based on the national accounts. Thus, the net position of the Netherlands in relation tot the EU will to a large extent be determined by national accounts data.

Because of the increasing importance of the GNI (Gross National Income), all European members must apply the same definitions for the statistical concepts. This is why a substantial number of agreements have been made for mutually comparable harmonised figures. Under the auspices of Eurostat a GNI management committee has been founded, having as its main task guarding the quality of the GNI estimates of the member states. The government debt and the government deficit as a percentage of GDP play an essential role for the entry to the EMU (Maastricht Treaty) and in the stability pact (Amsterdam Treaty). A fine due to the failure to comply with the obligations of the Treaty of Amsterdam, and possible mitigating circumstances (such as an economic depression) are related to the national accounts.

4.2.3   *The Dutch TSA estimates*

In the Dutch TSA, tourism consumption is divided into different categories of tourism, such as business or recreational tourism, daytrips or trips involving more days, and residence or non-residence. Earlier (see section 3.3) I have pointed out that each country may need its own set of interpretations of the basic concepts and definitions. For example, a person in the Dutch TSA is a visitor every time he or she makes a trip with a recreational or business motive and duration of more then 2 hours from home or work (including travel time).

In the first table of the Dutch TSA (table 4.1) characteristic and non-characteristic products are included in the rows. Domestic recreational consumption of visitors on daytrips forms the largest category, compared to the other tourism categories presented. Compared to domestic tourism's 16,895 million euro, inbound tourism consumption is relatively small, amounting to about 6,118 million euro. Most money is spent on meals and drinks with 8,625 million euro in 2002. The expenditures on services for trips abroad supplied by Dutch companies, like transport companies, travel companies and tour operators are included in separate columns.

Table 4.1 also includes information on purchases of consumer durables and expenditures of social transfers in kind. Caravans, camping equipment and sporting goods are counted among consumer durables. The total amount spent on consumer durables is about 2,700 million euro in 2002. Social transfers in kind amount to about 1,600 million euro and comprise mostly government subsidies. These expenditures consist of subsidies on museums but also tourism consumption expenditure of non-profit institutions serving households. As can be seen, table 4.1 includes aspects of tables 1, 2 and 4 of the recommended framework presented in the TSA: RMF.

Table 4.1
Internal tourism consumption in the Netherlands, 2002

	Internal tourism					
	Non residents				Residents	
	Inbound toerism				Domestic Toerism	
	Destination Netherlands				Destination Netherlands	
	Business		Recreational		Business	
	Same day	More days	Same day	More days	Same day	More days
	mln euro					
Characteristic services						
Accomodation services		354		620		392
Restaurants and bars	12	221	119	526	468	215
Passenger transport	7	272	39	796	303	15
Travel agencies				1	2	4
Cultural services		7	13	107	16	
Sports and other recreation			11	73	16	
Total characteristic services	19	854	182	2,123	805	626
Non characteristic goods and services	14	108	356	1,932	750	127
Total (excl. VAT)	33	960	538	4,055	1,555	753
VAT	4	65	73	390	–	–
Total (incl. VAT)	37	1,025	611	4,445	1,555	753

Source: Hoekstra et al., 2006.

[1] This concerns domestic consumption with respect to travelling abroad (destination abroad).

Table 4.2
Outbound tourism consumption in the Netherlands, 2002

	Outbound tourism			
	Residents, destination abroad			
	Business		Recreational	
	Same day	More days	Same day	More days
	mln euro			
Total outbound consumption (incl. VAT)	224	3,133	323	6,715

Source: Hoekstra et al., 2006.

In table 4.2 outbound tourism consumption is presented separately. Outbound tourism amounts to 10,400 million euro in 2002. It should be observed that the information in table 4.2 does not have a high level of detail because relatively little

| Recreational | | Destination abroad[1] | | | | Consumer durables | Social transfers in kind | Internal tourism consumption |
| | | Business | | Recreational | | | | |
Same day	More days	Same day	More days	Same day	More days			
	960							2,326
6,263	800							8,625
599	89	29	426	15	1,988		239	4,819
7	13	3	209	6	628			873
850	44						941	1,978
1,688	12						452	2,252
9,408	1,918	32	637	21	2,616		1,632	20,873
1,415	585	23	34	89	184	2,260		7,875
10,823	2,503	55	671	110	2,800	2,260	1,632	28,748
1,058	203	–	–	18	72	420	12	2,315
11,881	2,706	55	671	128	2,872	2,680	1,644	31,062

information is available on the distribution of the expenditures over the different product categories. As in most countries, more attention is paid to supplying information on domestic expenditures, compared to expenditures abroad.

The Dutch TSA is mainly constructed from the use or consumption side. After tourism consumption has been made consistent and integrated with total consumption and supply in the national accounts, the tourism supply table is constructed. Based on the supply table in the national accounts and expert opinion, tourism production is assigned to domestic producers and imports. In table 4.3 the supply of goods and services by different industries is presented. The characteristic industries and products are explicitly listed and the non-characteristic industries and products are presented on an aggregated level. Some extra columns are included for trade and transport margins, taxes less subsidies on products and for the imports for internal tourism consumption.

Value added is calculated by deducting intermediate consumption from the output for each industry. Intermediate consumption, and, therefore, tourism value added,

is estimated using the share of output related to tourism in total output. In 2002 tourism value added amounts to 13,498 million euro as presented in table 4.4. This is about 3.3 percent of total value added. Even though tourism is not an industry in the same way as agriculture, tourism contributes more to the Dutch economy than agriculture. All in all, tourism comprises 3.5 percent of GDP (Hoekstra et al., 2006).

The Dutch TSA includes a table on tourism employment as recommended in TSA: RMF. But the dimensions included in table 4.5 do not completely match that of the

Table 4.3
Tourism supply at basic prices in the Netherlands, 2002

	Hotels and other accom- mo- dation	Res- tau- rants and bars	Trans- port	Travel agen- cies etc.	Cul- tural institu- tions	Other recre- ational organi- sations	Other busi- nesses	Imports for in- ternal tou- rism con- sum- ption	Taxes on pro- ducts and sub- sidies	Trade and trans- port mar- gins	Total
	mln euro										
Accomodation services	2,234	47	0	0	0	0	45		0		2,326
Restaurants and bars	1,076	6,993	3	0	127	412	14		0		8,625
Passenger transport	0	0	5,246	0	0	0	348		-775		4,819
Travel agencies			6	857	0	0	10		0		873
Cultural services	9	47	1	0	1,914	0	14		-7		1,978
Sports and other recreation	40	79	0	0	0	2,023	106		4		2,252
Non characteristic goods and services	0	1	2	2	11	0	3,095	1,817	1,033	1,914	7,875
Production (basic prices)	3,359	7,166	5,256	857	2,041	2,435	537	0	-778	0	20,873

Source: Hoekstra et al., 2006.

Table 4.4
Tourism value added in the Netherlands, 2002

	Hotels and other accom- mo- dation	Res- tau- rants and bars	Tran- port	Travel agen- cies etc.	Cul- tural insti- tu- tions	Other recre- ational organi- sations	Other busin- esses	Total tou- rism value added	Other value added	Total
	mln euro									
Value added	1,856	3,485	3,228	590	862	1,115	2,362	13,498	400,876	414,374

Source: Hoekstra et al., 2006.

Table 4.5
Tourism employment in the Netherlands, 2002

	Hotels and other accom- moda- tion	Res- taur- ants and bars	Trans- port	Travel agen- cies etc.	Cul- tural insti- tu- tions	Other recre- ational orga- nisa- tions	Other busi- nes- ses	Total	Other employ- ment	Total
Jobs (x 1,000)	51	174	60	26	33	35	60	439	8,412	8,851
Total employment (1,000 persons)	47	154	58	25	27	27	57	395	7,929	8,324
Employment (1,000 fte)	30	66	48	19	14	17	37	231	6,389	6,620

Source: Hoekstra et al., 2006.

recommended table. The number of establishments, for instance, is not included in the table and neither is the employment status. For 2002 the number of tourism jobs is estimated at 439 thousand or 5 percent of the total number of jobs in the Netherlands. The number of active persons in tourism totals 395 thousand or 4.7 percent of the total number of active persons in the Netherlands. Measured in full time labour equivalents, tourism covers 3.5 percent of the total full time equivalents in the Netherlands or 231 thousand full time job equivalent. These results show that in 2002 relatively more persons working part-time are employed in tourism compared to the rest of the economy (Hoekstra et al., 2006).

 Not all persons working in a restaurant are included in the total number of active persons in tourism. It depends on the share of the tourism consumption supplied to visitors by the restaurant, which part of the employees are included in the total number of active persons in tourism. The number of jobs, active persons and full time equivalents are calculated using the share of tourism consumption and total consumption. Tourism employment is largest in the industry of restaurants and bars. These are mostly part time workers, as the share in the number of active persons is smaller than the total number of employed persons in tourism (Hoekstra et al., 2006).

Tourism is based on the characteristics of the consumer, i.e. whether or not a person is a visitor. Statistics on employment in tourism, tourism supply and tourism value added are all related to the share of tourism consumption in total consumption and are estimated for each industry. The nominal amounts of tourism consumption and full time employment equivalent seem considerable. However, relatively speaking, tourism in 2002 in the Netherlands contributes about 3.3 percent of value added in the economy and 3.5 percent of total full time equivalent. The question is: do these numbers warrant the effort for the construction of a full TSA for the Netherlands for each year? The answer to this question depends on the goals policy makers have and on budget restrains at the statistical end of the equation.

4.3 The Aruba TSA

The closing of Exxon's Lago refinery in March 1985 was a turning point in Aruba's economic development. With an estimated share of 3.3 percent in direct employment and 20 percent of the total wage bill of the island, the impact of the closing of the refinery on the Aruba economy was considerable (Instituut voor toegepast economisch onderzoek (ITEO), 1985). The resulting large-scale unemployment in Aruba led the Aruba government to shift its focus from oil refining to tourism. The pearly-white beaches, clear blue sea, 360 days of sunshine and relaxing atmosphere promised to be the ideal ingredients for a success story.

Before Aruba was separated from the Dutch Antilles, one set of national accounts existed for all six islands combined. The implementation of the System of National Accounts in Aruba started in 1996. At first the whole system of economic statistics had to be put in place, before the compilation of the supply and use tables and the institutional sector accounts could start. Currently, the System of National Accounts (SNA) of Aruba is being developed further (Central Bureau of Statistics of Aruba, 2003b).

I have constructed a Tourism Satellite Account for Aruba for the year 1999. Expenditure information is attributed to inbound and domestic tourism (see table 4.6) which are distinguished in the Aruba TSA. Information on tourism consumption has been matched with domestic supply and imports. In this section the compilation of the Aruba TSA is described, starting with the different data sources which have been used in the compilation of the tables.

4.3.1 Data sources for the Aruba TSA

Tourism consumption in Aruba is estimated by employing tourism specific surveys and information provided in the national accounts and its data sources. The consumption of visitors from abroad in Aruba is estimated by using the results of a cruise visitor survey[8] and a tourism expenditure survey (TES)[9]. The cruise visitor survey is conducted every 5 years. In the years between, the results are adjusted for the number of cruise visitors. The tourism expenditure survey is aimed at stay-over visitors, and also for this survey results are adjusted to obtain the complete expenditure using the number of stay-over visitors and average number of nights stayed. Both surveys aim at inbound visitors.

On the supply side, the output of establishments related to inbound tourism is estimated using preliminary data from the Business Count 2003. The Business Count 2003 is a census of all active establishments in Aruba, and was conducted by the Central Bureau of Statistics in October 2003. The Business Count 2003 includes a question on the percentage of revenue the establishment gained from conducting business with non-resident companies or persons[10]. For the estimation of the

supply to inbound visitors, only persons are relevant. The business that Aruba enterprises engage in with non-resident companies, such as the import of alcoholic beverages and the purchase of accounting services from a non-resident accounting firm, have nothing to do with tourism. If foreign visitors buy a bottle of whiskey in an Aruba store, then this is included in inbound tourism and constitutes business with a non-resident person. Revenue is defined here as the turnover generated from sales of goods or services. These percentages of the revenue are used to estimate the average share of turnover related to inbound tourism for each industry. These shares are multiplied with the value of the produced output of the respective industries. This constitutes a preliminary estimate of tourism production; the products are classified using the Central Product Classification (CPC; UNSD, 1997), whereas the establishments are classified by their economic activity using the International Standard Industrial Classification of All Economic Activities, Third Revision (ISIC Rev. 3; UNSD, 1989).

The confrontation of data on the supply of goods and services with data on the use of goods and services determines the final estimate of domestic and inbound tourism consumption for Aruba. Total domestic supply per industry is matched to tourism export, i.e. total inbound tourism consumption product by product for each row. The value of goods consumed by inbound visitors is taken net of retail trade services and, therefore, is the value of the retail trade services subtracted from the goods consumed.

For the estimation of outbound tourism consumption, the household budget survey is used. This survey is undertaken about every 5 years and households are asked to keep a diary of their expenditures.

4.3.2 The national accounts of Aruba

The Aruba national acounts consist of supply and use tables and its institutional sector accounts. They are published by the Central Bureau of Statistics of Aruba (CBS of Aruba) on a regular basis. The supply and use tables for 1999 already have been used for a number of analytical purposes (see tables A4.2 and A4.3 in appendix 4.1; CBS of Aruba, 2003b). In this section I will address them in some more detail; see also section 8.4 for an alternative representation.

The supply table gives the information about the resources in terms of goods and services. In the rows, the outputs of the various types of products are presented according to CPC (Central Product Classification) and two adjustment items, one for the c.i.f. / f.o.b.[11] adjustment (on imports) and one for direct purchases abroad by residents (expenditures abroad). The columns of the supply table present the output[12] of industries which are classified by ISIC (International Standard Industry Classification),[13] again the imports of goods and services, and three adjustment items, i.e., the c.i.f. / f.o.b. adjustment on imports, the trade and transport margins, and taxes less subsidies on products.

The United Nations maintains the abovementioned product (CPC) and industry (ISIC) classifications. Both classifications have a certain logic to them. They both are hierarchical, which is expressed in more detail with the increase of digits. For example, 'I' stands for 'transport, storage and communication' while 60 stands for 'land transport' and 61 for 'water transport'. The order of the products and industries is also not arbitrary. ISIC starts with the primary industries, among others, agriculture, hunting and mining, then the secondary industries, such as manufacturing, and concluding with services industries. The products belonging to the primary industries, such as agricultural products, are listed first, then manufacturing products and services. In case of the supply table, outputs in this table are generally located on the diagonal.

In the Aruba supply and use tables the following industries are distinguished (see also table A4.1 in appendix 4.1):

1. *Agriculture, hunting, forestry, fishing, mining and quarrying;*
2. *Manufacturing;*
3. *Electricity, gas and water supply, manufacture of refined petroleum products;*
4. *Construction;*
5. *Wholesale and retail trade, repair of motor vehicles and household goods;*
6. *Hotels;*
7. *Restaurants;*
8. *Transport, storage and communications;*
9. *Financial intermediation;*
10. *Real estate activities;*
11. *Other business activities;*
12. *Public administration, compulsory social security, education;*
13. *Health and social work;*
14. *Other community, social and personal service activities.*

Data on most industries are published in the first digit, the highest level of aggregation. Hotels and restaurants are presented in the third digit level of the classification and real estate in the second digit level. These industries are presented with a high level of detail. The one digit level industries agriculture, hunting, forestry, fishing, mining and quarrying have been put together to form one publishable industry. The major reason for the choice of aggregation level for the publication of the tables is, first, reliability of the information. Certain industries are not well covered in the collection of data and therefore the data is found to be insufficiently reliable at certain detailed levels of aggregation. Examples of this are the industries mentioned above, i.e. agriculture, hunting, forestry, fishing and mining and quarrying. For these industries, the only option is forming a combination with neighbouring categories. Secondly, information on individual companies is not allowed to be visible in published tables. For instance, the size (and some other characteristics) of the refinery in Aruba is

such that, if published with the other manufacturing industries, accurate information on the refinery can be extracted from the published tables. Statistical agencies generally have specific conventions concerning the publication of statistical information. For example, one enterprise should not comprise more then 70 percent of any statistic, i.e. one cell in the supply and use tables. (An exception to this rule is information for which specific permission for publication has been given by the respective enterprise or organisation). For the classification of industries and products Aruba follows United Nations guidelines, using ISIC and CPC.

The following products are distinguished in the Aruba supply and use tables:

1. *Agriculture, forestry and fishery products;*
2. *Ores and minerals; electricity, gas and water;*
3. *Food products, beverages and tobacco; textiles, apparel and leather products;*
4. *Other transportable goods, except metal products, machinery and equipment;*
5. *Metal products, machinery and equipment;*
6. *Constructions and construction services; intangible assets;*
7. *Trade services;*
8. *Lodging; food and beverage serving services;*
9. *Transport and storage services;*
10. *Financial intermediation, insurance and auxiliary services;*
11. *Real estate services;*
12. *Leasing or rental services without operator;*
13. *Business and production services;*
14. *Public administration, compulsory social security services and education services;*
15. *Health and social services;*
16. *Recreational, sporting and other social and personal services.*

As already mentioned, these goods and services are classified using the CPC (Central Product Classification). The products are presented on the same kind of level as the previously mentioned industries. In many cases the basic data does not include a specification on the kind of products produced by the enterprise. The type of enterprise is used in these cases to determine which products are supplied by the enterprise. This is also the case for lodging and food and beverage serving services. The basic data does not contain information on lodging and food and beverage services separately. Most hotels supply both lodging and meal and drink services. Their revenue usually is not specific enough to make a distinction between the two.

The goods and services produced in the economy are measured at basic prices. The *basic price* is the amount received by the producer from the purchaser for a unit of a good or service produced as output minus any tax payable, and plus any subsidy receivable, on that unit following its production or sale. Any transport charges invoiced separately by the producer are excluded (SNA93, par. 6.205).

In the supply table, total imports are valued at f.o.b. (free on board) prices. However, data on detailed flows of imports from basic data sources are usually valued at c.i.f. (cost insurance freight) prices. The f.o.b. price can be considered as the purchaser's price [14] paid by an importer taking delivery of the goods after it has been loaded on to his own carrier (or some other carrier), at the exporter's frontier, after payment of any export taxes or the receipt of any tax rebates. A global c.i.f. / f.o.b. adjustment on imports is added in order to reconcile the different valuation used for total imports. The c.i.f. / f.o.b. adjustment is estimated to be approximately ten percent of imports at c.i.f. price [15]. In the supply table, the transportation services and insurance services on imports rendered by residents and non-residents are estimated respectively 159.16 and 28.09 million Aruba florin. These amounts (with a negative sign) correct the transportation services and insurance services mentioned (185.56 and 51.84 million Aruba florin respectively) in the import column for the included transportation services and insurance services on imports rendered by non-residents. The total amount of the adjustment (187.25 million Aruba florin) is booked twice so total imports of goods are no longer valued at c.i.f. but at f.o.b. The customs department is the supplier of foreign trade statistics such as data on imports of goods. The balance of payments compiled by the Central Bank of Aruba is used for estimating the imports of services.

Trade margins are mainly produced by the wholesale and retail trade activities. The trade margins are distributed in the supply table over the goods produced in the economy and deducted from the trade services. In this way total of the column 'trade and transport margins' is zero. In the use table the trade margins are part of the purchase price and therefore included in intermediate consumption and final demand categories. For the calculation of the trade margin per product, the average trade margin rates and the intermediate consumption and final use categories are taken into account. At the Central Bureau of Statistics of Aruba only trade margins have been estimated. Transport margins, and therefore the costs of transport, are assumed to be already included. On the small island of Aruba the transportation costs can be assumed to be marginal.

Taxes on products are taxes that are payable per unit of some product when it is produced, delivered, sold, transferred or otherwise disposed of by its producer. This is also the case, *vice versa*, for subsidies on products. Subsidies on products can be considered as negative taxes on products. Taxes less subsidies on products are elements between purchaser values and basic values, they are part of government finances [16]. In certain cases subsidies are higher then taxes and a negative amount results.

The use table provides information on the uses of goods and services, and also on the cost structures of the industries. The various types of products (classified by CPC) and the adjustment item 'expenditures abroad', i.e. the direct purchases

abroad by residents, are presented in the rows. Intermediate consumption of industries, exports of goods and services, final consumption expenditure and gross capital formation are placed in the columns. In the use table the value added of each industry is visible. Value added is split in other taxes less other subsidies on production, compensation of employees and operating surplus/mixed income gross [17].

Intermediate consumption consists of the value of the goods and services which are used up in the production process, excluding fixed assets. The intermediate consumption is valued at the purchasers' prices. Intermediate consumption is estimated as the purchases of goods and services of the industries, excluding fixed assets.

Exports of goods and services consist of purchases, barter, or receipts of gifts or grants, of goods and services by non-residents from residents. Data on exports of goods are based on customs information and are classified by CPC. Adjustments are made for products that are not included in the customs information such as parcel post, mineral products, repair on goods, and goods used by the Dutch marines. Information on services is obtained from the balance of payments, which is compiled by the Central Bank of Aruba. Tourism expenditures [18] are excluded and a refining fee is calculated for the refinery.

Final consumption expenditure consists of the expenditure, including imputed expenditure (such as housing services for owner occupied houses), incurred by resident households, resident non-profit institutions serving households and general government on consumption goods and services. The final consumption expenditures are split into household final consumption expenditure and government final consumption expenditure. Household final consumption expenditure is mainly based on the Income and Expenditure survey 1998 [19].

The government final consumption expenditure consists of the purchases of goods and services bought for redistribution and non-market output. The annual reports of the government are the sources of information for the estimation of the government final consumption expenditure. The annual reports of non-profit institutions serving households are the sources of information for the estimation of the final consumption expenditure incurred by non-profit institutions serving households.

Gross capital formation is measured by the total value of gross fixed capital formation, changes in inventories and acquisitions less disposals of valuables. Gross fixed capital formation is equal to the total value of producer's acquisitions, less disposals, of fixed assets plus certain additions to the value of non-produced assets realized by the productive activity of institutional units.

The investment schedules in the annual reports of the government are analysed and linked to SNA concepts and classifications in order to estimate the public gross fixed capital formation. The computation of private gross fixed capital formation in machinery and equipment is based on the Foreign Trade Statistics as the majority of machinery and equipment is imported. The estimation of private gross fixed capital formation in dwellings, buildings and other structures is based on information with regard to constructed area (square meters) and average construction price per square meter.

The changes in inventories are estimated endogenously. The changes in inventories of the free zone are estimated as the free zone imports plus wholesale margins on the free zone goods minus the free zone exports. The changes in inventories of the rest of the economy are estimated using the following information: the total supply of goods minus the free zone supply of goods and a ratio of stock to sales.

The annual reports of the government are used to calculate the public gross fixed capital formation. The estimation of the private gross fixed capital formation is based on the Foreign Trade Statistics, the data of the Department of Technical Inspections on electrical approvals, the data from the Insurance Association Aruba on the average construction price of dwellings and a survey on the construction of other buildings and structures.

Taxes (subsidies) on production consist of all taxes (subsidies) except taxes (subsidies) on products that enterprises incur (receive) as a result of engaging in production.

The other taxes minus subsidies on production are derived from the government accounts. Depending on the type of tax, amounts are allocated to specific industries or allocated proportional to the industries by using the ratio of compensation of employees of one industry to the total compensation of employees.

The government annual reports provide information on taxes less subsidies on production.

Compensation of employees is defined as the total remuneration, in cash or kind, payable by an enterprise to an employee, in return for work done by the latter during the accounting period. The components of compensation of employees over which taxes are levied are included in the summary wage statements. Adjustments are made for those components that are not included. These adjustments are based on a comparison between the summary wage statements and business financial statements.

Operating surplus/mixed income is a measure of the surplus accruing from the production process before deducting any explicit or implicit interest charges, rents

or other property incomes payable on the financial assets, land or other tangible non-produced assets required to carry on the production.

4.3.3 Aruba TSA estimates

As we have seen, the core of the Aruba TSA for 1999 consists of the data on domestic tourism, outbound tourism and inbound tourism. In section 3.3 it has been determined, for the estimation of domestic tourism in Aruba, that the usual environment includes the expenditures in establishments of certain industries. These are the following industries: hotels, timeshare resorts, apartments and villa's, bars, full service restaurants, nightclubs and dinner theaters, scheduled air transport, other supporting transport activities, sporting activities and relates services; also sport fishing and hunting, casino activities, water sport activities and other recreational activities [20]. These establishments mainly produce hotel and other lodging services, food serving services; beverage serving services for consumption on the premises, air transport services, supporting and auxiliary transport services, real estate services for timeshare sales, gambling and betting services and other recreational, cultural and sporting services.

Total domestic tourism consumption amounts to 129.98 million Afl (Aruba florin). Domestic tourism consumption is distributed over product categories, which can be seen in table 4.6. Domestic tourism expenditure does not specifically include domestic business travel. In case domestic business travel takes place in the selected establishments, their consumption is included in domestic tourism.

Table 4.6
Inbound and domestic tourism in Aruba by products, 1999

	Inbound tourism consumption	Domestic tourism consumption	Total internal tourism consumption
	mln Afl		
Characteristic services			
Hotel and other lodging services	343.89	3.96	347.85
Food serving services; beverage serving services for consumption on the premises	247.38	37.10	284.48
Land transport services	30.55		30.55
Air transport services	70.01	62.75	132.76
Supporting and auxiliary transport services	25.58	2.58	28.16
Leasing or rental services without operator	42.10		42.10
Support services	2.47		2.47
Gambling and betting services	157.97	17.48	175.45
Other recreational, cultural and sporting services	51.16	6.11	57.27
Retail trade services	81.97		81.97
Total characteristic services	1,053.08	129.98	1,183.06
Non characteristic goods and services			
Telecommunications services; information retrieval and supply	10.07		10.07
Other professional, scientific and technical services	2.36		2.36
Non specific goods and services	226.88		226.88
Total	1,292.39	129.98	1,422.37

Source: Van de Steeg, 2005a.

The air transport services and supporting and auxiliary transport services included in domestic tourism refer to expenditures for trips abroad bought at Aruba companies. In contrast with the Dutch TSA, there is no differentiation between business and recreational tourism, and same day and more day tourism in the domestic tourism consumption estimate.

The expenditures of Aruba households going abroad amount to 98.02 million Aruba florin (Afl)[21]. Unfortunately, there is no detailed information available on the composition of outbound tourism consumption, not by product or visitor categories. Trips abroad generally include plane tickets, which are relatively expensive. For this reason it is assumed that the majority of trips made abroad by Aruba residents are for more than one day.

Total inbound tourism consumption is estimated at Afl. 1292.39 million. This does not included the purchase of timeshares. The purchase of timeshares is registered in the TSA and SNA93 as an investment or gross fixed capital formation[22]. The supply table (table A4.4 in appendix 4.1) contains the amount associated with timeshare sales under 'Real estate services for timeshare sales'. This is the output for the producing activity and part of gross fixed capital formation for the buying party. The total of timeshare sales amounts to Afl. 83.68 million. Inbound tourism has purchased about Afl.82.02 million in timeshare (Van de Steeg, 2005a).

In a previous publication of the national accounts of Aruba by of the Central Bureau of Statistics Aruba (2003b) the output of the combined industry 'hotels' presented in the supply table (see appendix 4.1 table A4.2) is lower compared to the total supply of the activities hotels, timeshare resorts and apartments and villa's in table A4.4 (Afl. 490.52 million compared to Afl. 558.48 million). Output associated with the sale of timeshares was not correctly calculated and included in the 'hotels' industry in the national accounts publication (Central Bureau of Statistics Aruba, 2003b).

In table A4.4 (see appendix 4.1) total tourism supply is presented. The confrontation of the supply of goods and services with the consumption for goods and services determines the final estimate of domestic and inbound tourism consumption. Total domestic supply is matched with domestic tourism consumption for certain products only and inbound tourism consumption product by product for each row.

Calculations for inbound tourism supply, presented in Van de Steeg (2005a), are adjusted to also include domestic tourism supply. Total intermediate consumption or uses at purchasers' prices for each activity is shown so the contribution of each activity in total value added can be calculated. Value added is the difference between total output and total inputs or intermediate consumption for each activity. Total value added for inbound tourism amounts to Afl. 565.70 million (18.3 percent of GDP) (Van de Steeg, 2005b; Van de Steeg and Steenge, 2006).

Compensation of employees is paid for by the production of tourism supply and totals Afl. 391.48 million (22 percent of total compensation of employees). Information on the total number of persons working in the different industries has not been matched with TSA definitions.

Taxes less subsidies on products and other taxes less other subsidies on production constitute room tax, casino tax and other taxes payable to general government. Room tax [23] is a percentage added to the hotel bill and payable by the hotel guests. Total room tax comes to Afl. 19.51 million in 1999.

Taxi drivers in Aruba operate mostly as own account workers. Their output is estimated using the tourism expenditure survey data and average incomes. Own account workers do not receive compensation of employees but mixed income, which explains why compensation of employees is very low for the activity 'taxis and busses'.

Air Aruba was Aruba's national airline until it went bankrupt in 2001, after sustaining heavy losses for many years. The 'scheduled air transport' activity consists by majority out of Air Aruba, which explains the negative value added of Afl. 34.88 million. Air Aruba's main activity was the transportation of passengers and freight in a lesser extent. The share of Air Aruba's output attributed to inbound tourism is calculated by the number of non-resident visitors flying with Air Aruba compared to the total number of passengers of Air Aruba. The expenditure of resident passengers of Air Aruba belong to the domestic part of outbound tourism.

Aruba's international airport is part of the 'other supporting transport' activities. Departure tax has to be paid by all passengers using the airport facilities. Cruise passengers also pay a tax to the ports authority for the use of the cruise terminal.

The activity 'retail trade' is considered a connected activity. This activity is not included in domestic tourism consumption. About 20 percent of 'retail trade services' is used by inbound tourism. The relatively large share might be explained by the relatively larger retail trade margins on luxury goods mostly bought by inbound visitors compared to retail trade margins on basic goods mostly bought by the residents. As recommended by the UNWTO the value of goods are taken net of retail trade services (WTO, 1999, p. 52). The value of the retail trade services is subtracted from the goods consumed.

About 52 percent of exports, and therefore foreign exchange earnings, 22 percent of compensation of employees and 21 percent of value added is associated with tourism. Domestic tourism only plays a minor role due to the limited possibilities for domestic tourism. Inbound tourism, on the other hand, plays a major role in the Aruba economy.

The core of the Aruba TSA consists of an estimation of domestic, inbound and outbound tourism consumption. Consumer durables and social transfers in kind have not specifically been included in the Aruba TSA. In general the impact of consumer durables on the Aruba economy is expected to be small as these products are not produced on Aruba. The estimation could not be made due to unavailability of data. Social transfers in kind are in certain cases included, as the production of non-profit institutions serving households, like sporting clubs. In these cases social transfers in kind are included in domestic or inbound tourism consumption, depending on who makes use of the services provided by non-profit institutions serving households.

Many different data sources were available for the construction of the Aruba TSA. Tourism in Aruba is big business. Policy makers, people in the tourism business but also the local population are convinced that tourism is the future for Aruba. About 18.3 percent of value added is earned with inbound tourism. Domestic tourism is very difficult to grasp for a small island as Aruba. The boundaries of domestic tourism are very hard to put in place in a rational way. The contributions of the refinery are not so large any more as they have been at the time of Largo. Tourism may be seen as the future of Aruba, but also seems to be Aruba's weakness. What will happen when the American economy goes into recession, taking into account that 65 percent of visitors to Aruba are from the United States? Policy makers are already taking in the risk of Cuba opening her borders and becoming Aruba's fearful competitor.

Before concluding this chapter, I will briefly mention some other estimates of the share of tourism in GDP. The World Travel & Tourism Council (WTTC) calculates 19.3 percent for 2002 and 21.5 percent for 1999 (WTTC, 2004). Calculations using a multiplier method arrive at 60 to 65 percent of tourism in GDP (Cole and Razak, 2004). This includes the indirect effect. In Steenge (1990b), a 'meta-study' on international competitiveness in the tourism sector, a number of estimates of the share of tourism in GDP for the year 1980 up to 1989 have been presented. These percentages range from 13 to 30 percent[24]. It seems that these estimates are at the top end, compared to the 18.3 percent of GDP presented in this chapter. The previously mentioned estimates are not based on a confrontation of data sources on the supply and use of goods and services for tourism.

The Aruba TSA has not been continued for more recent years. Due to changes in personnel the national accounts have not been published on a regular basis. For the moment efforts are made to start publishing more recent years of the supply and use tables and institutional sector accounts. The Central Bureau of Statistics of Aruba plans to compile a more recent TSA in the future.

4.4 General conclusions and remarks

Above I have discussed the structure of the Dutch and Aruba TSAs as they stand now, in some detail. This has been done to illustrate the many problems involved in interpreting the relevant concepts in "daily life". As we shall see, many of the issues I have discussed will reappear in the later chapters on, in my opinion, the required degree of interconnectivity in this type of statistics.

The Tourism Satellite Account of Aruba and the Netherlands include various aspects of the TSA methodology. Beside the many differences between the two presented TSA-s, some comparisons have been made. The Aruba economy, with approximately 18 percent of GDP, is highly dependent on inbound tourism. For the Dutch economy, however, tourism is only a marginal industry. It would be interesting to find out what this means for the future of Aruba if competition grows from other destinations such as Cuba.

A second conclusion is that domestic tourism is relatively more important for the Netherlands then for Aruba. Both countries pay relatively less attention to the measurement of outbound tourism. This kind of tourism does not contribute directly to a countries economy. However, expenditures of outbound tourism could be potentially bent back as domestic tourism.

The concept of the usual environment has been defined differently for each country due to each country's characteristics. The statistics on domestic tourism are therefore very difficult to compare for the two countries. In the Dutch TSA the measurement of consumer durables and social transfers in kind has been included, while it is excluded in the TSA of Aruba. The measurement and inclusion of business travel in the TSA framework has given and still gives rise to some international discussion. The Dutch TSA illustrates the methodological problems around measuring domestic business travel.

Besides the valuable information the two TSAs provide about the role of tourism in the two economies, these examples also illustrate that there are some parts of the TSA methodology which require further attention and thought. While the measurement of tourism consumption, production and value added has received much attention, there are other parts, such as tourism investment and tourism collective consumption which definitely should be addressed.

The tourism statistics presented in this chapter seem to "stand alone". They present a picture of the present situation and, when statistics over a number of years are available, a view on the past. However, what policy makers, decision takers and other stakeholders, such as people in the industry, are looking for is insight in the future. What will extra investment in hotel rooms mean for production? In chapter 8, I will come back to this issue.

I would like to conclude this chapter with some further remarks on the relation between the SUT and the TSA. During the construction of the supply and use tables various data sources on production, consumption and other variables must be integrated into a single matrix, the SUT framework. This integration process has a large advantage in that different data sources are being confronted "along the way"; in this way the most reliable estimates of macroeconomic statistics such as GDP and total consumption are obtained. This confrontation of data sources is the strong point of the System of National Accounts.

For the construction of the supply and use tables, tourism information must also be incorporated, particularly if the tourism sector is large. One should think of tourism surveys, producer information (survey or annual reports), tax information (departure tax, for instance), et cetera. This information is used in the supply and use tables and is simultaneously an important data source for the TSA. The TSA tables are compiled using the relevant information on production and consumption of goods and services bought by visitors.

The advantages of compiling the supply and use tables before starting the compilation of the TSA or other satellite accounts are:
1. In the supply and use tables many data sources are confronted which results in more reliable macroeconomic statistics, a result that would not have been obtained if this confrontation had not taken place.
2. There is a reliable framework that offers row and column totals on which the satellite account can be based.
3. The estimates in the satellite accounts are well founded. This means that they do not need to be altered, which could be the case if the satellite account had been compiled before the SUT.
4. An inventory of data sources and processing of the various data sources has already taken place for the compilation of the supply and use tables. This process therefore does not have to be done again. The data sources are ready to be used right away.
5. Estimates made within a satellite account such as tourism value added and tourism consumption can be placed in a relevant context such as their shares in overall GDP.

In appendix 4.1 table A4.1 the various levels of aggregation of the industry categories used in the supply and use tables of Aruba are presented. The International standard industrial classification of all economic activities (ISIC (Rev.3)) of the United Nations is being applied in Aruba.

Notes
[1] The survey on daytrips or 'Onderzoek Dagrecreatie' in Dutch has taken place in 1990/'91, 1995/'96 and in 2001/'02. The sample is drawn on administrative

registers of municipalities. In 2002 about 26,500 persons have been contacted by phone, of which about half, 13,500 persons, have responded. Of these persons 12,000 have consented to keep track on the day trips undertaken and 9,000 persons have actually made one or more daytrips in the two-week period and reported about them.

[2] The continual holiday survey, or 'Continue Vakantie Onderzoek' in Dutch, is a survey based on a panel where a regular group of respondents are asked to supply information on their vacations and business trips in the preceding three months.

[3] The mobility survey, or 'Onderzoek Verplaatsingsgedrag' in Dutch, started at Statistics Netherlands in 1978 but since 2004 has been executed by the 'Adviesdienst Verkeer en Vervoer van Rijkswaterstaat'. Questionnaires consist of a household form and person form where all movements can be registered for one day.

[4] The survey accommodations and lodging or in Dutch 'Statistiek Logiesaccommodaties' includes only establishments with 5 beds if it is a hotel or guesthouse or at least 20 beds for camping sites, group accommodations, et cetera.

[5] The survey inbound tourism, or 'Statistiek Inkomend Toerisme' in Dutch, held in 1999, was planned to interview about 10,000 foreign visitors. The final response was 9439 interviews.

[6] In 1943 a committee, the 'Commissie voor de Nationale Boekhouding', was established by the Director General of Statistics, P.J. Idenburg, to investigate the establishment of a national account (nationale boekhouding), see e.g. Kenessey (1994). There was a tradition already. The first official Statistics Netherlands-estimates of the national income were published in 1933 and refer to the year 1929 (Statistics Netherlands, 1999).

[7] In general, labour accounts are not part of the standard framework as presented by the United Nations but Statistics Netherlands felt that integrating the labour accounts has specific advantages.

[8] The first cruise visitor survey was carried out in 1995 by a consultancy company, however the subsequent surveys of 1997 and 2002 were executed by the CBS of Aruba. Both second and third cruise visitor survey were held using face-to-face interviewing at the cruise terminal and had over a thousand filled questionnaires. The cruise visitor provides detailed information about socio-economic characteristics, level of satisfaction and expenditure of the visitors.

[9] The tourism expenditure survey is a monthly exercise held by the CBS of Aruba. During one week each month face-to-face interviews are carried out in the departure hall of the Queen Beatrix international airport. Over 4,500 questionnaires have been filled out in 1999. The tourism expenditure survey holds about the same questions as the cruise visitor survey, also touching on visitor satisfaction, expenditure and socio-economic characteristics.

[10] The actual question is: "What percentage of the total revenue of this establishment can be attributed tot non-resident persons/companies?" This is question 21 of the "Algemene Vestigingsformulier". This form needs to be completed by all

active establishments. We recall here that a non-resident person is a person not residing in Aruba. This can also be a foreigner residing in Aruba for less than a year or with the intention of remaining on the island for less than a year.

11) The abbreviation c.i.f. stands for cost, insurance, freight, the abbreviation f.o.b. for free on board; see further below for additional remarks and definitions.

12) Some further remarks on output will be useful. The output of agricultural, mining, manufactured goods and construction is estimated by using total revenues from sales. The output of goods bought for resale is measured by the trade margin realized on these goods. The trade margin is defined as the difference between the sales of goods bought for resale and the costs of goods bought for resale. For market services (except financial intermediation services, insurance services, pension fund services, and owner-occupied housing services) the output is calculated by using total revenues from sales of these services. The output of financial intermediation services not explicitly charged is roughly measured by the difference between interests received and interests paid. This indirect measure is known as FISIM (financial intermediation services indirectly measured) (SNA93, par 6.124–6.125). The output of insurance services is equal to the gross premiums earned plus income from investment of the insurance technical reserves minus claims due minus changes in actuarial reserves and reserves for with-profits insurance. The output of pension fund services is equal to gross contributions earned plus income from investment of the reserves of the pension funds minus benefits due minus changes in actuarial reserves. The output of owner-occupied housing services is approximated by market rents for the same kind of housing. For non-market services the output is estimated by using the explicit production costs, that is the sum of intermediate consumption, compensation of employees, consumption of fixed capital and other taxes (minus subsidies) on production. The oil refining activity is registered on a net basis. This implies that a refining fee is calculated and used as the oil refining activity's output (CBS of Aruba, 2003b).

13) For additional remarks on the outputs, see the appendix to this sub-section.

14) The purchaser pays the purchaser's price, excluding any deductible value added type taxes (VAT) or similar deductible tax, in order to take delivery of a unit of a good or service at the time and place required by the purchaser. 'The purchaser's price of a good includes any transport charges paid separately by the purchaser to take delivery at the required time and place (SNA93, par. 6.215)'.

15) Import documents registered by the customs department have been analysed to obtain this percentage.

16) The government annual reports are the data supplier of taxes less subsidies on products. For the import duties the information from the annual reports is combined with information from the foreign trade statistics to derive at the breakdown per product.

17) Part of the operating surplus of households is generated by own account

workers. Because the wages and salaries of own account workers are difficult to estimate, mixed income is introduced. Own account workers sometimes forego on their salary for the sake of the business, especially during the start up period. In case of households, the balancing item is operating surplus/mixed income.

[18] The tourism expenditures on goods and services are based on the tourism expenditure survey of the Central Bureau of Statistics of Aruba.

[19] The Income and Expenditure survey 1998 classifies the expenditure categories according to a national product classification based on the COICOP (Classification of Individual Consumption by Purpose). The expenditures are also linked to SNA93 concepts and classifications. Household consumption expenditure is estimated by extrapolating the 1998 data for 1999 taking some aspects into account such as population correction, inflation correction, income effect, high earners' effect and correction for products underrated in the Income and Expenditure survey 1998.

[20] Trips to the drive-in of fast food restaurants are excluded as well as public transportation which is used for commuting.

[21] In the use table of the Aruba national accounts this amount is found in the row 'expenditures abroad' a column 'final consumption expenditure'.

[22] The estimation of the amount of the investment of non-residents in timeshare is made by deducting the cost of the room from the room sale. For the timeshare resort the sale of the timeshare is an output while for the buyer, resident or non-resident, it is an investment for the complete amount of the timeshare sale. Due to the creation of the notional non-financial company only the timeshare room margin is taken as investment for the year of sale. As the construction has already taken place, there is only a transfer of ownership for the cost of sale from the timeshare resort to the notional entity or for residents to the household sector (WTO, 1995, p. 80).

[23] The Dutch equivalent is 'logeergasten belasting'.

[24] The economic indicators presented in this report originate from several organizations in Aruba such as the Central Bank of Aruba, Aruba Tourism Authority, the AIB databank, several ministries and other sources (Steenge, 1990b).

Appendix 4.1

Table A4.1
Industry classification of the supply and use tables of Aruba

national accounts classification	International standard industrial classification of all economic activities (ISIC (Rev.3))			
	Tabulation categories	*Division*	*Group*	*Class*
Industries				
Agriculture, hunting, forestry; Fishing; Mining and quarrying				
Agriculture, hunting and forestry	A			
Fishing	B			
Mining and quarrying	C			
Manufacturing				
Manufacture of food products, beverages and tobacco	D*	15, 16		
Manufacture of textiles, textile- and leather products	D*	17, 18, 19		
Manufacture of wood products, pulp, paper and paper products; publishing	D*	20, 21, 22		
Manufacture of chemicals, chemical products and man-made fibres	D*	24		
Manufacture of rubber and plastic products, and other non metallic mineral products	D*	25, 26		
Manufacture of basic metals and fabricated metal products	D*	27, 28		
Manufacture of machinery and equipment n.e.c.	D*	29		
Manufacture of electrical and optical equipment	D*	30, 31, 32, 33		
Manufacture of transport equipment	D*	34, 35		
Manufacturing n.e.c.	D*	36, 37		
Electricity, gas and water supply; Manufacture of refined petroleum products				
Production, collection and distribution of electricity	E*	40*	401	
Manufacture of gas; distribution of gaseous fuels through mains	E*	40*	402	
Collection, purification and distribution of water	E*	41		
Coastal refinery	D*	23		
Construction				
Construction	F			
Wholesale and retail trade; Repair of motor vehicles and household goods				
Sale, maintenance and repair of motor vehicles and motorcycles	G*	50		
Wholesale trade and commission trade; except motor vehicles	G*	51		
Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods	G*	52		
Hotels				
Hotels	H*		551	
Restaurants				
Restaurants	H*		552	
Transport, storage and communications				
Land transport	I*	60		
Water transport	I*	61		
Air transport	I*	62		
Supporting and auxiliary transport services; activities of travel agencies	I*	63		
Postal Services	I*	64*	641	
Telecommunications	I*	64*	642	
Financial intermediation				
Central Bank of Aruba	J*	65*	651*	6511
Commercial banks	J*	65*	651*	6519
Other financial institutions	J*	65*	659	
Life insurance companies	J*	66*	660*	6601
Pension funds	J*	66*	660*	6602
Non-life insurance companies	J*	66*	660*	6603
Financial auxiliaries	J*	67		
Real estate activities				
Real estate activities with own or leased property	K*	70*	701	
Real estate activities on a fee or contract basis	K*	70*	702	

Table A4.1
Industry classification of the supply and use tables of Aruba

national accounts classification	International standard industrial classification of all economic activities (ISIC (Rev.3))			
	Tabulation categories	*Division*	*Group*	*Class*
Industries				
Other business activities				
Renting of machinery and equipment without operator and of personal and household goods	K*	71		
Computer and related activities	K*	72		
Research and development	K*	73		
Other business activities	K*	74		
Public administration; Compulsory social security; Education				
Public administration and defence; compulsory social security	L			
Education	M			
Health and social work				
Health and social work	N			
Other community, social and personal service activities				
Sewage and refuse disposal, sanitation and similar activities	O*	90		
Activities of membership organizations n.e.c.	O*	91		
Motion picture, radio, television and other entertainment activities	O*	92*	921	
News agency activities	O*	92*	922	
Library, archives, museums and other cultural activities	O*	92*	923	
Sporting activities and related services	O*	92*	924*	9241*
Activities of casino's and lotteries	O*	92*	924*	9249*
Activities of "nummerkantoren"	O*	92*	924*	9249*
Other recreational activities.	O*	92*	924*	9249*
Other service activities	O*	93		
Private households with employed persons	P			
Adjustment for FISIM				
Financial intermediation services indirectly measured (FISIM)				

Source: CBS of Aruba, 2003b.

Table A4.2
Supply table Aruba, 1999

	Output of industries			
	Agriculture, hunting, forestry; fishing; mining and quarrying	Manufac- turing	Electricity, gas and water supply; manufacture of refined petroleum products	Construc- tion
	mln Afl			
Products				
Agriculture, forestry and fishery products	10.86			
Ores and minerals; electricity, gas and water	5.06	3.19	307.38	6.69
Food products, beverages and tobacco; textiles, apparel and leather products		100.81		
Other transportable goods, except metal products, machinery and equipment		96.40	75.55	24.75
Metal products, machinery and equipment		59.44		
Constructions and construction services; intangible assets		9.17		504.24
Trade services				4.97
Lodging; food and beverage serving services				
Transport and storage services		1.11		
Financial intermediation, insurance and auxiliary services				
Real estate services		0.75		0.36
Leasing or rental services without operator		0.26		
Business and production services	11.13	0.10	352.84	0.14
Public administration,compulsory social security services and education services				
Health and social services	0.36			
Recreational, sporting and other social and personal services				
Adjustments				
C.i.f./f.o.b. adjustment on imports				
Expenditures abroad				
Total	27.41	271.23	735.77	541.15

Source: CBS of Aruba, 2003b.

Wholesale and retail trade; repair of motor vehicles and household goods	Hotels	Restaurants	Transport, storage and communications	Financial intermediation	Real estate activities	Other business activities	Public administration; compulsory social security; education
			0.13	0.23		0.88	0.97
628.98	0.41	1.65				7.06	
	419.38	254.09	0.69				0.21
			384.90				
				280.35			
20.06	8.16	0.43	3.04	4.63	400.80	1.91	7.92
	0.66		2.85			73.26	
20.31	12.11		163.53	2.00		250.37	
			5.59			1.17	531.11
0.11	49.80					1.56	0.01
669.46	490.52	256.17	560.73	287.21	400.80	336.21	540.22

Table A4.2 (end)
Supply table Aruba, 1999

	Output of industries		
	Health and social work	Other community, social and personal service activities	Adjustment for fisim

Products

Agriculture, forestry and fishery products			
Ores and minerals; electricity, gas and water			
Food products, beverages and tobacco; textiles, apparel and leather products			
Other transportable goods, except metal products, machinery and equipment			
Metal products, machinery and equipment			
Constructions and construction services; intangible assets	0.14	0.01	
Trade services	0.23	5.72	
Lodging; food and beverage serving services	0.52	11.38	
Transport and storage services			
Financial intermediation, insurance and auxiliary services			
Real estate services	0.52	1.90	
Leasing or rental services without operator			
Business and production services	0.50		
Public administration,compulsory social security services and education services	2.65	1.03	
Health and social services	138.27		
Recreational, sporting and other social and personal services	0.06	294.86	

Adjustments

C.i.f./f.o.b. adjustment on imports			
Expenditures abroad			

Total	142.89	314.90	0.00

Source: CBS of Aruba, 2003b.

Total domestic supply	Imports of goods and services	C.i.f./ f.o.b. adjustments on imports	Total supply at basic prices	Trade and transport margins	Taxes less subsidies on products	Total supply at purchasers' prices
10.86	45.73		56.59	11.73	1.29	69.61
322.32	76.36		398.68	1.70	0.42	400.80
100.81	671.71		772.52	267.96	58.57	1,099.05
196.70	457.51		654.21	260.69	84.50	999.40
59.44	621.17		680.61	106.30	52.69	839.60
515.77	99.33		615.10			615.10
649.02			649.02	−648.38		0.64
686.27			686.27		19.51	705.78
386.01	185.56	−159.16	412.41		−6.08	406.33
280.35	51.84	−28.09	304.10		22.09	326.19
450.48			450.48			450.48
77.03	31.15		108.18			108.18
813.03	266.64		1,079.67		6.24	1,085.91
541.55	12.56		554.11			554.11
138.63			138.63			138.63
346.40	13.89		360.29		−0.77	359.52
	−187.25	187.25	0.00			0.00
	264.00		264.00			264.00
5,574.67	2,610.20	0.00	8,184.87	0.00	238.46	8,423.33

Table A4.3
Use table Aruba, 1999

	Intermediate consumption of industries			
	Agriculture, hunting, forestry; fishing; mining and quarrying	Manufac turing	Electricity, gas and water supply; manufacture of refined petroleum products	Construc– tion
	mln Afl			
Products				
Agriculture, forestry and fishery products	1.86	15.47	0.43	0.31
Ores and minerals; electricity, gas and water	1.27	3.62	183.55	22.42
Food products, beverages and tobacco; textiles, apparel and leather products	4.62	44.35	10.77	1.75
Other transportable goods, except metal products, machinery and equipment	1.81	44.26	96.17	163.47
Metal products, machinery and equipment	1.46	16.68	148.93	73.45
Constructions and construction services; intangible assets	0.06	0.29	5.22	40.53
Trade services		0.08		
Lodging; food and beverage serving services	0.03	0.45	2.25	0.43
Transport and storage services	0.71	3.61	5.99	1.92
Financial intermediation, insurance and auxiliary services	0.39	1.69	8.14	3.98
Real estate services	0.25	2.01	4.83	2.17
Leasing or rental services without operator	0.58	0.85	12.77	5.12
Business and production services	1.50	17.39	55.37	29.34
Public administration,compulsory social security services and education services	0.01	0.32	1.27	0.31
Health and social services	0.01		0.03	0.01
Recreational, sporting and other social and personal services	0.10	0.42	0.59	1.37
Adjustments				
Expenditures abroad	0.93	8.71	9.38	16.17
Total uses at purchasers' prices	15.59	160.20	545.69	362.75
Total output at basic prices	27.41	271.23	735.77	541.15
Total gross value added at basic prices	11.82	111.03	190.08	178.40
Other taxes less other subsidies on production	0.11	0.76	1.21	0.46
Compensation of Employees	7.90	74.29	85.70	138.14
Operating surplus/ mixed income, gross	3.81	35.98	103.17	39.80
Total gross value added at basic prices	11.82	111.03	190.08	178.40
Taxes less subsidies on products				
Total gross value added at market prices				

Source: CBS of Aruba, 2003b.

Wholesale and retail trade; repair of motor vehicles and household goods	Hotels	Restau–rants	Transport, storage and commu–nications	Financial interme–diation	Real estate activities	Other business activities	Public admini–stration; compul–sory social security; education
0.10	8.33	3.41	0.32	0.07	0.16	0.03	0.57
13.36	40.21	6.69	7.06	0.88	3.07	2.76	10.40
11.04	74.35	92.22	8.88	0.30	0.06	2.45	6.58
30.16	11.71	6.87	40.33	5.85	3.31	16.27	12.51
22.42	3.15	1.82	24.65	0.61	0.34	4.70	11.44
3.24	17.13	3.85	1.73	0.49	2.28	2.83	6.00
0.48	0.01						0.07
2.88	0.96	0.43	8.70	1.12	0.36	1.52	1.96
6.08	18.00	2.14	76.66	0.43	0.84	2.76	3.76
22.52	7.84	3.53	11.39	37.65	1.21	6.78	3.49
29.64	19.95	8.57	7.63	2.18	1.92	6.16	10.59
6.05	2.10	0.93	18.98	0.72	0.09	3.71	4.59
63.26	34.17	11.95	93.19	28.35	5.73	49.50	51.08
3.52	1.46	0.44	0.62	0.44	0.08	1.15	4.66
0.08	0.05	0.01	0.12	0.03		0.04	0.10
0.90	4.30	1.71	0.95	0.17	0.08	1.99	3.93
28.53	26.06	8.67	14.43	12.01	0.71	17.73	2.82
244.26	269.78	153.24	315.64	91.30	20.24	120.45	134.48
669.46	490.52	256.17	560.73	287.21	400.80	336.21	540.22
425.20	220.74	102.93	245.09	195.91	380.56	215.76	405.74
6.28	3.01	0.44	1.76	1.18	0.09	2.80	0.33
238.06	202.27	74.05	123.33	102.65	6.05	151.48	365.27
180.86	15.46	28.44	120.00	92.08	374.42	61.48	40.14
425.20	220.74	102.93	245.09	195.91	380.56	215.76	405.74

Table A4.3 (end)
Use table Aruba, 1999

	Intermediate consumption of industries		
	Health and social work	Other community, social and personal service activities	Adjustment for fisim
	mln Afl		
Products			
Agriculture, forestry and fishery products	0.32	0.95	
Ores and minerals; electricity, gas and water	2.38	6.21	
Food products, beverages and tobacco; textiles, apparel and leather products	10.24	22.79	
Other transportable goods, except metal products, machinery and equipment	7.15	24.37	
Metal products, machinery and equipment	2.03	7.89	
Constructions and construction services; intangible assets	0.26	1.21	
Trade services			
Lodging; food and beverage serving services	0.50	1.67	
Transport and storage services	0.53	1.75	
Financial intermediation, insurance and auxiliary services	0.95	3.21	139.56
Real estate services	2.18	11.00	
Leasing or rental services without operator	0.20	0.93	
Business and production services	3.89	17.55	
Public administration,compulsory social security services and education services	0.38	1.29	
Health and social services	0.16	0.50	
Recreational, sporting and other social and personal services	0.67	3.15	
Adjustments			
Expenditures abroad	9.57	10.26	
Total uses at purchasers' prices	41.41	114.73	139.56
Total output at basic prices	142.89	314.90	0.00
Total gross value added at basic prices	101.48	200.17	−139.56
Other taxes less other subsidies on production	0.56	18.82	
Compensation of Employees	81.71	122.47	
Operating surplus/ mixed income, gross	19.21	58.88	−139.56
Total gross value added at basic prices	101.48	200.17	−139.56
Taxes less subsidies on products			
Total gross value added at market prices			

Source: CBS of Aruba, 2003b..

Total intermediate consumption	Exports of goods and services	Final consumption expenditure	Gross capital formation	Total uses at purchasers' prices
32.33	15.44	20.58	1.26	69.61
303.88	0.79	95.96	0.17	400.80
290.40	495.37	285.86	27.42	1,099.05
464.24	240.33	249.80	45.03	999.40
319.57	27.59	126.07	366.37	839.60
85.12	3.00	16.14	510.84	615.10
0.64				0.64
23.26	639.77	42.75		705.78
125.18	255.19	25.82	0.14	406.33
252.33	4.00	69.86		326.19
109.08		341.40		450.48
57.62	49.76	0.80		108.18
462.27	502.89	119.77	0.98	1,085.91
15.95		538.16		554.11
1.14	1.60	135.89		138.63
20.33	229.75	109.44		359.52
165.98		98.02		264.00
2,729.32	2,465.48	2,276.32	952.21	8,423.33
5,574.67				
2,845.35				
37.81				
1,773.37				
1,034.17				
2,845.35				
238.46				
3,083.81				

Table A4.4
Tourism supply Aruba, 1999

	Characteristic tourism activities		
	Hotels	Time-share resorts	Apart-ments, villa's
Products	*mln Afl*		
Characteristic services			
Hotel and other lodging services	252.94	72.94	2.35
Food serving services; beverage serving services			
for consumption on the premises	74.56	13.03	
Land transport services			
Air transport services			
Supporting and auxiliary transport services			
Real estate services for timeshare sales	0.47	83.21	
Leasing or rental services without operator	0.65		
Support services			
Gambling and betting services	49.46		
Other recreational, cultural and sporting services			
Non characteristic goods and services			
Retail trade services	0.41		
Telecommunications services; information retrieval and supply	5.69	2.77	
Other professional, scientific and technical services			
Non specific goods and services			
Total output	384.18	171.95	2.35
Total uses at purchasers' prices	170.64	91.06	0.76
Total gross value added at basic prices	213.54	80.89	1.59
Taxes less subsidies on products	15.03	4.34	0.14
Other taxes less other subsidies on production	2.35	0.54	0.01
Compensation of employees	141.84	55.19	0.41
Operating surplus/mixed income, gross	69.35	25.16	1.17
Total gross value added at market prices			

Source: Van de Steeg, 2005a.

Bars	Full service restaurants	Fast food restaurants and caféterias	Night-clubs, dinner theaters	Taxi and busses	Scheduled air transport	Other supporting transport activities	Renting of land transport equipment
8.00	129.60	45.75	6.99				
				30.55			
					132.76		
						28.16	
							41.45
					2.47		
	0.22	0.36					
8.00	129.82	46.11	6.99	30.55	135.23	28.16	41.45
5.68	76.64	30.71	5.26	7.18	148.46	6.00	13.80
2.32	53.18	15.40	1.73	23.37	−13.23	22.16	27.65
						−0.08	
0.01	0.17	0.08	0.01	0.07	0.11	0.12	0.26
1.79	39.80	12.18	1.98	0.28	21.54	12.78	10.06
0.52	13.21	3.14	−0.26	23.02	−34.88	9.26	17.33

Table A4.4 (end)
Tourism supply Aruba, 1999

	Characteristic tourism activities			
	Sporting activities and relates services; also sport-fishing and hunting	Casino activities	Water-sport activities	Other recrea-tional activities
Products	*mln Afl*			
Characteristic services				
Hotel and other lodging services				
Food serving services; beverage serving services for consumption on the premises	1.48	2.98		2.10
Land transport services				
Air transport services				
Supporting and auxiliary transport services				
Real estate services for timeshare sales				
Leasing or rental services without operator				
Support services				
Gambling and betting services		126.80		
Other recreational, cultural and sporting services	9.14		19.20	28.93
Non characteristic goods and services				
Retail trade services	0.02	0.32	4.80	0.37
Telecommunications services; information retrieval and supply				
Other professional, scientific and technical services				
Non specific goods and services				
Total output	10.64	130.10	24.00	31.40
Total uses at purchasers' prices	6.28	41.47	11.69	15.74
Total gross value added at basic prices	4.36	88.63	12.31	15.66
Taxes less subsidies on products				
Other taxes less other subsidies on production	0.05	18.03	0.09	0.11
Compensation of employees	1.89	43.31	6.87	8.24
Operating surplus/mixed income, gross	2.42	27.29	5.35	7.31
Total gross value added at market prices				

Source: Van de Steeg, 2005a.

	Non-characteristic activities			Total tourism supply	Non-specific activities	Total domestic supply	Taxes less subsidies tourism tax	Total supply at pur-chasers' prices
	Retail trade	Telecom-munications	Photo-graphic activities					
				328.23	3.55	331.78	19.51	351.29
				284.49	70.00	354.49		354.49
				30.55	9.09	39.64	−6.00	33.64
				132.76	22.86	155.62		170.12
				28.16	152.17	180.33	−0.08	191.35
				83.68	0.00	83.68		83.68
				42.10	34.93	77.03		108.18
				2.47	91.44	93.91		93.91
				176.26	4.86	181.12		181.12
				57.27	31.85	89.12	−0.77	102.24
	75.47			81.97	314.60	396.57		396.57
		1.61		10.07	159.27	169.34		209.74
			2.36	2.36	100.73	103.09		201.75
					3,318.95	3,318.95	225.8	5,945.25
	75.47	1.61	2.36	1,260.37	4,314.30	5,574.67	238.46	8,423.33
	31.08	0.35	1.33	664.14	2,065.18	2,729.32		
	44.39	1.26	1.03	596.23	2,249.12	2,845.35		
				19.43	219.03	238.46		
	0.38	0.00	0.02	22.41	15.40	37.81		
	32.34	0.26	0.73	391.48	1,381.89	1,773.37		
	11.67	1.00	0.28	182.34	851.83	1,034.17		
						3,083.81		

5. Tourism investment

5.1 Introduction

As we have noted earlier, the TSA framework includes the measurement of gross fixed capital formation related to tourism (table 8 in the TSA: RMF recommended set of tables). Gross fixed capital formation related to tourism (also known as tourism investment) is estimated to provide statistics on developments in the tourism infrastructure of a country. We are then discussing "capacities" such as the number of rooms in hotels, tables in restaurants and seats in airplanes. Clearly, the composition of tourism, like the distribution between younger and older visitors, and high or low budget visitors, is determined by the level or type of (gross or net) fixed capital formation available. Also, the future of tourism in an economy is highly dependent on the investments at an earlier stage. The presence of a certain minimum amount of infrastructure in terms of transportation, accommodation, recreational facilities, et cetera, determines to a large extent the nature and scale of the visitor flow.

Gross fixed capital formation is defined in SNA93 as the 'total value of a producer's acquisitions, less disposals, of fixed assets during the accounting period plus certain additions to the value of non-produced assets realized by the productive activity of institutional units. Fixed assets are tangible or intangible assets produced as output from processes of production that are themselves used repeatedly or continuously in other processes of production for more then one year' (par. 10.33). Gross fixed capital formation thus covers both produced tangible and intangible capital. Included are not only buildings, runways, transport equipment and computers, but also intangible produced assets, of which computer software is the most important for tourism.

It may already be intuitively evident from the examples given above, which types of gross fixed capital formation are related to tourism. However, the measurement of tourism investment encounters specific theoretical and practical difficulties. Railway infrastructure, for instance, is used by visitors but also by commuters. Given such mixed uses of capital goods, it is necessary to establish how such types of fixed capital formation should be treated in compiling the relevant statistics.

I will discuss tourism gross fixed capital formation along a methodological and practical line. The objective of section 5.2 is to give a description of the present theoretical framework underlying the compilation of tourism investment statistics. I will take the concepts put forward in the TSA: RMF on the compilation of tourism gross fixed capital formation as the starting point in the discussion of the theoretical framework.

In section 5.3, methods for compiling the tourism investment tables in different countries will be compared. In this way, we will gain an impression of the type of attempts that have been made to estimate tourism gross fixed capital formation. However, as we shall see, the methodology for the compilation of the tables as used in many of these countries, has not been recorded properly. In this way, we do not gain sufficient insight in the choices which have been made and the issues that (still) exist. I have gathered literature and practices of various countries on the compilation of tourism gross fixed capital formation. I have applied this knowledge to the case of the Netherlands. Fortunately, an extensive and detailed set of basic data is available for the Netherlands, a prerequisite for any numerical exercise. In terms of strategy, I started from the basic concepts and guidelines available now. In section 5.4, tourism gross fixed capital formation tables are presented for the Netherlands for the years 2001–2003. The Dutch case will be used to discuss a number of practical and methodological problems with respect to measurement of tourism capital formation. In the concluding remarks which finalize the chapter in section 5.5, I will come back to this. We shall find that the measurement of gross fixed capital formation may be a good initiative in certain cases, but so far there still appear to be a number of issues that have to be addressed first, before any form of wide scale application of the table is possible.

5.2   Estimating tourism investment

5.2.1   What to measure?

A major difficulty in measuring tourism investment forms the identification of that part of gross fixed capital formation, produced or acquired specifically for the benefit of tourism. Regarding that point (and given its nature), gross fixed capital formation related to tourism can be approached from several directions. These different directions are given below (see also TSA: RMF, p. 34). Evidently, a choice has to be made concerning that part of gross fixed capital formation that should be labeled as benefiting tourism. The options are:

1. To look at total gross fixed capital formation of the tourism characteristic industries. In that case, all gross fixed capital formation of *these* industries will be included in the measurement of tourism investment regardless of the actual purpose or use of the investment. Examples are hotel buildings and reservation software.
2. To look at gross fixed capital formation of tourism specific capital goods, *irrespective of who invests*. We then are talking about capital goods which are directly linked to the provision of services to visitors. Transactors, the tourism industries, governmental agencies, and others parties in the economy may be involved in building tourism specific capital goods. Tourism infrastructure expenditure of public authorities will be specifically covered in this approach. The construction and renovation of museum buildings are an example of such capital formation undertaken by the government.

3. To determine the proportion of total gross fixed capital formation that is required to provide goods and services to visitors. This method clearly is *a more abstract way* of estimating tourism investment. Included in this approach is all gross fixed capital formation associated with tourism, from hotel buildings to airports.

If one opts for the third approach, it will be unclear how 'the proportion that is required' should be determined, or to which proportion precisely it refers to. This proportion may refer to a minimum, maximum, average, or to any other proportion. Also the term 'required' does not give an exact indication of what the proportion should be. It seems the third approach suggests measuring tourism investment, by taking a certain proportion of total investment that supports or may produce a certain level of production of goods and services for tourism. However, for this approach to work it has to be established what the level of goods and services is that needs to be produced. The level of goods and services produced for tourism may refer to a current level, a current level adjusted to an expected growth rate, or an ideal level of production for which capital goods are required. Finally, the time-lag between investment and production also needs to be taken into account for such calculations.

Gross fixed capital formation related to tourism can also be estimated using a combination of the above mentioned approaches. In the TSA: RMF manual, preference is given to a combination of two approaches to measure tourism investment. The measurement of total gross fixed capital formation of the tourism characteristic industries is combined with the estimation of gross fixed capital formation in tourism specific capital goods. The lay-out of the table on tourism investment as recommended in the TSA: RMF (see table A3.8 in appendix 3.1 of chapter 3) is in line with this. *However, there is no proposal for a specific aggregate for tourism gross fixed capital formation*! In the TSA: RMF it is (solely) mentioned that more research on tourism gross fixed capital formation is required to recommend a specific aggregate and that the interest and analytical requirements of the compiling countries should be taken into account when selecting the perspective (TSA: RMF, par. 2.85). During my research I have encountered different practices used by various countries. So far, not one method has excelled as the method that should be adopted to measure gross fixed capital formation related to tourism. In this chapter, we shall address this issue, hoping to contribute to the discussion on estimating tourism investment.

Estimating tourism gross fixed capital formation is limited to those produced fixed assets owned by resident producers of the estimating country. Excluded is gross fixed capital formation which is operated on the economic territory but is owned by non-residents. This is particularly relevant in the case of mobile assets, like aircrafts, trains, boats and autobuses. Those assets which are owned by resident producers are covered by the appropriate concept, but those owned by non-residents are excluded, even if they operate in the economic territory of the country

of reference (WTO, 2000a, par. 2.22). Hotels, restaurants and local airlines are resident of the country of reference as they cannot or are not (in case of a floating restaurant or hotel) moved outside the country.

<h3>5.2.2   Aggregates</h3>

Within the TSA methodology, different aggregates are distinguished. In the TSA: RMF manual, the aggregate "total tourism demand" is introduced as the sum of internal tourism consumption complemented with other components of final demand, generated by a focus on visitors (TSA: RMF, par. 2.85 and 4.116). Total tourism demand is a synthetic measurement obtained by the aggregation of internal tourism consumption, tourism gross fixed capital formation and tourism collective consumption (TSA: RMF, par. 4.105 and 4.117). This aggregate can be of analytical interest in the estimation of the economic size of tourism in a country of reference. However, the compilation of this aggregate has been postponed by the UNWTO. The reason for this is that the methods for the measurement of tourism gross fixed capital formation and tourism collective consumption are still being debated. The concept of total tourism demand has currently not been precisely defined (TSA: RMF, par. 4.117–4.118).

For the calculation of the aggregate "total tourism demand", the manual 'TSA: the conceptual framework' (WTO, 1999, par. 4.88) suggests that part of gross fixed capital formation needs to be allocated to tourism as is proposed for tourism collective consumption[1]. Allocating a part of gross fixed capital formation to tourism, using ratios, is a controversial issue.

Using ratios to allocate parts of gross fixed capital formation of the characteristic industries involves different methodological problems. In the OECD manual it is pointed out that for some tourism industries with a single products output, using ratios is straightforward, but for tourism industries with multiple products this approach is problematic (OECD, 2000, p. 32–33). This can be illustrated using air transport and railway transport as examples. For an industry like air transport, almost all output is acquired by visitors, therefore simply all the capital formation of this industry can be included in tourism investment. However, for industries that use the same capital for different purposes, like rail transport, determining a ratio is often not a straightforward matter. The marginal cost of capital in meeting tourism demand may be close to zero in railway transport, as commuters make up most of the users. Tourism then is a relatively small element.

The use of a ratio may be legitimate for industries with a high tourism ratio, but becomes ambiguous for industries with a low tourism ratio (OECD, 2000, p. 32–33). The allocation issue is circumvented by including gross fixed capital formation of the tourism industries in tourism investment in its entirety. This approach is supported in both the TSA: RMF and OECD (2000) manual.

There is much debate about the inclusion of tourism investment in the aggregate tourism demand. In the OECD manual (2000), it is argued that gross fixed capital formation of the tourism industry does not constitute tourism demand. According to the OECD manual "there is no direct relationship between the visitor and the acquisition of capital by the tourism industry. The visitor will use the stream of services provided by such capital but the acquisition of the capital is undertaken by the industry. Tourism gross fixed capital is a very important variable, but has only an indirect impact on tourism demand and tourism value added" (2000, p. 32). Investment has indeed only an indirect effect on tourism demand. In this respect the argument put forward in the OECD manual is correct, but we can state that the TSA: RMF (par. 2.82) manual remark is also true, that the indirect effect of investment on different aspects of tourism should be recognized.

The analysis of tourism investment benefits from the attention it received, when included in the broader aggregate of total tourism demand. It should be kept in mind that tourism investment influences tourism consumption in the future. However, it is not clear how tourism investment can be included in tourism demand without the use of ratios.

5.2.3 Investment by tourism characteristic industries [2]

It is important to identify what tourism characteristic industries are acquiring in terms of capital in order to better understand present and future capital needs. Knowledge of capital acquisition may serve as an indicator of the strength or weakness of the industry, providing signs of entry or exit from the tourism characteristic industries. A robust capital acquisition, for example, indicates optimism on the part of the entrepreneurs and shows that the capital is new and attractive to visitors (OECD, 2000, p. 33). The following industries play a central role in tourism and are identified in the TSA: RMF as tourism characteristic industries:

- hotels and similar;
- restaurants and similar;
- railway passenger transport services;
- road passenger transport services;
- water passenger transport services;
- air passenger transport services;
- transport supporting services;
- transport equipment rental;
- travel agencies and similar;
- cultural services and sporting;
- other recreational services.

Gross fixed capital formation of each characteristic industry is included in tourism investment in its entirety.

Tourism related investment by the government

The relationship of the government[3] to tourism is not a straightforward one, and not easy to establish in a measurable form. Public authorities construct infrastructure to facilitate tourism at a specific moment in time, or this infrastructure facilitates tourism, although this was not necessarily the primary objective of the investment. These investments are needed in the production process of particular tourism services, although they are not necessarily economically part of the production process. Without roads, airports, and basic infrastructure such as water, sewage, electricity and health services, tourism cannot exist (WTO, 2000a, par. 2.18).

Gross fixed capital formation of the government related to tourism is limited to tourism specific capital goods, which are directly linked to the provision of services to visitors. Tourism specific capital formation can be made by any transactor, like the government and non-tourism industries, but covers in particular tourism infrastructure expenditure by public authorities. The relationship with visitors is relatively simple to identify, as some fixed assets are specifically designed in order to participate in the production of tourism services. Museums and theatres are among the most obvious examples. If tourism would not exist, such assets would be severely impacted in terms of their utility to non-tourism applications.

Transportation is a tourism specific industry, but investment in transportation by the government is usually not undertaken specifically for the purpose of tourism. However, for the investment to be included in tourism investment, tourism needs to be the main purpose (WTO, 2000a, par. 4.45). Therefore, government investment in transportation has been excluded from the measurement of tourism investment for the moment[4] (OECD, 2000, p. 33 and WTO, 1999, par. 4.90). Gross fixed capital formation of the government in transportation, like roads, seaports and rail tracks, are used more frequently for non-tourism than for tourism purposes.

The enterprises are classified into industry categories, depending on the kind of products they produce. The classification of parts of government takes place using a different method. The expenditures of the government are classified in categories of functions of government. The classification of functions identifies the objectives or purposes for which, in this case, the government engages in certain transactions. The expenditures of the government are used for the classification instead of the production. This has to do with the way production of the government is valued in the SNA93. The expenditure of the government includes the expenditure on investment. For the classification of the expenditure of government by function the Classification of the Functions of Government (COFOG, UNSD, 1999) is used, or a classification linked to this international acknowledged classification. The application of this classification is further addressed in chapter 6, which discusses tourism collective consumption.

5.2.5   *Tourism dwellings*

Tourism dwellings include 'vacation homes and other second homes that are different from the main residence of the household and acquired with the objective of being used on a non-permanent basis by members of the household owning it. They might have also been acquired or constructed with the particular objective of being used by visitors according to different types of contract. This category includes accommodation within time-sharing schemes' (TSA: RMF, Annex IV, par. 1.2).

The acquisition of second homes is regarded as part of tourism gross fixed capital formation and is found in a separate column, second home ownership in table 8 presented as part of the recommended framework (TSA; RMF). Second homes are regarded as residential structures that households own in a different environment from that of their primary residence and are used as a retreat of some sort from their primary residence. For second homes to be included in tourism investment, they must be considered to be outside the "usual environment" and used for tourism purposes. Drawing such a distinction, according to the frequency with which the second home is to be used or the distance to the second home, may be difficult. Therefore, determining if the second home is outside the 'usual environment' is not easy to establish. Second homes which serve as a business location or as a place to stay while at another business location are not included as they are part of the "usual environment".

In summary, included among second homes are time-share units and recreational homes, providing they are located outside the "usual environment" and used for tourism purposes. Time-share units are usually located in a tourism area and are owned by many different parties in common. Each party is assigned time to use the unit during the year. Time-share units can be exchanged with other owners or rented to third parties (OECD, 2000). Recreational homes are often located in scenic areas and are constructed for the purpose of tourism or recreation. However, recreational homes are sometimes permanently inhabited, which disqualifies them as a tourism dwelling as they have become part of the 'usual environment'.

When the sale of, for instance, a vacation dwelling takes place between two residents of the country of reference, the positive and negative values recorded for gross fixed capital formation are canceled out for the economy as a whole, except for the cost of ownership transfer (SNA93, par. 10.41) [8]. Tourism dwellings sold by a resident household to a non-resident household show a negative value for the household sector and a positive value for the non-financial corporations sector. For gross fixed capital formation, like the purchase of vacation dwellings, by non-residents, a notional quasi-corporation [9] is created in accordance with concepts and accounting rules of SNA93 (par. 10.60). This notional quasi-corporation is resident of the country where the gross fixed capital formation (vacation dwelling) is located and is part of the non-financial corporations sector of this country. Within the

national accounts there is a financial transaction visible between the rest of the world account (abroad) and one of the domestic sectors (household sector in this case) with which the transaction has been undertaken. The tourism investment table does not include institutional sectors and therefore any shifts between institutional sectors are not visible in the table.

5.2.6 Other investments in tourism

It has been pointed out in the TSA: RMF and OECD manual (2000) that all capital acquisition by tourism characteristic industries should be included in the TSA. This means that not only gross fixed capital formation should be estimated, but also other, non-produced non-financial capital. These assets are not produced and are therefore not part of gross fixed capital formation (SNA93). Non-produced non-financial assets can be split in tangible non-produced assets, like land, and intangible non-produced assets, like licensing rights, leasing agreements and landing rights which are used in the productive process for more than a year. The first reason for including non-produced non-financial assets in the measurement of tourism investment is that the total capital base is important for measuring the return to characteristic tourism industries' capital stock. Secondly, it is important to identify what tourism industries are acquiring in terms of capital to better understand present and future capital needs. Some of these assets, like land, represent a substantial source of revenue for governments and other entities as for instance taxes may be levied on these assets.

The table on tourism investment as recommended in the TSA: RMF includes non-produced non-financial assets as a memorandum item. This is to underline the importance given to the measurement of non-produced non-financial assets. There are also some compilation problems associated with the inclusion of non-produced non-financial assets. It is, for instance, recognized that obtaining data on land use may be very difficult. Also the valuation of intangible non-produced assets, like landing rights, may have some complications.

A separate column is included in the tourism investment table as recommended by the TSA: RMF for gross fixed capital formation of tourism specific capital goods undertaken by non-tourism non-government industries. This gross fixed capital formation of tourism specific capital goods has to be directly linked to the provision of services to visitors. Because any industry can establish this kind of gross fixed capital formation, it is more difficult to detect and estimate.

5.3 International comparison of used methodology

In the introduction to this chapter we saw that the measurement of tourism investment is not a completely unexplored territory. A survey conducted by the

World Tourism Organization (UNWTO) shows that France, Hungary, Indonesia, Morocco, Poland, Spain, Thailand compile a tourism investment table (UNWTO, 2005b). Some examples of the tourism investment tables of other countries show that tourism investment is usually measured as total gross fixed capital formation of the tourism characteristic industries.

Norway presents gross fixed capital formation by characteristic industry, both in current and constant prices. However, no information is presented in the Norwegian tables about second homes and the different types of assets by industry. Tourism investment in the Spanish table is presented for the tourism-characteristic industries by type of asset. Gross fixed capital formation related to tourism undertaken by the government is not included in either of the countries' tables. The tables of Norway, Spain and also France are not accompanied by any methodological description. The methodological comparison of the tourism investment tables of these countries and the Netherlands has not been facilitated by this fact.

However, despite inquiries at both UNWTO and the countries involved, I have not been able to collect examples of actually compiled tourism gross fixed capital tables from those or any other countries, other than the above mentioned Norway, Spain and France. Therefore, only the methods for the compilation of gross fixed capital formation used in Norway, Spain and France can be used as an inspiration to develop the methodology applied to the Netherlands.

5.4   The Dutch application

As part of the project to complete the set of tables recommended in the TSA: RMF for the Netherlands, I extensively researched and compiled this table for the Netherlands. I collected detailed basic data and constructed the tourism gross fixed capital formation table for the Netherlands. I have used, as much as possible, the methodology described in the TSA: RMF. The Netherlands is, as far as I know, one of the few countries with an extensive study to estimate gross fixed capital formation related to tourism.

5.4.1   Tourism industries in the Netherlands

The first approach, which corresponds with the first part of the tourism investment table of the TSA framework (TSA: RMF) (table A3.8 in appendix 3.1 of chapter 3), measures tourism investment by estimating total gross capital formation of the tourism characteristic industries. The industries which are identified as characteristic within the Dutch TSA are: hotels and similar, other accommodation, restaurants, bars and similar, railway transport, road transport, group transportation, taxi transportation, water transport (sea), water transport (river), air transport, transport supporting services, travel agencies and similar, equipment rental, film and video,

amusement and art, museums and libraries, sporting and other recreational services and gambling. For the classification of industries in the Dutch national accounts the industry classification is based on the "Standaard Bedrijfsindeling 1993 (SBI'93)". This industry classification in turn is based on the Statistical Classification of economic Activities in the European Community (NACE) and the International Standard Classification of Industry (ISIC).

Gross fixed capital formation is part of the Dutch national accounts and published on a regular basis. However, gross fixed capital formation is only published on a much more aggregated level, compared to gross fixed capital formation related to tourism as presented in this chapter. Therefore, information on gross fixed capital formation of the tourism characteristic industries presented in this chapter cannot be directly compared with other published information on gross fixed capital formation. The detailed information needs to be totaled. Gross fixed capital formation of the tourism characteristic industries, which is presented in table A5.1–A5.3 (in appendix 5.1), has been compiled specifically for this study.

Detailed information of each tourism characteristic industry is used to estimate its gross fixed capital formation. Most of the estimates are based on survey data complemented with information from annual reports and expert opinion. The TSA: RMF recommendations for tourism investment include a list of industries for which tourism investment should be estimated. This list of industries is located on a relatively detailed level, for which data is not always available in the Dutch case. This unavailability of data generally has two causes. In some instances, the industry classification does not contain the level of detail, and therefore data is not composed on a higher level of detail then available in the classification. Secondly, data has not been collected and composed on this high level of detail, even though the detailed classification exists.

The difference between the two approaches is that, in the first case the classification needs to be adjusted to contain more detail and then the micro data needs to be reclassified in accordance with the adjusted classification. Data collection may have to be adjusted as well, to make the data representative for this detailed level. In the second case, micro data is collected and composed with less detail than available in the classification. The classification does not need to be adjusted, in this case more detail has to be added in the data. The different data problems are illustrated with two examples.

Air passenger transport, for instance, can not be differentiated from air cargo transport because the industry classification does not include these categories separately, but only air transport (NACE 6200) is distinguished. On the other hand, the industries libraries (NACE 9251) and museums (NACE 9252) fall within two separate categories in the industry classification, but are not supported by data on this low level of aggregation. Data is only available on a more aggregated level,

namely on the level of libraries and museums (NACE 9250) together. These two examples illustrate that both the level of classification and availability of data can mean limitations for the compilation of tourism investment in the Netherlands. In table 5.1 industry categories are listed with an indication which parts are included, but should have been left out, for the calculation of gross fixed capital formation of the tourism characteristic industries. There are two possible reasons for inclusion described in the final column. The reason may have to do with limits posed by the classification, or with limits posed by the data where classification is not an issue.

Table 5.1
Detailed level of industry categories

	Part that should not be included	Reason of inclusion
Hotels and similar		
Other accommodation		
Restaurants and similar		
Bars		
Railway transport	Railway cargo transport	Limits in classification
Public road passenger transport		
Group transportation		
Taxi transportation		
Towing and ferry services (sea)	Towing and provisioning	Limits in classification
Passenger and ferry services (river)		
Air transport	Air transport of cargo	Limits in classification
Transport supporting services	Non-passenger related services	Limits in classification
Travel agencies and similar		
Equipment rental	Rental of non-tourism related equipment	Limits in classification
Film and video	Production and distribution of films and video	Limits in available data
Amusement and art	The excersice of art	Limits in available data
Museums, gardens (zoo) and libraries	Libraries	Limits in available data
Sporting and other recreational services	Professional sports	Limits in available data
Gambling	Lotteries	Limits in classification

The hotel and restaurant industries are typical tourism characteristic industries. Information on gross fixed capital formation of these industries is available on a detailed level, in accordance with TSA: RMF requirements.

The tourism characteristic industry transportation contains several sub-industries for different modes of transportation. Some modes of transportation do not have a separate category for the transportation of passengers and transportation of cargo and other transport related activities in the standard industry classification which is also used in the Netherlands. This means that for these industries, like rail and air transport, their will be an overestimation of tourism investment.

Within the industry equipment rental, different sub-categories are included, which belong only partially to the tourism characteristic industry. Included in the industry equipment rental, is the rental of recreation equipment like camping equipment

and ski's. However, within the selected sub-industries equipment is also rented out which has nothing to do with tourism, like renting out vans and cars for other than tourism purposes. These parts of industries can not be separated and can therefore not be excluded from the measurement. An overestimation of tourism investment is likely in this case.

Compared to the before mentioned industries, the estimation of gross fixed capital formation of the industry culture, sport and recreation (NACE 92) is relatively difficult. Information for this industry is collected on a relatively high level of aggregation. Annual reports improve the data availability to some extent but the subdivision of gross fixed capital formation into several sub-industries is based on a rough estimation.

5.4.2   Tourism investment of the government

Gross fixed capital formation related to the function of sport, recreation and culture of the government is included in the measurement of total gross fixed capital formation related to tourism. Information of the government is linked to the classification of function of government (Benelux classification (BNL))[7]. In the Dutch tourism investment table only the government function 'culture, sports and recreation' has been identified, to be included in tourism gross fixed capital formation. Three levels of government, i.e. national government, provinces and municipalities (including inter-communal associations) invest in culture, sports and recreation. Within the classification of functions of the government, tourism is distinguished separately, but within the Dutch data system this function is imbedded in other functions and can therefore not separately be identified.

As suggested in the literature (WTO, 1999, par. 4.90 and OECD, 2000, p. 33), gross fixed capital formation of the government in public infrastructure related to transport, has been excluded from the measurement of tourism gross fixed capital formation. In section 5.2.3 of this chapter it has been pointed out that there are difficulties with the inclusion of investment in transportation, as these investments are not exclusively used by, or mainly aimed at, visitors. In the Dutch case railway transport has been privatized and is therefore no longer part of government. Gross fixed capital formation in roads and road infrastructure, such as bridges and tunnels, constitute the majority of gross fixed capital formation of the government, which is excluded from the tourism investment table.

The data presented in tables A5.1, A5.2 and A5.3 in appendix 5.1 suggest that the government in the Netherlands only invests in tourism and recreation on a low level. The investments in tourism and recreation appear relatively small. However, this conclusion is not correct. The Dutch government awards investment grants for the establishment of gross fixed capital formation in different areas related to tourism. These investment grants are registered in the national accounts as capital

transfers, and are therefore generally not part of gross fixed capital formation of the government. Depending on which organization receives these capital transfers, the corresponding gross fixed capital formation may already be part of tourism investment. For instance, this is the case if the capital transfers have been received by tourism characteristic industries, or by a part of government that is included in the estimation. Even though these capital transfers of the government are in certain cases not part of tourism investment,[8] they can play a significant role in tourism related gross fixed capital formation. Future research should look into these capital transfers and the role they play in tourism investment.

5.4.3 Tourism dwellings

Tourism dwellings in the Netherlands generally consist of second homes and recreational homes. Time-share does not play a role in the estimation of investment in tourism dwellings in the Netherlands. The estimation of investment in second homes used for tourism purposes, poses several measurement problems. Firstly, the second homes used for tourism purposes have to be identified. Resident or first homes and second homes with a rental or business related purpose are part of the "usual environment" and are therefore excluded. Secondly, only if the second home is newly built or if the home had previously not been used for the purpose of tourism, is it an addition to tourism dwellings. If a second home, used for tourism purposes, is transferred from one owner to the next, while maintaining the purpose of tourism, only the cost of the transfer should be included. The data sources at Statistics Netherlands do not include information on the purpose for which a second home is used. Second homes with a tourism purpose can, therefore, not be distinguished. The estimation of gross fixed capital formation of second homes with a tourism purpose requires more research and is therefore not included in this chapter.

In the Netherlands, recreational homes are constructed with a specific recreational/ tourism purpose. In a separate column in the tourism investment tables of the Netherlands, an estimation of gross fixed capital formation for recreational homes can be found. Gross fixed capital formation in recreational homes is estimated, using the change in the number of recreational homes and the average cost of construction [9]. However, literature has made clear that recreational homes are inhabited on a permanent basis. This makes these homes residences and part of the "usual environment". Gross fixed capital formation of recreational houses has therefore been adjusted for the percentage of recreational houses which are permanently inhabited [10]. Transfer costs for the sale of a recreational home are not included in this estimation and are part of further research.

5.4.4 The results

In table A5.1, A5.2 and A5.3 (in appendix 5.1) gross fixed capital formation related to tourism is presented by industry and type of asset for the years 2001, 2002 and

2003. As expected tourism gross fixed capital formation mostly takes place in the tourism characteristic industries and in the transportation industry in particular. Railway transport covers most of tourism gross fixed capital formation within the transport industry. However, this gives a biased view as the railway mainly supplies to commuters. Gross fixed capital formation of the air transport industry is the second largest for all three years. It should be pointed out that the transportation of cargo is included in air transport, and therefore gross fixed capital formation associated with the transportation of cargo is included as well. These figures include an overestimation of tourism investment in the industry air transport.

Total gross fixed capital formation related to tourism constitutes approximately 6 percent of total gross fixed capital formation in the Netherlands for the years 2001–2002 and about 7 percent for the year 2003. Total gross fixed capital formation has shown a decline in the period 2001–2003 whereas total tourism gross fixed capital formation first declined in the period 2001–2002 where after it increased in the next consecutive period above the 2001 level. Gross fixed capital formation of the air transport industry was exceptionally large in 2003. This was mostly due to the purchase of airplanes.

Gross fixed capital formation related to tourism undertaken by the government, is related to the government function of sports, recreation and culture. The renovation and construction of national and municipal museums are a large part of government gross fixed capital formation.

The estimation of tourism investment for the Netherlands does not include non-produced non-financial assets. The importance of this memorandum item, presented in the tourism investment table recommended in the TSA: RMF, is acknowledged, but information on tangible and intangible non-produced assets is not readily available. Also not included is gross fixed capital formation of tourism specific capital goods, which are directly linked to the provision of services to visitors undertaken by industries other than the tourism characteristic industries or government. More research is needed to identify these specific investments and to ensure that there is no double counting.

5.5   *Summary and final remarks*

Tourism investment is interpreted in this thesis as consisting of gross fixed capital formation of the tourism characteristic industries, and gross fixed capital formation of touris specific capital goods, which are directly linked to the provision of services to visitors. Tourism specific capital goods can be acquired by different economic actors, but covers in particular tourism infrastructure expenditure by public authorities.

From an international comparison of methods used for the compilation of tourism investment tables, it appears that most countries compile a tourism investment table containing total gross fixed capital formation of the tourism characteristic industries. None of the other countries used the third method as explained in section 5.2.1 for the estimation of tourism gross fixed capital formation. Currently, the measurement of tourism gross fixed capital formation is not comparable and I do not see that a consensus will be introduced in the short term. There are still too many methodological and practical problems involved in the measurement of gross fixed capital formation related to tourism.

Tourism gross fixed capital formation makes up approximately 6 to 7 percent of the total gross fixed capital formation in the Netherlands [1]. Taking into account that a large part of tourism gross fixed capital formation is associated with transportation, the importance of this is put in perspective. The transportation industry, and especially railway transport, supplies a large part of her services to commuters and the transportation of cargo. This means that the estimated 6 to 7 percent tourism investment is also related to non-tourism purposes and therefore constitutes an overestimation.

For the compilation of a table on tourism investment data and classifications are required on a detailed level. A high level of detail is necessary to avoid extreme under- and overestimations. I recommend measuring tourism investment as the sum of gross fixed capital formation of the tourism characteristic industries and gross fixed capital formation of tourism specific capital goods by the government. The application of ratios to attribute parts of investment to tourism poses many methodological and conceptual problems. Furthermore, in the case ratios are used, international comparability and analysis of the development over time are significantly hindered. The research described in this chapter has tried to cover the methodology behind the compilation of the tourism investment table. This knowledge has been applied to the Dutch case.

To conclude, it has to be clear what gross fixed capital formation related to tourism should measure. The result has to meet a statistical need, to have meaning and to be useful. If international comparability is important to, for instance, benchmark the result of one country with another country, then the methodology should be adapted to this requirement. Data requirements, detailed versus aggregated for example, of certain methodologies can make them less applicable on an international level. Also, there are parts of tourism gross fixed capital formation methodology left, which need further investigation, such as the role that the general government plays in tourism investment and the extension of classifications.

Notes
[1] In chapter 6 of this study details on the estimation of tourism collective consumption are given.

2) Recall that the tourism characteristic industry is defined as an industry which has a direct relationship with the visitor in the provision of the tourism product.

3) The government consists among others of municipalities, provinces and the national authorities.

4) For further information see OECD manual (2000, p. 33). Here an extensive explanation for the exclusion of investment in transportation by the government from tourism investment can be found.

5) An institutional unit is said to be resident within the economic territory of a country when it maintains a centre of economic interest in that territory – that is, when it engages or intends to engage, in economic activities or transactions on a significant scale either indefinitely or over a long period of time, usually interpreted as one year (SNA93, par. 1.28).

6) More about the treatment of notional units can be found in SNA93 (par. 10.60, 10.69 and 10.123).

7) The BNL (Benelux) classification is used to classify the function of government into 12 main categories with category 13, 14 and 15 for specific transactions. Statistics Netherlands uses the BNL classification for the classification of national government statistics. There are bridge tables available linking BNL to COFOG.

8) Tourism investment is defined to include gross fixed capital formation of tourism characteristic industries and the government related to the function culture, sports and recreation.

9) This estimation is based on an average cost of construction mentioned on building permits for recreational homes.

10) In 2005 the Ministry of housing, spatial planning and the environment has undertaken a survey on recreational homes. One of the results of this survey was that 19 percent of the recreational homes are inhabited on a permanent basis.

11) Total gross fixed capital formation by type of asset is copied from table G 18 in the Statistics Netherlands national accounts publication (Statistics Netherlands, 2006). Cultivated assets, like trees and cattle, are not included.

Appendix 5.1

Table A5.1
Tourism investment for the Netherlands, 2001

	Gross fixed capital formation by tourism characteristic industries								Other industries	Total investment in tourism	Total investment in the economy
	Accommodation	Restaurants, bar and similar	Transportation	Transport supporting agencies and travel agencies	Equipment rental	Cultural, sporting and other recreational services	Tourism dwellings	Total tourism industries	Public administration		
A.1 Tangible fixed assets	mln euro										
Dwellings							100	100		100	27,189
Buildings	102	100	171	56	18	145		591		591	15,828
Ground, water and road construction work	13	1	1490	168	1	64		1,737		1,737	10,517
Transport equipment	4	23	1085	4	778	44		1,938		1,938	9,920
Computers	12	10	29	29	3	72		156		156	4,368
Machinery and equipment	55	68	218	78	10	45		475		475	14,050
Other tangible fixed assets (incl. transfer costs on land)	103	52	169	71	8	89		492		492	6,901
A.2 Intangible fixed assets	6	4	193	18		147		368		368	7,028
Total	294	259	3,355	425	817	606	100	5,855	20	5,875	9,5801

Note: The distribution of gross fixed capital formation by type of asset of the industry public administration is unknown therefore only a total is presented

Table A5.2
Tourism investment for the Netherlands, 2002

	Gross fixed capital formation by tourism characteristic industries								Other industries	Total investment in tourism	Total investment in the economy
	Accommodation	Restaurants, bar and similar	Transportation	Transport supporting agencies and travel agencies	Equipment rental	Cultural, sporting and other recreational services	Tourism dwellings	Total tourism industries	Public administration		
A.1 Tangible fixed assets	mln euro										
Dwellings							152	152		152	26,950
Buildings	144	96	195	38	9	137		620		620	15,903
Ground, water and road construction work	14	2	1,734	30	1	68		1,849		1,849	10,634
Transport equipment	5	22	797	5	683	41		1,552		1,552	9,101
Computers	15	11	35	26	3	68		157		157	4,027
Machinery and equipment	75	89	128	98	7	48		445		445	13,458
Other tangible fixed assets (incl. transfer costs on land)	85	85	53	57	6	85		371		371	6,561
A.2 Intangible fixed assets	6	4	205	13		148		375		375	7,513
Total	344	309	3,147	267	708	595	152	5,522	40	5,562	94,147

Note: The distribution of gross fixed capital formation by type of asset of the industry public administration is unknown therefore only a total is presented.

Table A5.3
Tourism investment for the Netherlands, 2003

	Gross fixed capital formation by tourism characteristic industries								Other industries	Total investment in tourism	Total investment in the economy
	Accommodation	Restaurants, bar and similar	Transportation	Transport supporting agencies and travel agencies	Equipment rental	Cultural, sporting and other recreational services	Tourism dwellings	Total tourism industries	Public administration		
A.1 Tangible fixed assets	mln euro										
Dwellings							118	118		118	27,020
Buildings	161	73	141	62	3	129		570		570	15,636
Ground, water and road construction work	13	1	1,150	488	0	61		1,713		1,713	10,675
Transport equipment	6	19	1,736	12	611	41		2,425		2,425	10,325
Computers	12	8	81	18	3	68		190		190	4,277
Machinery and equipment	71	81	138	81	6	46		423		423	12,749
Other tangible fixed assets (incl. transfer costs on land)	90	74	122	23	9	80		398		398	6,402
A.2 Intangible fixed assets	6	3	195	23		148		375		375	7,344
Total	359	260	3,563	706	633	573	118	6,211	20	6,231	94,428

Note: The distribution of gross fixed capital formation by type of asset of the industry public administration is unknown therefore only a total is presented

6. *Tourism collective consumption*

6.1 Introduction

Part of the production of general government cannot be directly linked to individual consumers or groups of consumers. Characteristically, this part is often not traded "on the market". The products concerned are known as "non-market collective services". These goods and services are "collectively" produced and primarily serve the general interest. Well-known examples of such services are (maintaining) the parliamentary system, many types of defense efforts, the construction and maintenance of dikes, and street lightning. As mentioned, especially in chapter 3, the TSA has acknowledged this, and has devoted an account to this, table 9 of its set of ten recommended tables (see especially in chapter 3).

The idea behind the *measurement* of collective consumption in relation to tourism, is that certain collective services are produced specifically for tourism. Tourism collective consumption consists of those non-market collective services, which unambiguously benefit visitors and/or those activities that serve them directly, i.e. the tourism industry. Collective services related to tourism include government security services around tourism areas and attractions, and the maintenance and conservation of natural and cultural areas. Those services are generally produced by the government of a country and create an environment in which tourism can flourish. Therefore, these services are (often closely) associated with tourism. However, in SNA93 the collective services are not allocated to any consumer, but are produced and consumed by the general government. The view that certain collective services should be attributed to tourism, as expressed in the TSA framework, is not in line with the SNA93 methodology.

The development of the TSA focuses on the measurement of tourism in its entirety in an economy. Besides the estimation of tourism consumption (and therefore production) of individual goods and services, tourism employment and tourism investment, the TSA framework also includes the measurement of collective consumption related to tourism. Clearly, the estimation of tourism collective consumption is part of the broader concept of tourism demand. This concept has already been presented in the discussion of the TSA framework and measurement of tourism investment (in sections 3.4.1 and 5.2.2 of this study)[1].

The TSA framework contains a methodology for the measurement of tourism collective consumption *in broad outlines*, but detailed guidelines have not been presented so far. Ultimately, these guidelines should result in international comparable statistics, but this is probably a long-term process. In this chapter I will

present an exploratory investigation into methods of measuring tourism collective consumption and in applications of this methodology.

I have subdivided the discussion of tourism collective consumption into a methodological and empirical part. In section 6.2, I will first address the methodological guidelines presented in the literature. One conclusion will be that certain parts of the methodology have not been given sufficient thought up to now. In that section I will also make a number of suggestions for improvement. Subsequently, I have used the case of the Netherlands for applying the methodology, thereby making use of the fact that extensive and detailed government data is available for the Netherlands. In section 6.3 the comments on and extensions of the methodological guidelines are applied to the Netherlands for the year 2002. Data sources and their limitations are described and results presented in this section. Unfortunately, only limited possibilities exist for country comparisons because, as far as I know, the Netherlands is among the first country to publish its results. Some remarks conclude this chapter in section 6.4 (Van de Steeg, 2006).

6.2 Types of collective consumption

Public authorities of countries normally undertake actions to create a favorable environment for the development of tourism (TSA: RMF, par. 2.80). They produce non-market collective services, such as maintaining order and security, and maintaining public spaces, which are fundamental to the basic structure and organization of a society. In fact, non-market collective services "are meant to provide the basic structure and organization of social life so that the national community may develop its various activities in harmony and according to the principles it has declared as its own" (TSA: RMF, p. 33).

Apart from measuring tourism collective consumption to underline the importance of these actions, this consumption is also part of the broader concept of tourism demand[2]. The provision of *individual* non-market goods and services to visitors, such as those provided by national parks, theatres and museums, is (already) included in visitor consumption as in-kind social transfers in table 4 of the set of TSA: RMF recommended tables (TSA:RMF, par. 4.68). However, non-market *collective* services have a number of characteristics differentiating them from market and non-market individual services which lead to a different treatment in SNA93 and the TSA framework.

The characteristics of non-market services are (this definition is both found in TSA: RMF, par. 2.77 and SNA93, par. 9.83): 'First, non-market collective services can be delivered simultaneously to every member of the community or to particular sections of the community, such as those in a particular region or a locality. Second,

the use of these services is usually passive and does not require the explicit agreement or active participation of all the individuals concerned. Finally, the provision of a collective service to one individual does not reduce the amount available to others in the same community or section of the community, if else there is no rivalry in acquisition'.

We have the following definitions:

An individual consumption good or service is defined as: "one that is acquired by a household and used to satisfy the needs and wants of members of that household. Individual goods and services can always be bought and sold on the market, although they may also be provided free, or at prices that are not economically significant, as transfers in kind. In practice all goods and most services are individual" (SNA93, par. 9.42).

A collective consumption service is defined as: "a service provided simultaneously to all members of the community or to all members of a particular section of the community, such as all households living in a particular region. Collective services are automatically acquired and consumed by all members of households in question, without any action of their part. Typical examples are public administration and the provision of security, either at a national or local level. Collective services are the "public goods" of economic theory. By their nature, collective services cannot be sold to individuals on the market and they are financed by government units out of taxation or other incomes" (SNA93, par. 9.43).

6.3   What should be measured?

In the tourism collective consumption table part of the TSA: RMF recommended set of tables, tourism collective consumption is measured by function and by level of government (see table A3.9 in appendix 3.1 of chapter 3). The expenditures of the general government are classified in categories of functions of government. This classification of functions identifies the objectives or purposes for which, in this case, the government engages in certain transactions. The classification is used to distinguish between individual goods and services and collective ones. The expenditures of the general government are used for the classification of the functions of government. The classification of government produced collective services is different from, for instance, the classification of enterprises in industries categories where the in-kind production is used. The reason for this is the way the production of the government is valued in the SNA93. Collective non-market production is offered at no charge or at less than economically significant prices. "Prices are said to be economically significant when they have a significant influence on the amounts the producers are willing to supply and on the amounts

purchasers wish to buy" (SNA93, par. 4.24C). For the valuation of the production of non-market services the total cost of production, including the consumption of fixed capital, is used. Any market output is a deduction in this calculation.

As a frame of reference, the TSA: RMF suggests using an *experimental* list of functions of general government at the national, regional and local level of government. Table 6.1 presents the experimental list of functions of general government, as suggested by TSA: RMF for the estimation of tourism collective consumption. This list is linked to the Classification of the Functions of Government (COFOG), (UNSD, 1999)[3]. The United Nations Statistical Division (UNSD) administers a number of classifications, such as COFOG, ISIC and CPC. The first column of table 6.1 contains 8 categories of functions of government, which can be directly related to visitors, the ninth category being a residual category (TSA: RMF).

Table 6.1
List of functions linked to the COFOG classification

	List of functions	COFOG classification
1	Tourism promotion	04.7.3 Tourism (CS)
2	General regulation of tourism	04.7.2 Hotels and restaurants (CS)
3	General planning and coordination related to tourism affairs	04.7.3 Tourism (CS), 08.6.0 Recreation, culture and religion n.e.c (CS)
4	Generation of statistics and of basic information on tourism	04.7.3 Tourism (CS)
5	Administration of information bureaus	04.7.3 Tourism (CS)
6	Control and regulation of establishments in contact with visitors (hotels, restaurants, recreation parks etc.)	04.7.2 Hotels and restaurants (CS)
7	Specific controls to residents and non-resident visitors: issuance of visas and controls at the border	03.1.0 Police services (CS)
8	Special civil defense services related to the protection of visitors	03.1.0 Police services (CS)
9	Other services	04.8.7 R&D other industries (CS)

As we shall see, it is sometimes not clear how these functions of government should be interpreted. Therefore, I shall discuss these functions below separately.

The first function, 'Tourism promotion', is a straightforward function of government and includes the stimulation and promotion of tourism in a country or region by the government.

The second one, 'General regulation of tourism', can be interpreted in various ways. The term can refer to regulatory and lawmaking qualities by a Ministry of Justice or by Parliament. This function, however, can also be interpreted in a more common way in terms of mostly directing tourism, which includes policy making on a general level, lobbying, et cetera. These activities are sometimes undertaken

by a specific government institution for tourism, like a ministry of Tourism, or spread over a number of government institutions, each of these conducting parts of this function (not that many countries possess a department or ministry of Tourism). In the latter case it may be difficult to make a distinction between the function 'General regulation of tourism', which is interpreted as being on a general regulatory and policy level, and 'General planning and coordination related to tourism affairs', which seems to be at the level of the actual execution of policy. In these cases the two functions are entwined and difficult to untangle. A case may be made to combine the two functions in one.

Clearly, many of the activities undertaken by the government in the area of tourism can be categorized under 'General planning and coordination related to tourism affairs'. This function also includes general administration and monitoring of tourism. Parts of the activities of a ministry of Tourism, for instance, belong to this function.

'Generation of statistics and basic information on tourism' is a function of general government which refers to carrying out surveys and compiling tourism statistics. Expenditures on information bureaus that are part of the government, belong to 'Administration of information bureaus'. The inspection of establishments, for example, is often assigned to specific government institutions. Such type of institutions also execute the next function 'Control and regulation of establishments in contact with visitors (hotels, restaurants, recreation parks, et cetera)'.

The function 'Specific controls to residents and non-residents visitors: issuance of visas and controls at the border' is a quite complex one. The payment for the issuance of visas is considered a tax in SNA93, or is treated as a purchase of services rendered by government (SNA93, par. 8.54 and par. 9.62; WTO, 2000a, 3.5.d). In both cases the issuance of visas does not constitute collective consumption and therefore should not be included in the measurement of tourism collective consumption. The second part of the function, border control, can be split in control of the crossing of persons and the crossing of goods (freight). Only the checking of passports by customs should be included in tourism collective consumption as the control on the crossing of goods mainly has a tax collection purpose and no specific tourism-related function.

In some countries, special civil defense organizations exist for the protection and guiding of visitors in specific circumstances or areas. These activities are categorized under the function 'Special civil defense services related to the protection of visitors'. However, in its current format this function is not generally applicable because the task of the protection of visitors is undertaken in some countries by the regular police and not by civil defense organizations. Police deployment during events, such as soccer matches and pop-concerts, could be included if function 8 is

extended to include police services. However, as pointed out in this section, this makes the classification of this function more complicated.

Functions of government related to transportation, like air space control and road control can be included as 'Other services'. These functions relate to characteristic industries and might have a considerable impact on tourism collective consumption.

The TSA: RMF proposes linking the above experimental list of functions to the international recognized Classification of the Functions of Government (COFOG, UNSD, 1999). This classification is designed to classify the different functions of general government into 10 main categories and several sub-categories.

Unfortunately, connecting COFOG to the functions as suggested by the TSA: RMF is less straightforward than it may seem. The COFOG classification includes only two specific categories for tourism as can be seen in table 6.1. COFOG category 'Tourism' (04.7.3) refers to 4 different functions listed in the TSA: RMF and so eliminates any detail available in the data. The COFOG category 'Recreation, culture and religion n.e.c.' (08.6.0) covers the activities of general government to facilitate sports, recreation and culture. This COFOG category is assigned to 'General planning and coordination related to tourism affairs' as tourism affairs is taken in its broadest sense, so including recreation and culture. However, the use of the COFOG code 08.6.0 may lead to overestimation, as the religion part in the COFOG category 08.6.0 ('Recreation, culture and religion n.e.c.') has little to do with tourism as such.

The problem of finding an acceptable methodological "anchor" may be even more serious. Most functions suggested by the TSA: RMF cannot be linked to a specific COFOG category at all. The suggested functions 'General regulation of tourism', 'Specific controls to resident and non-resident visitors: issuance of visas and controls at the border' and 'Special civil defense services related to the protection of visitors' do not belong to a matching COFOG category. These functions come under some very broad categories of functions. The latter two functions would be classified under 'Police services' and 'Civil defense' (COFOG category 03.1.0 and 02.2) respectively. As pointed out earlier in this section, extending the suggested function 'Special civil defense services related to the protection of visitors' does not improve the categorization of this function. In this case, the function would cover two COFOG categories, namely 'Civil defense' (02.2) and 'Police services' (03.1.0). These functions include all types of government tasks which have nothing to do with tourism, though. Concluding, allocating part of COFOG categories (thus) would require significant extra data and classification tools.

From table 6.1 we can conclude that the COFOG classification does not offer the level of detail reflected in the list of functions presented in the TSA: RMF. It depends,

naturally, on what objective the results serve, to determine if more detail is required. However, conceptually, it would be recommendable that the COFOG categories reflect the proposed measure of detail. Aggregation is always easier than providing more detail if data is only available on an aggregated level. Regarding the "strategy" to attain the level of detail proposed in the TSA: RMF, one option might be to extend the COFOG system with an additional level, i.e. by adding one additional digit. For instance, COFOG category 03.1.0 'Police services' could be extended with one digit becoming 03.1.0.1 'Passport controls at the border'.

The TSA: RMF suggests including a 'pro-memoria' item, which is 'intermediate consumption by the tourism industry'. This item is visible as a column in the tourism collective consumption table of the TSA: RMF recommended set of tables (see appendix 3.1 table A3.9 in chapter 3). The 'pro-memoria' item is added to the tourism collective consumption table to obtain information on services that benefit the tourism industry, but do not qualify as tourism collective consumption as these services are financed by the tourism industry themselves. Examples mentioned in TSA: RMF are tourism promotion and information bureaus organized and financed by the tourism industry. According to the TSA: RMF, these expenditures are part of the economic impact of tourism on the economy of a country or region and therefore may be of interest for analytical purposes, for instance, when measuring the efficiency of policies (TSA: RMF, par. 4.70).

From the description of this 'pro-memoria' item it is not clear how it should be interpreted. For instance, if these are expenditures of the tourism industry, then it could be assumed that these expenditures are already part of output of the tourism industry as these (expenditures) are included in the prices charged to visitors. Adding this additional column would in this case lead to double counting. If specific organizations are established and financed by the tourism industry for special purposes, like tourism promotion or the calculation of tourism statistics, then the fees or payment for this specific organization are part of intermediate consumption of the tourism industries. At this point it is not exactly clear how this 'pro-memoria' item should or could be included.

I have shown now that tourism collective consumption is measured, using functions of government. A set of functions, which is identified in the TSA: RMF, is linked to the international acknowledged Classification of Functions of Government (COFOG). However, government expenditure on tourism is not limited to tourism collective consumption. Subsidies and transfers are used as policy instruments by the government to ensure the production of certain goods and services, such as the maintenance of canoe and cycle routes and tourism promotion, taking place without performing these tasks herself. Parts of these government expenditures are related to tourism, but do not appear in the TSA so far. Further research and accompanying classification in this area is required.

6.4 The Dutch case

6.4.1 Compilation of tourism collective consumption in countries

A survey by the World Tourism Organization (WTO) shows that Hungary, Indonesia, Morocco, Peru, Philippines, Portugal and Thailand compile a tourism collective consumption table (UNWTO, 2005b). However, despite inquiries at both UNWTO and the countries involved I have not been able to collect examples of actually compiled tourism collective consumption tables from those or any other countries. Therefore no international comparison of methods for the estimation of tourism collective consumption could be made.

Related work has been done at Statistics Canada. An estimation of government revenue attributable to tourism has been measured for 1998 (Barber-Dueck and Zhao, 2003). However, in the Canadian paper only government revenue related to tourism, such as tourism tax and departure tax, is estimated and not tourism collective consumption.

6.4.2 Data sources

From the analysis of the various data sources we can conclude that, within the Dutch national accounts, the following institutions and organizations belonging to general government produce non-market output related to tourism:
– National government;
– Provinces;
– Municipalities (including inter-communal associations) [4];
– Non-profit institutions belonging to government.

Many different survey and administrative databases are available at Statistics Netherlands. The value of the tourism collective consumption is equal to the total of intermediate consumption, compensation of employees, consumption of fixed capital, taxes less subsidies on production related to tourism minus market output related to tourism within general government. In the System of National Accounts, the general government produces collective services and consumes these services at the same time, because it is not possible to allocate the use of these services to the different economic actors. As previously mentioned in section 6.2 of this chapter, collective services, such as streetlights, have characteristics which makes allocation of their use difficult and in many cases impossible. The TSA differs from SNA93 and ESA95, since the idea behind compiling a tourism collective consumption estimation is that these collective services can and should be allocated to tourism.

According to ESA95 the method for dividing government consumption in an individual and collective part should be based on the COFOG classification [5]. The split between individual and collective consumption is based on links between COFOG and the classification of functions used in the Netherlands, i.e. the so-

called Benelux classification[6]. The Netherlands is starting to use COFOG for the division between individual and collective consumption.

National government
Databases are available with detailed information on the budget and annual reports of the national government. The data is classified according to several classifications including a classification of the functions of government. The Benelux classification, which is used in the Netherlands to classify the functions of government, is linked to the internationally used COFOG. For the compilation of the tourism collective consumption table much detailed information is required. In some cases this meant that annual reports for the year 2002 had to be consulted to complete the information. This means that standard digital available data does not suffice with regard to the data requirements of this statistic. Manual and therefore expensive additional information is required.

In many cases the annual reports of the national government are compiled on an aggregated level, lacking sufficient detail. In these cases, information from annual reports has been combined with additional information, like hours worked and average wages, to come to a rough estimate. This mainly concerned the functions 'Generation of statistics and of basic information on tourism' and 'Control and regulation of establishments in contact with visitors (hotels, restaurants, recreation parks, et cetera)'.

Provinces
The expenditures of the provinces are classified by function using the Benelux classification. Detailed databases are available containing information from the annual reports of the 12 provinces. As for the national government, the required level of detail for the expenditures of the provinces was not always available in the databases. Consulting the paper versions of the annual reports yielded some detail, however not in all cases, and not always at a sufficient level. Because of lack of detail in the data, the estimation of tourism collective consumption of the provinces has been concentrated in the function 'General planning and coordination related to tourism affairs'.

Municipalities (including inter-communal associations)
Information from the municipalities consists of a sample of annual reports. Whereas the data of the national government and provinces is based on a census, the data of municipalities is based on a sample of about 600 annual reports. The data is placed in matrices linked with the functions of municipalities. Data on the inter-communal associations are also based on a sample of annual reports, collected in a database and linked to a classification of functions. Even though relatively detailed information on municipalities and inter-communal associations is available, the identification of individual, opposed to collective non-market output, proved

difficult for this part of government. The actual supply of recreational, culture and sporting services, individual non-market services, had to be distinguished from the administration and coordination of these services. Some assumptions have been made about which functions are collective and which individual and (therefore) not allowed to be included in the measurement of tourism collective consumption.

Non-profit institutions part of government
Non-profit institutions belonging to government also produce collective non-market output. Investigations have identified some non-profit institutions producing tourism promotion. In the first instance these non-profit institutions have been classified with the non-financial corporations, disqualifying them from tourism collective consumption. More research is needed to establish if these non-profit institutions should indeed be classified as non-financial corporations or should be reclassified as non-profit institutions belonging to government and therefore part of general government, placing them in the centre of tourism collective consumption.

Some final remarks are in order. In the future, data requirements of the tourism collective consumption table may be taken into account during data collection and data classification. Only when data is gathered and classified at a sufficient level of detail, can the table be compiled at the proposed level as suggested in the TSA: RMF experimental list of functions (see table 6.1). However, decisions should be made whether the funds and efforts spent to collect the data at this level of detail are spent well.

It also should be noted that the data collection method for general government has been changed for the year 2004 and onward [7]. Provinces and municipalities have to present their profit and loss statements in a pre-described matrix format. The advantage of this format is that it includes additional transactions. Also, in this case further research is needed to determine if and what the effects will be for the estimation of tourism collective consumption.

6.4.3   Results
For the Netherlands tourism collective consumption is estimated at 1.1 billion euro for the year 2002 (3 percent of total collective consumption). This is relatively small, compared to the internal tourism consumption of the Netherlands for the year 2002, which amounted about 31 billion euro (Hoekstra et al., 2006). In table 6.2 tourism collective consumption is presented for nine functions of government and for three levels of government. The main task of the general government for tourism is general planning and coordination of tourism activity. This idea is confirmed by the large amount allocated to this function, relative to other government functions.

Table 6.2
Tourism collective consumption by functions and levels of government, 2002

	National govern- ment	Pro- vinces	Munici- palities [1]	Total
	mln euro			
Tourism promotion	0	0	0	0
General regulation of tourism	–	–	–	–
General planning and coordination related to tourism affairs	134	67	828	1,029
Generation of statistics and of basic information on tourism	2	0	0	2
Administration of information bureaus	0	0	0	0
Control and regulation of establishments in contact with visitors (hotels, restaurants, recreation parks etc.)	20	0	0	20
Specific controls to residents and non-resident visitors: controls at the border	10	X	X	10
Special civil defense services related to the protection of visitors	0	0	0	0
Management and maintenance of nature and recreational grounds	0	0	31	31
Total tourism collective consumption	166	67	828	1,092
Total collective consumption	19,910	1,493	14,805	36,208
As percentage of total collective consumption	1	4	6	3

Source: Van de Steeg, 2006.

[1] Including inter-communal associations.

Municipalities (including inter-communal associations) are the main producers of general planning and coordination related to tourism affairs, with 6 percent of the total collective consumption of municipalities (including inter-communal associations). The management and maintenance of nature and recreational grounds are partly tourism collective consumption of municipal and inter-communal associations. This function is specific for the Netherlands and is included in the table, instead of other services found in the TSA: RMF proposed table 9. Besides planning and coordination, the national government also produces basic statistics and information on tourism and regulates and monitors establishments which come into contact with visitors. Provinces produce, and therefore consume, the smallest part of the tourism collective consumption (67 million euro). However, this is still 4 percent of the total collective consumption of the 12 provinces in the Netherlands.

'Tourism promotion' and 'Administration of tourism bureaus' is produced by non-profit organizations, classified as non-financial corporations. Collective consumption is not found with non-financial corporations. More research on these non-profit organizations is needed in the future.

There is no ministry of Tourism in the Netherlands. The 'General regulation of tourism', in the sense of such a ministry, is spread, in the Netherlands, over a number of government institutions at different levels and is more or less interwoven with the function 'General planning and coordination related to tourism affairs'. The expenditures of regulatory institutions, for instance the Ministry of Justice and Parliament, on tourism regulation cannot be separated in practice. Tourism collective

consumption on 'General regulation of tourism' can therefore not be estimated, which is shown by a dash in table 6.2. Any expenditure on 'General regulation of tourism' may be included in 'General planning and coordination related to tourism affairs'.

The conceptual difficulties with the measurement of 'Specific controls to residents and non-resident visitors: issuance of visas and controls at the border' have been explained in section 6.3. At the level of provinces and municipalities there cannot be any tourism collective consumption of this function (this is marked with an X in table 6.2). At the national government level 'Specific controls to residents and non-resident visitors: issuance of visas and controls at the border' is only included as far as it concerns the control on persons crossing the border because the issuance of visas is a tax or individual consumption (SNA93, par. 8.54 and 9.62; WTO, 2000a, 3.5.d). Based on information on the number of employees and wages, tourism collective consumption related to border control of persons is estimated to be around 10 million euro.

'Special civil defense services related to the protection of visitors' is a function identified in the TSA: RMF, which is not applicable to every country in its current format. The protection and guidance of visitors is one of the tasks undertaken by the police in the Netherlands, and not by civil defense organizations. As the function is formulated now, the estimated tourism collective consumption is zero.

In case the function 'Special civil defense services related to the protection of visitors' is extended to also include police services in this area, an estimation may be obtained. However, after that, some further decisions have to be made on which activities to include in the estimation. The collective consumption of police services is considerable. For example, an estimated 6 million euro was spent on direct police hours on soccer matches alone for the football season 2001–2002, where we should realize that in this estimation overhead costs, equipment and special allowances for police personnel are not taken into account. Only police deployment during soccer matches is included in this rough estimate and not police services during other events, such as pop-concerts, cultural and other sporting events and parades.

Although suggested as a 'pro-memoria' item by the TSA: RMF, I have left out the column 'intermediate consumption by the tourism industry' in table 6.2. Apart from previously mentioned objections (section 6.3), this column poses data problems as well. If specific organizations, established and financed by the tourism industry for special purposes, were to be included, then these organizations have to be identified. A branch organization, for instance, is financed by its members and some produce, among other things, tourism promotion or tourism statistics. However, if a branch organization is to be included, all members have to belong to

the tourism industry, which means that, say, catering companies or snack bars should be excluded, due to the nature of their production. Furthermore, only certain tasks of the branch organization should be included. At the moment, there are no data sources to readily produce such figures.

6.5 Tourism collective consumption revised

The current TSA framework, which is reflected in the TSA: RMF, is undergoing a revision. This revision is expected to result in a new manual referred to as TSA: RMF 2008 (UNSD et al., 2007). In TSA: RMF 2008 the guidelines for the measurement of tourism collective consumption have been changed (recall that in the current framework the COFOG classification is used). The revised framework will propose using a product classification, the Central Product Classification (CPC) [8]. At first this seems a good idea, because it avoids having to classify the functions of general government. Instead, the products of general government should be classified using the CPC classification scheme. Already, goods and services produced by general government are included in the supply and use tables. The goods and services produced by general government are apparently already classified by product category. However, it is the question whether this classification has taken place at such a detailed level as required for identifying tourism related collective consumption. This new approach has to be tested by putting this methodology in practice. From the results of these experiences, more fine-tuning can take place.

Despite the above proposed changes, the objections against assigning collective consumption to a group of consumers, namely visitors, still stand. The moment government collective consumption can be assigned to consumers, it stops being collective. The whole idea behind government collective consumption is that 'non-market collective services can be delivered simultaneously to every member of the community or to particular sections of the community, such as those in a particular region or a locality. Second, the use of these services is usually passive and does not require the explicit agreement or active participation of all the individuals concerned. Finally, the provision of a collective service to one individual does not reduce the amount available to others in the same community or section of the community, if else there is no rivalry in acquisition' (TSA: RMF, par. 2.77; SNA93, par. 9.83).

6.6 Summary and final remarks

The goal of this chapter was to discuss the methodology behind the measurement of tourism collective consumption and its application. The tourism collective consumption table of the TSA has received little attention internationally. Statistics

Netherlands is, to our best of knowledge, the first to compile this table. Including the estimation of tourism collective consumption in the TSA of a country contributes to the insight of the role of tourism in an economy.

In the Netherlands, total tourism collective consumption for the year 2002 is estimated at 1.1 billion euro. This comprises 3 percent of total collective consumption of the Netherlands. The main function of the government is general planning and coordination of tourism affairs (1,029 million euro). Municipalities are the main producers of tourism collective consumption, which comprises 6 percent of their total collective consumption. Provinces only produce 67 million euro in tourism collective consumption, which is a minimal amount.

On the methodological side, linking the functions of government to COFOG as suggested in the TSA: RMF is complicated, because COFOG does not offer the level of detail to reflect the proposed list of TSA: RMF suggested functions. Extending COFOG with an additional level (4 digits) is recommended to improve the usability of COFOG.

On the practical side, general government data do not offer the level of detail to classify individual transactions in a way that reflects the TSA: RMF suggested list of functions. This is difficult to change and adjust for existing databases. However, data collection and database construction could be adjusted to better fit the TSA data requirements in the future. We should add, of course, that it is currently unclear whether this can be accomplished at all and if so, if it is desirable in connection with the required funds and efforts.

Government expenditure on tourism does not only constitute tourism collective consumption, but also tourism-related subsidies received by corporations and transfers received by non-profit institutions. These expenditures have not been included in this investigation and are generally not included in the other TSA tables either. It is also possible to estimate the revenue of general government related to tourism activity. Government receives income related to tourism such as tourism tax, landing rights and docking fees for cruise ships. The total expenditure of general government related to tourism could be matched with this revenue related to tourism.

Notes

[1] We may recall that tourism demand consists of visitor consumption, tourism investment and tourism collective consumption, see TSA: RMF, par. 2.85 and 4.116.

[2] Recall that tourism demand consists of visitor consumption, tourism investment and tourism collective consumption (see sections 3.4.1 and 5.2.2 of this study).

3) Appendix 6.1 of this chapter includes the different COFOG categories mentioned in this chapter.

4) Intercommunal associations (local-authority cooperatives) or in Dutch 'Gemeenschappelijke regelingen' perform a large number of tasks for local government.

5) "For the goods and services provided by government units, the borderline between individual and collective goods and services is drawn on the basis of the Classification of the Functions of Government (COFOG)" (ESA95, 385).

6) The BNL (Benelux) classification is used to classify the function of general government into 12 main categories with categories 13, 14 and 15 for specific transactions. Statistics Netherlands uses the BNL classification for the classification of national government statistics. There are bridge tables available linking BNL to COFOG.

7) More information can be found in 'Regeling informatie voor derden' of February 6, 2003 of the Ministry of Internal Affairs (FO2003/U53097) (Regeling informatie voor derden, Staatscourant 21 februari 2003, nr. 37/p. 8).

8) In annex 5C of the provisional draft of the TSA: RMF 2008, a number of CPC, Version 2 categories is proposed to classify government production of collective non-market services related to tourism.

Appendix 6.1

Classification of the Functions of Government (COFOG)

03.1.0   Police services (CS)
– Administration of police affairs and services, including alien registration, issuing work and travel documents to immigrants, maintenance of arrest records and statistics related to police work, road traffic regulation and control, prevention of smuggling and control of offshore and ocean fishing.
– Operation of regular and auxiliary police forces, of port, border and coast guards, and of other special police forces maintained by public authorities; operation of police laboratories; operation or support of police training programs.
  Includes: traffic wardens.

03.2.0   Fire-protection services (CS)
– Administration of fire-prevention and fire-fighting affairs and services.
– Operation of regular and auxiliary fire brigades and of other fire-prevention and fire-fighting services maintained by public authorities; operation or support of fire-prevention and fire-fighting training programs.
  Includes: civil protection services such as mountain rescue, beach surveillance, evacuation of flooded areas, et cetera.

04.7.2   Hotels and restaurants (CS)
– Administration of affairs and services concerning construction, extension, improvement, operation and maintenance of hotels and restaurants.
– Supervision and regulation of hotels and restaurant operations (regulations governing prices, cleanliness and sales practices, hotel and restaurant licensing, et cetera).
– Production and dissemination of general information, technical documentation and statistics on hotel and restaurant affairs and services.
– Grants, loans or subsidies to support the construction, operation, maintenance or upgrading of hotels and restaurants.

04.7.3   Tourism (CS)
– Administration of tourism affairs and services; promotion and development of tourism; liaison with the transport, hotel and restaurant industries and other industries benefiting from the presence of tourists.
– Operation of tourist offices at home and abroad, et cetera; organization of advertising campaigns, including the production and dissemination of promotional literature and the like.
– Compilation and publication of statistics on tourism.

04.8.7   R&D other industries (CS)
– Administration and operation of government agencies engaged in applied research and experimental development related to other sectors.
– Grants, loans or subsidies to support applied research and experimental development related to other sectors undertaken by non-government bodies such as research institutes and universities.
– Includes: distributive trades, storage and warehousing; hotels and restaurants; tourism and multi-purpose development projects.

08   Recreation, culture and religion

08.6   Recreation, culture and religion n.e.c.

08.6.0   Recreation, culture and religion n.e.c. (CS)
– Administration, operation or support of activities such as formulation, administration, coordination and monitoring of overall policies, plans, programs and budgets for the promotion of sport, recreation, culture and religion; preparation and enforcement of legislation and standards for the provision of recreational and cultural services; production and dissemination of general information, technical documentation and statistics on recreation, cultural and religion.

7. *The institutional approach of tourism*

7.1 *Introduction*

In the previous chapters, the TSA framework, recommended in the manual TSA: RMF, has been presented. The TSA framework includes statistics on important areas of macroeconomic concern, such as tourism production and the share of tourism in GDP. The tables on tourism consumption (tables 1-4 of the TSA: RMF recommended framework) and tourism supply (table 5 of the TSA: RMF recommended framework) are linked in table 6 (Domestic supply and internal consumption) in the TSA framework. Tourism employment (table 7 of the TSA: RMF recommended framework) is strongly connected to the statistics on tourism supply, through compensation of employees, meaning the payment of employees. Compensation of employees is one of the variables presented in the confrontation of tourism consumption and tourism supply by industry and is, therefore, related to the various tourism industries. The non-monetary indicators (table 10 of the TSA: RMF recommended framework) contain information on tourism characteristics, such as occupancy rates, number of rooms available, number of arrivals and number of overnight stays. These non-monetary indicators can be related to well-defined monetary amounts such as tourism consumption and supply, as these non-monetary indicators often represent volumes. Tourism gross fixed capital formation and tourism collective consumption are not directly connected to tourism consumption and supply.

So, from the previous paragraph it appears that the accounts of the TSA framework are only partially interrelated. Tourism consumption and tourism supply are being confronted with each other, but tourism investment and collective consumption are not included in this reconciliation. The set of ten tables includes only a limited number of variables if compared to, for instance, the institutional sector accounts. Therefore, the standard TSA framework does not contain all relevant information policy makers or decision takers that a tourism-dependent country may want. Information on the ownership of establishments with a large stake in tourism, the manner of financing investment in tourism, the availability of work in the tourism industry, and taxes related to tourism are among the aspects which are *not* included in the current TSA framework. For instance, if tourism is financed by foreign capital, such as loans and equity, dividend and interest payments constitute a large outflow of money or leakage in an economy. Policy makers might want to take this leakage in the economy into account when planning for another hotel or casino with a large share of foreign ownership. Currently, interrelated accounts are not part of the TSA framework. The approach I will present in this chapter is a combination of the TSA and institutional sector accounts (recall that in previous

chapters institutional sector accounts have been presented as part of the central SNA93 framework).

Concepts, definitions and methodology of the TSA are developed, as with SNA93, to apply to different countries or regions. The impact tourism has on the economy of a country or region varies to a large extent. The previously presented cases of the Netherlands and Aruba illustrate the entirely different roles tourism can play in an economy. In cases where tourism plays a major role, having the right statistics at one's disposal is an invaluable asset. However, there is another point to be addressed. The rather loose structure of the TSA may not provide sufficient information for those situations where countries are heavily dependent on tourism for their survival. The ten tables of the TSA framework provide ample information for many policy problems, but there are cases where the framework is definitely inadequate. Countries with a large and developing tourism industry benefit from additional statistics on various aspects of their tourism industry. The statistics on tourism should preferably be interrelated, so that the effect of changes in one economic variable can be determined on another economic variable. The institutional approach to tourism which I will present in this chapter provides a first answer to the need for extensive statistics for certain countries such as Aruba. However, the institutional approach cannot be an answer for all types of countries and questions. For the Netherlands, for example, tourism is relatively small in economic terms and, therefore, the construction of an extension along the lines put forward in this chapter, may not pay off.

Therefore, in this chapter I present an institutional approach to tourism which will make the TSA framework more complete and integrated. The TSA framework shall be augmented with additional transactions and accounts. Indeed, an institutional approach to tourism is not a completely new idea as it has already been addressed in one of the earlier WTO manuals (1999, p. 91–93). In this manual some basic concepts of an institutional approach were introduced, such as the establishment of a 'tourism sector'. However, the approach has not been elaborated further in this manual (WTO, 1999) and any of the subsequent manuals. This means that an institutional approach has not been empirically investigated, neither have the proposed concepts and methodology, found in the WTO manual (1999), been firmly discussed and established. The introduction of a tourism sector is imperative for the institutional approach. An institutional sector is different from an industry and will be elaborated shortly.

The institutional approach refers to the use of institutional sector accounts in the TSA framework. Institutional sector accounts are part of the national accounts and employ so-called institutional sectors[1]. In the standard institutional sector accounts, tourism is partly and implicitly included in the non-financial corporations sector as hotels and restaurants, but the other four institutional sectors also contain some

tourism, such as tourism collective consumption in the general government sector.

Within the institutional approach I have added transactions which are not included in the TSA. The payment of interest and dividends are examples of transactions which are currently not included. In sectors, similar kinds of institutional units are grouped together. Corporations and households for instance are different from each other; their behaviour, objectives and functions vary (SNA93, par. 4.17). For the institutional approach to work, a tourism sector has to be created. In this sector institutional units dealing with visitors are grouped together and presented in direct relation with other institutional sectors of the economy. The rest of the world and institutional sectors, such as the general government and the rest of the economy, are incorporated in the institutional approach.

The sequence of accounts is introduced first, in paragraph 7.2. The set of ten TSA: RMF recommended tables are placed within the various accounts distinguished in the institutional sector accounts in paragraph 7.3. An outline of the institutional approach is given in paragraph 7.4. For the country of Aruba an institutional sector account has been developed with the tourism sector being made explicit. In paragraph 7.5 an institutional approach of tourism is presented for this island state. Finally, in paragraph 7.6 the link between environmental accounts and the TSA is discussed. Some final remarks conclude this chapter.

7.2 TSA and the sequence of accounts

The variables measured in the TSA have their place in the sequence of accounts. In fact, the tables of the TSA framework cover part of the transactions presented in the sequence. In table 7.1, the tables of the TSA are linked with the various accounts of the institutional sector accounts. This is to show which variables are part of the TSA and which new variables are introduced.

The production of tourism goods and services is included in the production account of the sequence of accounts. Compensation of employees, which is generated in the production of tourism-related output, and taxes minus subsidies on production and imports, are found in the generation of income account of the sequence of accounts. In the TSA framework, these transactions are in the tables which present the production for visitors (table 5) and part of the table confronting domestic supply with internal consumption (table 6). Imports of goods and services for the benefit of visitors (table 6) are placed in the external account of goods and services.

The TSA tables on visitor consumption (tables 1 to 4 and part of table 6) and tourism collective consumption (table 9) are included in the use of income account of the

sequence of accounts. Tourism investment (table 8) is part of total gross fixed capital formation of a country, which is a transaction that is found in the capital account. The non-monetary indicators (table 10) cannot be linked to any part of the sequence of accounts.

In table 7.1 the TSA framework, with the supply by the tourism industries and consumption by visitors in terms of goods and services, is presented. Supply and use specific to tourism, are established as the core of the TSA framework. Tourism investment and tourism collective consumption are not directly linked with these core tables. In the previous chapters we have seen that these tables are not part of visitor consumption as defined by the TSA: RMF. At the moment, these tables still are at an experimental stage.

The tourism dimension in the allocation of primary income account and the secondary distribution of income account is not measured within the TSA framework. Property income, current taxes on income, wealth, et cetera, and current transfers are among the transactions not taken into account in the TSA framework.

Table 7.1
The sequence of accounts linked with the TSA tables

Accounts	Tables
Production account	5 & 6
Generation of income account	5 & 6
Allocation of primary income account	
Secondary distribution of income account	
Use of income account	1-4 6 & 9
Capital account	8
Financial account	

7.3 The tourism sector

So far, the production of goods and services in the TSA framework has been presented by industry. The activity of the establishment or the majority of the establishment determines in which category of industries the unit concerned is classified. We recall from appendix 1.1 of chapter 1, that in SNA93 an establishment is defined as 'an enterprise, or part of an enterprise, that is situated in a single location and in which only a single (non-ancillary) production activity is carried out or in which the principal productive activity accounts for most of the value added' (par. 5.21). Classification of industries takes place at the establishment level, which is often located on a lower level of aggregation then the enterprise. At the establishment level not all decisions are taken and books are not always kept. Examples of establishments are the various outlets of small kiosks at public places such as railway stations.

The institutional approach entails the establishment of institutional units. SNA93 defines (see also appendix 1.1 of chapter 1) an institutional unit as 'an economic entity that is capable, in its own right, of owning assets, incurring liabilities and engaging in economic activities and in transactions with other entities' (SNA93, par. 4.2). An institutional unit engaged in production is an enterprise (SNA93, par. 5.1). The institutional unit level is different from the activity level, which is used for defining industries. At the institutional unit level, decisions are made and financing are arranged, i.e. at the corporation or enterprise level.

For the application of the institutional approach on tourism an institutional unit for tourism, i.e. a 'tourism sector' has to be established. The tourism sector is different from the sectors already defined in the institutional sector accounts of SNA93, such as the household, government and financial corporations sector. In satellite accounts an institutional sector of characteristic producers can be established (SNA93, par. 21.106). The institutional units can be regrouped in a sector of characteristic producers on the basis of a main productive activity. In this way, establishments producing for tourism are regrouped into a tourism sector. In paragraph 7.5, the case of Aruba will illustrate the intricacies in the creation of the tourism sector.

Apart from the introduction of a tourism sector, a government sector related to tourism can also be included in the institutional approach to tourism. This differs from the extension suggested by the WTO (1999). The institutional approach has not been addressed in the TSA: RMF.

Looking ahead to the next chapter, I should note here that input-output analysis does not particularly benefit from an institutional approach. Input-output modelling is mostly based on supply and use data, which encompass the production account and the generation of income account. An extension of the TSA towards a so-called functional analysis would disaggregate supply and use data for homogeneous units which undertake only one activity. This analytical unit or so-called "homogeneous production unit", is the basis for analysis, even though it does not always have to be observable (WTO, 1999, par. 5.73). The institutional approach takes a different turn, and aggregates information to the level of corporations, which may or may not be equal to an establishment. In the interest of producing a detailed and very precise input-output table, the level of aggregation should be located at a extremely detailed level, such as the unit of activity instead of the higher aggregation level of establishment.

7.4   *The institutional approach*

As we have seen, the TSA covers only part of the sequence of accounts; the TSA framework does not include the generation of income account, the allocation of

primary income accounts, and the financial account. Other accounts, like the capital account, are only partly covered. For certain policy purposes, such as policy associated with the balance of payment, this is insufficient information and it should be extended, to include more transactions and interactions with, for instance, the rest of the world.

The introduction of an institutional approach broadens the scope of the transactions considered within the TSA framework. The additional accounts and the transactions they "represent", covered in the institutional approach, complement our insight in the allocation of money generated by the tourism sector. Also certain macroeconomic indicators, such as disposable income, saving, and the net lending or borrowing position, can be calculated specifically for the tourism sector. In the institutional approach, interactions between the tourism sector and other sectors of the economy and the rest of the world are made explicit. Information on the different sectors and the rest of the world is presented in a consistent way.

The allocation of primary income account is the first account not addressed in the current set of ten tables of the TSA framework. This account includes the receipt of compensation of employees by households, the receipt of taxes on production and imports less subsidies by general government and the payment and receipt of property income, like interest and dividends, by all institutional units and the rest of the world. Property income is paid and received abroad and domestically. For a proper insight into tourism and its impact on an economy, knowledge about how tourism is financed, is important. Some part of tourism may be financed with loans or stock, with domestic or foreign capital. The use of foreign capital has consequences for the rest of the world account and the balance of payment of a country.

The secondary distribution of income account contains the transactions associated with social contributions and benefits, current taxes on income, wealth, et cetera, and other current transfers. The transfer of remittances of foreign labourers to their native country is included in this account. Estimating current taxes on income, wealth, et cetera, provides valuable information on the payment of, for instance, profit tax by the tourism sector. The competition between tourism sectors in different countries or regions is relatively competitive. This is an important variable for policy makers to take into account when determining the tax level.

Certain transactions have an implicit link in their cause and effect mechanisms. Property income and gross fixed capital formation are two such transactions in the sequence of accounts. When savings of an institutional sector are not adequate to cover the gross fixed capital formation of the sector, the sector has to acquire loans or place additional stock to finance these investments. In future the expected payments of property income are likely to increase, because new loans or equity need to be serviced. The payments of interest and dividend are expected to rise. It

is possible that in countries, especially developing countries, tourism investment is paid with foreign loans or equity. The lack of domestic resources for financing investment means that the country will face a continuous outflow of hard-earned money. This could be the start of a vicious cycle, from which it may be difficult to escape.

Apart from incorporating additional transactions into the TSA framework, the institutional approach also shows interactions with other institutional sectors and the rest of the world, which are included in the institutional sector accounts. The sector 'general government related to tourism' - which could be included as a separate institutional sector - shows the costs and benefits of tourism for the general government. The benefits for the general government from tourism consist of taxes on production and imports and current taxes on income, wealth, et cetera. Examples of these taxes are tourism taxes, profit taxes and VAT paid by visitors. One of the instruments governments use for their tourism promotion are the so-called tax holidays. These "holidays" can include various facilities, such as exemptions from the payment of profit taxes, taxes on dividends, and import duties. The costs of tourism for the general government include the production of non-market collective goods or tourism collective consumption, and the payment of subsidies, social transfers in kind, and current transfers. Governments can also be involved in the construction of tourism investment or can give investment grants. Investment and investment grants are part of the capital account. The capital account closes with a balancing item, showing a net surplus or deficit of the government related to tourism.

In the financial account, the payments and receipts of the non-financial transactions taking place in the previously mentioned accounts, can be observed. Changes in share holdings and loan portfolios indicate the manner of financing the non-financial transactions. This is also shown in relationship with the outside world in the accounts of the rest of the world.

The institutional approach also shows the interrelations between the domestic sectors and the rest of the world. This interrelation can be made explicit for the tourism sector. Leakages of the domestic economy to the rest of the world can thus be traced back and analysed. Examples are payments of property income, such as interest on foreign loans and dividends on stock owned by non-residents, and hiring of expatriate labour. These leakages may be considerable and policy making and decision taking benefit from improved information and insights.

7.5 *Application of the institutional approach*

In this paragraph the institutional approach is applied to Aruba (Van de Steeg, 2005c). The TSA of Aruba, compiled for the year 1999, gives a quantitative

illustration of the institutional approach applied to tourism. Table A7.1 (in appendix 7.1) contains an institutional sector account with three institutional sectors and the rest of the world. The institutional sectors are the tourism sector, the general government related to tourism sector and the rest of the economy.

The sector tourism comprises the activities detailed in table A4.4 of appendix 4.1. The production and generation of income account match the totals presented in this table. The other accounts, from the allocation of primary income account up to the capital account, only contain the transactions associated with the characteristic activities. This means that from the allocation of primary income account and, furthermore, the activities retail trade, telecommunications and photographic activities are excluded. The reasoning behind this is that characteristic activities are typically present in the economy, due to tourism. Without tourism, tourism characteristic activities would be available in smaller numbers or not at all. Because characteristic activities depend heavily on tourism, these activities are extremely interesting in the discussion of the role of tourism, now and in the future.

I have classified the different departments, sections and units of the Aruba general government using the Classification of the Functions of Government (COFOG) (UNSD, 1999). The COFOG categories[2] 'hotels and restaurants' and 'tourism' have been identified as part of tourism collective consumption[3]. The other functions recommended by the manual TSA: RMF[4] have not been estimated for Aruba (TSA: RMF). Tourism tax received by general government is included as a resource for general government related to the tourism sector[5].

The total economy depicts the total of the national economy and is therefore an aggregation of the three sectors. The fourth column in table A7.1 shows the total economy of Aruba. The rest of the world shows all the transactions of Aruba with the rest of the world. All transactions with the rest of the world are to be found in the fifth column.

Consumption of fixed assets is calculated for all activities separately and included here, so value added gross and net are available. Taxes and subsidies on production and imports are a use for the tourism sector and a resource for the general government related to tourism sector. The majority of other taxes minus subsidies on production, consist of casino tax. Output of 'general government related to tourism' is imputed. The imputed output is equal to intermediate consumption plus compensation of employees, so operating surplus is zero. In the 'use of income account', this imputed output of 'general government related to tourism' is consumed again by the general government as government final consumption expenditure. The 'rest of the economy' contains all transactions not included in the 'tourism sector' and 'general government related to tourism sector'.

Other than property income presented in the regular publication of the national accounts of Aruba, property income is split in property income paid and received abroad and domestically. However, it should be taken into account that it is likely that dividend payments are underestimated. Often dividend payments are not included in annual reports, which are the main sources for economic statistics, or dividend payments are not published in the year they refer to.

Investment in tourism can be financed with loans or stock, and with domestic or foreign capital. The tourism sector is borrowing from other domestic sectors or from the rest of the world to finance its investments. Net savings plus consumption of fixed capital of the tourism sector only cover half of the gross fixed capital formation of the sector. The other half is borrowed from other sectors or the rest of the world.

General government related to tourism shows a surplus (see table A7.1 last row). However, this picture does not show the entire truth. Not included in the general government related to tourism, are the expenditures on collective services, such as maintaining order and security and the maintenance of public spaces, which are also used and enjoyed by visitors. The inclusion of these services is advocated in the TSA: RMF. However, it is difficult to determine the exact amount of these services enjoyed by tourism. Only expenditures of general government directly linked to tourism, are included in the general government related to tourism sector. The lack of domestic resources in Aruba means that money will continue to flow out of the country.

Current taxes on income, wealth, et cetera are a use for the tourism sector and a resource for the general government related to tourism. The majority of the current taxes paid by the tourism sector are profit taxes. About 10 percent of operating surplus/mixed income of the tourism sector is paid in taxes. This relatively low percentage might be due to the tax holidays for the construction of certain hotels, restaurant and recreational facilities. Tax holidays include the exemption for the payment of profit tax, dividend tax, import duties on construction material and property tax. The Aruba government used the tax holiday facilities mainly to promote the construction of hotels. According to government records almost all hotels or hotel extensions have been given tax holidays since 1986. In January 2003 the Aruba government decided that tourism does not need further promotion with this instrument (i.e. tax holiday facilities). The philosophy behind the decision could be that hotel organizations will choose Aruba anyway because of its attractiveness for visitors. On the other hand, the government budget deficit could also play a role. This end to the system of tax holidays does not necessarily mean that government income will increase, because the effective tax rate is still minimal. Aruba government sources say that instead of the tax holiday, hotels have to pay a rate of 2 percent. It appears the government of Aruba is afraid that large international

hotel chains might abandon the island, leaving behind empty hotels. The recent expansion of the Marriott Hotel will not help to ease the situation.

The current transfers included for the tourism sector cover mostly insurance premiums as a use and insurance claims as a receipt.

Gross fixed capital formation includes consumption of fixed assets. Airport and hotel construction cover over half of investments. Also included in gross fixed capital formation are new cars for the car rental companies and investments in timeshares sold to non-residents. The buying of timeshare, and second homes, for that matter, by non-residents, requires special treatment in national accounts. The reason is that, according to the accounting rules in the System of National Accounts, non-residents cannot own land or real estate abroad. For accounting purposes a notional non-financial company is created which owns the land or real estate and the non-resident owns all the shares. For the national economy, the investment is located in the non-financial sector, or in this case in the tourism sector, and in the financial account (which is not published by CBS of Aruba) a direct investment from abroad is viewed (SNA93)[6]. Investment in timeshares by non-resident visitors amounts to Afl. 82.02 million or 36 percent of the investment of the tourism sector.

An estimated 17.8 percent of gross domestic product (GDP) is produced in relation with tourism in Aruba. The following rows in table A7.1 present the components of value added. Compensation of employees generating tourism supply totals at Afl. 363.77 million or over 20 percent of total compensation of employees in the Aruba economy. Total gross operating surplus/mixed income of tourism supply comes to Afl. 181.34 million.

7.6   Sustainable tourism

This chapter is about extending the TSA framework for countries which require more information for policy purposes. Most policy issues involve finding answers to questions on what is best for the country, the economy, or the population, not necessarily in that order. This basically means making the right choices for the wellbeing of current and future generations. Sustainability is the key-word here. SNA and the extension previously presented, are mostly concerned with economic-financial issues, such as the distribution of money in society. However, there is more to "wellbeing", as already mentioned in the introductory chapter. SNA is being extended to include more and more aspects of wellbeing. One of the directions in which satellite accounts have developed involves the environmental accounts. In the introduction I mentioned research concerned with the connection of tourism (TSA) to environmental accounts.

The SNA has proven to be a valuable common framework between tourism and the environment. There are several studies which investigate the link between the TSA and environmental accounts. One environmental area that is particularly relevant for tourism is water. Good water quality is essential for swimming and other water recreational activities. On the other hand, tourism may cause water pollution and exhaust the water reserves of a country. The so-called water accounts form one of the areas within environmental accounting in which much progress has been made during the last years, resulting in "Integrated Environmental and Economic Accounting for Water Resources", see UNSD, 2006. The water accounts provide a conceptual framework for organizing hydrological and economic information in a coherent and consistent framework. The water accounts measure different types of water usage and pollution by various categories, such as industries and sectors in physical and monetary terms. Because both the TSA and water accounts are based on SNA, common concepts, definitions and accounting rules are used, which facilitate the linking of these two frameworks.

Diaz (2006), for instance, has studied the effect tourism has on water use in the Dominican Republic. Diaz's paper shows that the two frameworks can be folded into a set of tables which identify types of water consumption and pollution by various categories of industries, including tourism characteristic industries (such as hotels), in monetary and physical terms. However, Diaz does not account for connected and non-specific products, such as banking services and home decoration goods. Therefore the full share of tourism in the water accounts is not being measured. To my knowledge, a fully implemented table has not yet been developed, which means that at present it is difficult to say if the framework really is appropriate when empirical data have to be accommodated.

Other work is being done in Canada (Barber-Dueck and Kemp, 2006) and Italy (Costantino and Tudini, 2005). The latter authors introduce in their paper an "Accounting Framework for Ecologically Sustainable Tourism" (AFEST). With the AFEST framework, Costantino and Tudini want to bring together tourism and sustainability, by employing pressure indicators. The pressures that tourism put on the environment are outlined by emissions and usage. The AFEST framework combines economic, tourism and environmental indicators. The framework consists of the Integrated Environmental and Economic Accounts 2003 (SEEA2003), augmented with elements of the Tourism Satellite Account (TSA) and the European System of Environmental Pressure Indices (ESEPI). The TSA and SEEA2003 are both based on the System of National Accounts, ESEPI, however, involves a different procedure. This system of pressure indices takes human action at large into account and is not limited to economic activities, such as in the System of National Accounts. For instance, the ESEPI includes recreational activities such as hunting. If no explicit expenditures, such as rental of shooting equipment, transportation or guides, are involved, this environmental pressure is not picked

up in economic statistics, such as the national accounts and TSA. These kinds of environmental pressures are called 'informal activities' and Costantino and Tudini exclude them from the AFEST. The input from ESEPI in the AFEST presented tourism environmental pressure indicators. The tourism environmental pressure indicators are, for example, the use of mineral oil products, water, natural gas, air emissions, water emissions and waste.

Waste or in ESEPI terms 'residual generation by tourism' is not estimated. At the end of paragraph 2.3 of their paper, Costantino and Tudini seem to conclude that products in the TSA only constitute services. In my view, this is not entirely correct; the characteristic products are indeed services. However, visitors also consume goods (connected and non-specific products) which Costantino and Tudini do not consider. Clearly, using a service does not generate waste in the same way as using a good. Therefore their item 'residual generation by tourism' cannot be implemented easily. In my view, choosing this direction is not preferable because I consider goods to be included in the TSA and therefore residual, such as waste generated by visitors, can be accounted for.

The SEEA2003 is based on monetary statistics complemented with physical data, such as assets of natural resources and flows of residuals like waste. AFEST results from taking the SEEA hybrid supply and use model, in combination with key inputs from the TSA: RMF and ESEPI statistical framework. Tourism specific economic aspects are applied to the SEEA provided by the TSA and environmental aspects from ESEPI. The input of the TSA is mainly the breakdown of products and activity categories relevant to tourism. SEEA is extended to include tourism activities which are found in the TSA. A feasibility study of an AFEST has been produced for Italy. This feasibility study, however, makes use of the Italian National Accounting Matrix including Environmental Accounts (NAMEA). In this application the ESEPI pressure indicators are not being used. Unfortunately, no compiled tables have been included in the paper, so the usefulness of the framework cannot really be tested.

The way Costantino and Tudini have formulated the framework, however, is appropriate in the sense that an integrated option has been chosen. All in all, I am less convinced by the Environmental Pressure Indices, because I have difficulty locating these in the schematic diagram (Table 5.3 in their paper). In the schematic diagram usage of natural resources and residuals (i.e. waste) can be found in the same way as in the environmental accounts. I have not been able to locate the specific environmental pressure indicators. In my view, extending the SEEA with specific detail to visualize tourism activities and products would suffice. I would have liked to have seen a practical application of the framework. In my opinion, a compilation experience is more educational, when one is thinking about systems and frameworks.

7.7   *Review of the approach*

The institutional approach constitutes a unique source of information on the role of tourism in an economy. It provides a quantitative description of the flow of money within the nation, and its relation to the rest of the world. In a single system, the institutional approach supplies information on major economic transactions and relations between economic actors, such as the general government and the rest of the world. The institutional approach applied to Aruba therefore provides additional insight in the role of tourism in the Aruba economy. The payments of taxes on production and current taxes on income, wealth, et cetera, and property income, but also the receivables of subsidies and property income, have been made visible. These transactions are located in the sequence of accounts (see also chapter 2). However, the sequence of accounts of Aruba is not complete. The financial account is not produced and, therefore, the financial flows associated with tourism are not visible in this example.

In the case of Aruba, a tourism sector, the government related to tourism sector and the rest of the economy sector have been distinguished, next to the rest of the world. The effects of the tourism sector on the rest of the world account can be viewed directly and analysed. Not only the significant exports related to tourism can be viewed, but also the large outflows of property income. The number of sectors in the example can be extended to include a household sector. Earnings from working in the tourism sector and money transfers to families abroad can be made explicit in this manner.

The institutional approach opens the door towards a NAM or even a SAM, by incorporating the supply and use of tourism goods and services by the tourism industry, and the receipt and payment of other transactions by the tourism sector and other institutional sectors and the rest of the world[7]. Other transactions such as property income, and current taxes on income, wealth, et cetera, can also have certain connections, which are made explicit in a NAM or SAM. Also input-output approaches, the subject of the next chapter, now come within reach.

The question of the sustainability of tourism is relevant, but difficult to answer. The institutional approach does not supply answers on environmental sustainability, connecting the framework with SEEA would help for this. However, the institutional approach can be a valuable tool in determining economic sustainability within a country or region. The institutional approach provides information on the costs and benefits of tourism for different stakeholders, such as the government and the rest of the economy, in the economy. The TSA institutional framework can be adjusted in the number of institutional sectors or accounts to be included, to supply the required information. In section 7.6 I have presented my views on extensions of the TSA in the direction of economic-ecological modelling.

Notes

[1] The institutional sectors are (see chapter 2): non-financial corporations, financial corporations, general government, households and non-profit institutions servicing households such as churches and sporting clubs.

[2] The COFOG category 'hotels and restaurants' (04.7.2 CS) consists of: Administration of affairs and services concerning construction, extension, improvement, operation and maintenance of hotels and restaurants; Supervision and regulation of hotels and restaurant operations (regulations governing prices, cleanliness and sales practices, hotel and restaurant licensing, et cetera); Production and dissemination of general information, technical documentation and statistics on hotel and restaurant affairs and services; Grants, loans or subsidies to support the construction, operation, maintenance or upgrading of hotels and restaurants (UNSD, 1999).

'Tourism' (04.7.3 CS): Administration of tourism affairs and services; promotion and development of tourism; Liaison with the transport, hotel and restaurant industries and other industries benefiting from the presence of tourists; Operation of tourist offices at home and abroad, et cetera; Organization of advertising campaigns, including the production and dissemination of promotional literature and the like; Compilation and publication of statistics on tourism (UNSD, 1999)

[3] See also the discussion in chapter 6.

[4] See for more information on tourism collective consumption, chapter 6 of this study.

[5] A more extensive study on income of general government related to tourism can be found in Barber-Dueck and Li (2003).

[6] The estimation of the amount of investment of non-residents in timeshare is made by deducting the cost of the room from the room sale. For the timeshare resort is the sale of the timeshare an output while for the buyer, resident or non-resident, it is an investment for the complete amount of the timeshare sale. Due to the creation of the notional non-financial company only the timeshare room margin is taken as investment for the year of sale. As the construction has already taken place there is only a transfer of ownership for the cost of sale from the timeshare resort to the notional entity or for residents to the household sector (WTO, 1995, p. 80).

[7] Information on the NAM can be found in section 2.4 and on the SAM in section 2.5.

Appendix 7.1

Table A7.1
Institutional sector account for inbound tourism, 1999

	Inbound tourism	General Government related to tourism	Rest of the economy	Total economy	Rest of the World
	mln Afl				
External Account of Goods and Services					
R Imports of goods and services					2,610.20
U Other exports					1,173.09
Tourism exports					1,292.39
Production Account					
R Output	1,128.43	32.25	4,413.99	5,574.67	
Taxes on products			245.37	245.37	
Subsidies on products			–6.91	–6.91	
U Intermediate consumption (excl. FISIM)	562.73	25.79	2,140.80	2,729.32	
Value added, gross/gross domestic product	565.70	6.46	2,511.65	3,083.81	
Consumption of fixed capital	72.51	0.11	240.46	313.08	
Value added, net/ net domestic product	493.19	6.35	2,271.19	2,770.73	
Generation of Income Account					
R Value added, net/ net domestic product	493.19	6.35	2,271.19	2,770.73	
U Compensation of Employees	363.77	6.35	1,403.25	1,773.37	1.30
Taxes on production and imports	39.69		243.49	283.18	
Subsidies	–0.08		–6.83	–6.91	
Operating surplus/mixed income, net	89.81	0.00	631.28	721.09	
Allocation of Primary Income Account					
R Operating surplus/mixed income, net	89.81	0.00	631.28	721.09	
Compensation of Employees			1,773.37	1,773.37	1.30
Taxes on production and imports		39.63	243.55	283.18	
Subsidies		–0.08	–6.83	–6.91	
Property income abroad	8.44		78.56	87.00	240.84
Property income domestic	2.45		562.69	565.14	
U Property income abroad	53.14		187.70	240.84	87.00
Property income domestic	45.38	0.60	519.16	565.14	
Primary income/national income, net	39.12	39.55	2,575.76	2,616.89	
Secondary Distribution of Income Account					
R Primary income/national income, net	39.12	39.55	2,575.76	2,616.89	
Current taxes on income, wealth, etc.		9.12	316.12	325.24	
Social contributions			388.01	388.01	
Social benefits (in cash)			238.22	238.22	21.40
Other current transfers	2.60		284.31	286.91	67.09
U Current taxes on income, wealth, etc.	9.12		316.12	325.24	
Social contributions			388.01	388.01	
Social benefits (in cash)			250.92	250.92	8.70
Other current transfers	2.80	0.12	300.58	303.50	50.50
Disposable income, net	29.80	48.55	2,546.79	2,587.60	
Use of Income Account					
R Disposable income, net	29.80	48.55	2,546.79	2,587.60	
Adjustment for change in net equity households in pension funds			82.01	82.01	
U Final consumption expenditure		32.18	2,244.14	2,276.32	
Adjustment for change in net equity households in pension funds			82.01	82.01	
Saving, net/current external balance	29.80	16.37	302.65	311.28	327.85

Table A7.1
Institutional sector account for inbound tourism, 1999

		Inbound tourism	General Govern-ment related to tou-rism	Rest of the eco-nomy	Total economy	Rest of the World
		mln Afl				
	Capital Account					
R	Saving, net/current external balance	29.80	16.37	302.65	311.28	327.85
	Consumption of fixed capital	72.51	0.11	240.46	313.08	
	Capital transfers, receivable			42.32	42.32	12.19
U	Gross fixed capital formation	227.31	0.06	671.75	899.12	
	Changes in inventories			53.09	53.09	
	Acquisitions less disposals of non-produced non-financial assets				0.00	
	Capital transfers, payable			45.32	45.32	9.19
	Net lending (+) / net borrowing (-)	−125.00	16.42	−184.73	−330.85	330.85

Source: Van de Steeg, 2005c.

8. Tourism modelling

8.1 Introduction

In the previous chapters, the TSA methodology and a set of related statistics based on this methodology have been presented for two very different countries, a Western European industrial nation, the Netherlands, and a small Caribbean island-state, Aruba. For Aruba I have, additionally, presented an extension into institutional sector accounts (chapter 7). The main purpose in developing these additional accounts was to enhance the economic and political relevance of tourism data and methodology.

Clearly, tourism has a different meaning for both countries. One reason is, evidently, the different size of the tourist sector in terms of measures, such as national income or national product. Having an idea of how developments within this activity will affect the country is of utmost importance, if tourism is one of the driving forces behind a country's growth and development. A high degree of interest in the future paths of the economy will be evident in many segments of society.

In the introduction to this study, I already pointed out the interest policy makers have in studying possible scenarios and projections. Scenarios can give insight into the effects and results that selected policy decisions can have on the economy. This is extremely valuable information as in many cases it is difficult, or even impossible, "to turn back the clock" and undo certain decisions. In terms of tourism economics, for example, an extra hotel could be constructed, infrastructure improved, or an additional tourist attraction built, such as a theme park or a golf course [1]. In such cases, economic modelling is one way to gain insight in the size and the type of effects of such investments on an economy. Results from the modelling exercise can be used to improve policy making and can lead to better decision taking processes. For Aruba I can refer here to the examples set by the studies of the Stichting ABC Advies and the dissertation of Croes (2000) [2].

Input-output modelling is an excellent vehicle for addressing issues like the above. It gives insight into the behaviour and reactions of the dominant players in a country such as industries, households, various types of labour, import and export organizations, and governmental agencies under different sets of circumstances. We can be interested, e.g., in conditions underlying continuing growth over the next decade, in particular, say, changes in demand following the entry of new competitors at the scene such as, in the case of Aruba, a further opening of Cuba. Shifts in international tourist movements can also be inspired by more thematically oriented changes, such as a shift to ecologically motivated tourism, or a reaction to perceived shifts in the hurricane season.

IO *models* have their own specific characteristics, which I shall discuss in the next sections. In one sense, opting for an IO type of modelling is just one choice among several other ones. There are other types of inter-industry based models, such as computable general equilibrium (CGE) models, based on a different modelling philosophy. In this study, however, I want to focus on IO models, a class of models that a) is closely linked to the System of National Accounts, b) can accommodate a high level of detail, and c) offers the possibility of calculating the direct and indirect effects of specific decisions or developments.

Input-output, generally speaking, is a method for systematically quantifying the interrelationships between industries in a complex economic system. There are several variants and sub-variants, but all share the underlying concept of a circular flow. That is, the economy is viewed as a network of actions and interactions between players of the type mentioned above. These players demand goods and services in exchange for money or other goods and services, including labour. The production and consumption activities concerned can be classified according to criteria such as type of product, technology in use, and organizational form. Production activities generate income which accrues to the factors of production, essentially labour, capital, land, and governmental services, paid for in several ways. In figure 8.1 an example of such a circular flow is schematically represented for a three-industry economy.

Figure 8.1 Schematic representation of a simplified circular flow in real terms[1]
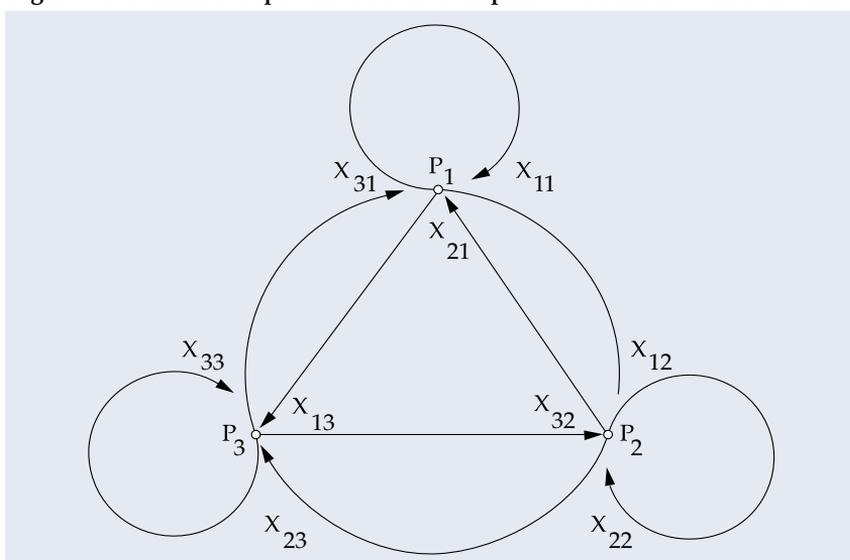
[1] See Gilibert et al., 1987.

The industries in figure 8.1 are indicated by the symbols P_1, P_2 and P_3. The symbols x_{11}, x_{12}, et cetera, stand for the inter-industry flows, the first suffix indicating the selling industry, the second one the buying industry. Each industry buys from and sells to any other industry, while selling and buying also takes place inside each industry, indicated by the small circles around the points P_1, P_2 and P_3. The IO model assumes a particular regularity in the inter-industry relations. For example, the industrial inputs (i.e. the products bought by each industry) are modelled as so-called Leontief or fixed coefficients production functions. Furthermore, the IO model also imposes 'equilibrium' in the sense that for each industry the total value of outlays equals the total value of receipts.

As I indicated already in chapter 2, a clear distinction should be made between IO models and IO tables. The tables reflect the economic situation for one particular time period, usually one year. As we have seen in sections 2.3, 2.4 and 2.5, these have a direct link with the national accounts system. Operationalization of the basic scheme usually takes place in terms of *transactions* between industries. These transactions, in aggregated form, are registered as the entries in a square or rectangular matrix, the input-output table[3]. We recall that the *rows* of the matrix register the sales of an industry to two kinds of customers, i.e. to the industries that are distinguished, and to the so-called final demand categories which normally include households, investments, government expenses and foreign countries. The first category is known as intermediate demand, the second as final demand, because the product undergoes no further industrial transformation, having reached its final destination.

The *columns* thus consist of the purchases of each industry from other industries, from abroad or from the providers of the so-called primary inputs, usually labour, capital (or depreciation), imports or governmental activities. This offers the possibility to interpret the columns as production functions. As we can see, the system is based on the concept of double bookkeeping; each element in a row is simultaneously an element in a column. The fact that in this way each registered output is also a registered input into some production process, gives additional structure to the entire system. We thus obtain a system that reveals the internal fabrics of an economy, connected by the flows of trade, from each industry in the economy to all the others.

An input-output table is constructed from the observed data for a particular time period (usually a year) and a particular area. The economic activity in this area consists of a number of production industries. These can be segmented by an internationally recognised classification scheme, such as the previously mentioned International Standard Industry Classification (ISIC). The level of aggregation can vary according to the opportunities that the data allow for, or the requirements of the goals set. Experience has shown that work on IO matrices construction involves continued discussions on the basic problems of classification, definition and treatment.

8.2 Some historical background of IO modelling

Before discussing the core elements of modern input-output modelling, it is useful to take a short look at its checkered past. Input-output analysis is based on a number of basic concepts that have their origin in the works of seventeenth and eighteenth century economists and philosophers. Among the fundamental concepts addressed, three notions are particularly relevant. That is, the notion of describing an economy in terms of a *circular process*, the notion of *productive interdependencies* among its constituent industries, and the concept of a *social surplus*. These are essential parts of the theory of production and distribution which IO offers, including the embedded theory of value. In the particular context that these notions offer, many scholars have struggled with definitions of what can be called the 'normal' or 'standard' cost of production. This is a recurrent theme, from the early beginnings all the way up to von Neumann and Leontief in the 20th Century. It is in this light that we can understand Leontief's preference for staying as close as possible to engineering data, i.e. data provided by engineers. As we shall see later, this preference is also reflected in the discussions around the later discovered "duality property" of Leontief-type models. The above preference, essentially, can be called a fourth fundamental concept in IO analysis, i.e. the wish to stay as close as possible to *observable values*.

Among the precursors William Petty (1623–1687) should certainly be mentioned. Petty had a adventurous career, being active in many positions of contemporaneous society. In his works he paid a great deal of attention to value theory: how does a product get its price, and how should we interpret the outcome normatively? Petty distinguished between what he called true or natural value on the one hand, and accidental value on the other. A product's natural value is what is 'permanent'. Petty views cost of production as the main determining cause of natural value. Accidental value is determined by 'contingent' causes such as speculation, weather conditions, or bad government. He also was one of the first to work with the notion of a surplus arising out of interactions between the proprietors of land, farmers, workers and their associates and assistants, entrepreneurs, and administrators.

Another precursor that should be mentioned is Richard Cantillon (1697–1734) in France. Cantillon was heavily influenced by Petty, basically accepting Petty's distinction between natural and accidental value. Cantillon employed the terms 'intrinsic value' and 'market price' where the latter is defined in terms of the quantity and quality of the lands and labour entering production. Cantillon also saw that differences in entrepreneurial rates of return are a consequence of differences in the fertility of land and the capabilities of labour. These will lead to a reallocation of investments over business opportunities. We can interpret these ideas as precursors of the views of later writers on the rate of profit.

However, the Frenchman François Quesnay (1694–1774) was the first to build a model of an entire economy. The model supported a particular political purpose. It contained the elements mentioned above (circularity, productive interdependencies, social value, and observable values). Also an, at the time, advanced notion of equilibrium-disequilibrium processes is present. Most importantly, Quesnay provided sets of empirical numbers to fit into his proposed model[4]. Unlike Petty or Cantillon, Quesnay distinguished a particular source of value, agriculture. The underlying phenomenon here was the so-called 'bounty of nature', i.e. nature's abundant fertility and productivity. Quesnay's predecessors attributed a significant role to land (or 'nature'), but this was always in combination with other factors. Quesnay, however, or rather, the philosophical school that he adhered to, physiocracy, was convinced of the unique role to be attributed to land in discussions on productivity. In fact, this unique source of value is the greatest resource that a country possesses and should be treated well (INED, 1958, 2005; Meek, 1962; Van den Berg, 1998)[5].

Quesnay's Tableau économique, developed in a number of stages around 1760, for the first time fully reflects the idea that social and economic systems can be described in terms of an uninterrupted and interconnected flow of goods and services from producer to consumer and back. Because of its fundamental role, and because modern IO analysis is often credited with being in this tradition, I shall devote a few words to the Tableau. First, however, a few words about its purpose.

The Tableau was developed to show scientifically that France was not doing well[6]. At the time, many felt that France was loosing power and influence to Britain. All over Britain new initiatives were developed, initiated by the new class of nationally and, especially, internationally oriented entrepreneurs and businessmen. At that time the foundation was laid for the British empire that one day would comprise a quarter of the world's land mass. It was also the time of Adam Smith who's "Wealth of Nations", which appeared in 1776, signaled the emergence of a new, market-based economy. In France, however, the situation was quite different. King Louis XV was continuing the policy of autocratic rule with emphasis on what many considered non-productive activities such as building castles or waging wars. That is, French resources were allocated in ways generally viewed as not producing any social value, basically constituting unproductive round-about consumption at a national scale. Many, also at the court in Versailles, realized this at the time. The attitude at the court is perhaps best summarized by Madame de Pompadour's famous "après nous le deluge" [in English: after us the flood][7].

A most interesting point in physiocratic thought is the insight it offers in the source of value. The core concept is productivity. Physiocracy defines productivity in terms of the product of agriculture. In fact, in line with Physiocratic basic doctrine,

all productivity is associated with the surplus of agriculture; agriculture thus is *productive*. That is, the total value of the goods and services produced by the farmers *systematically* exceed the total costs of production. All other classes such as the artisans, are, in this sense, not productive. Agricultural production (and, hence, the production of a surplus) is triggered by the demand for agricultural products. From this we have that a shift away towards increasing demand for other, non-productive goods, means a decline in the economy's surplus. Physiocratic based research produced several empirical rules to calculate the surplus in terms of the size of the agricultural activities involved.

Quesnay's analysis started with defining a natural situation, the "state of bliss". This is a situation in which the circular flow of production and income could reproduce itself indefinitely. Quesnay described this state (in its most well-known form), with three classes of society (see e.g. Quesnay, 1766)[8]. These classes consisted, respectively, of farmers, artisans (or manufacturers), and landlords. Much in line with the situation in France at the time, the surplus (produced by productive farmers) was appropriated in its entirety by the landlords in the form of rents. The landlords or proprietors spend these rents on products produced by farmers and artisans. The purchases of farmers' products thereby support productive efforts, those of artisans the production of unproductive luxuries. However, in 'equilibrium', i.e. in the state of bliss, the surplus is large enough to support both types of purchases. The Tableau can be considered as a political pamphlet, aiming to provide insight in the state of the French nation at the time using physiocratic doctrine.

Quesnay published his views in several versions, the first of which appeared in 1758 (INED, 1958, 2005). This was the so-called 'zig-zag'. Unfortunately, the zig-zag was little understood when it appeared. It was not until 1955 that Almarin Phillips published a transcription of the zig-zag into the by then familiar methodological framework developed by Wassily Leontief (Phillips, 1955). The resulting IO table, reproduced in table 8.1, is entirely in money terms, here thousands of *livres*. Money does not really play a role here as an autonomous factor to be discussed separately. This is usually interpreted in the sense that the entries in the Tableau reflect real value.

After having defined an initial situation which is "ideal", the state of bliss, the Tableau analyses, in the second stage, deviations from that situation. The full Tableau (not discussed here) offers an early type of dynamic analysis in the form of a set of consecutive comparative static Tableaux. The approach is integrated in the sense that changes in the relations of one class have their repercussions in the entire system. Another important characteristic is that the relations between the determining classes of society (i.e. farmers, artisans, and landlords) are described in terms of, in principle, directly observable relations.

Table 8.1
The Tableau économique

	Farmers	Artisans	Proprietors	Total Production
Farmers	**2,000**	2,000	1,000	5,000
Artisans	1,000	0	1,000	2,000
Rents	2,000	0	0	2,000
Total Purchases	5,000	2,000	2,000	9,000

The entries in the Tableau (in livres) directly reflect the physiocratic view that agriculture is the source of all prosperity. Only farmers produce a surplus which is (here) proportional to their so-called annual *avances* (here 2000, in bold)[9]. This surplus is appropriated by landlords in the form of "rents" (which thus amount to 2000 livres). It should be noted that the numbers reflect averages over time. In this way, the effects of good and bad harvests are neutralized. Artisans do not produce a surplus. The Tableau concentrates only on actions and reactions having to do with the production and distribution of the surplus. For example, there is an absence of foreign relations.

Given that only agriculture is productive, the core problem faced by the country then is how to maintain this productive core (or even to expand it). Quesnay starts the discussion with landlords changing their preferences, starting to consume less agricultural goods and buying more luxury goods than before. In his view this means that farmers' production now is less than before and that society's surplus diminishes. In a number of consecutive stages, society's surplus may decline substantially[10].

Many scholars have worked on the basis of the ideas underlying the Tableau, sometimes extending them, sometimes criticizing. An interesting example is Achille-Nicolas Isnard (1749–1803). Isnard criticized the physiocratic view that only agriculture is productive, and presented models that can be considered as in-between the Tableau and the later, essentially 20th Century IO models (Van den Berg, 2005; Steenge and Van den Berg, 2007).

Karl Marx (1818–1883) is possibly the best-known economist of the 19th Century. He was strongly influenced by Quesnay's Tableau, borrowing and/or adapting several concepts for his theory of reproduction, distribution and value. He distinguished two classes or departments, one of which produces the means of subsistence, while the other one produces the means of production. Labour is the single source of value. Marx describes a system in which one part of the same product (such as corn) is used as a means of subsistence while the other part is used as an input in its reproduction. We may see here a precursor of Leontief's distinction between intermediate inputs and final deliveries (see below).

His treatment of surplus value differs from that of Quesnay. Marx proposes an *inverse* relation between wages and profits. This is quite unlike Leontief's later treatment of social issues, but precedes writers like, e.g., Piero Sraffa (1898–1983). His insight in the way the *level* of the rate of profit is determined is also new. This way of being able to actually calculate this, precedes later work by Leontief (on the role of the dominant eigenvalue), Von Neumann (1903–1957), (on the uniform rate of growth) or Sraffa (on the maximum rate of profit and the inverse wage-profit relation); see further Kurz and Salvadori (2000) for a recent contribution on the history of economic thought in an IO context.

8.3   Modern Input-Output Analysis

Despite the many predecessors, modern IO analysis is, undoubtedly, to a large extent the creation of Wassily Leontief (1905–1999). Leontief explicitly traced the origins of his line of thinking back to Quesnay, such as the notion of a circular flow, the productive interdependencies and social surplus. In addition, there is the role of equilibrium concepts, and the somewhat less dominant role of prices and price formation. Leontief built IO tables for the United States for two years, 1919 and 1929 (Leontief, 1936, 1937 and 1941). He saw these as offering a Tableau Economique for the US. It is worthwhile to quote Leontief on this:

"The statistical study presented … may be best defined as an attempt to construct, on the basis of available statistical materials, a *Tableau Économique* of the United States for 1919 and 1929" (Leontief, 1936, p. 105).

Like in Quesnay's Tableau, Leontief IO analysis contains the notion of a surplus, but it has rather supplied a technological interpretation in terms of value added, several subcategories being distinguished. In this technological context, wages and salaries are given exogenously [11]. A strong emphasis on observables is shared with Quesnay, often in the form of technological data obtained in discussions with engineers. This gives a central role to the description of technologically determined production processes, which are accounted for in the form of technologically determined input or production coefficients, standing for "averages" of the methods of production in use. This reminds us of the entries in Quesnay's Tableau, also representing 'averages' especially designed to balance good and bad crops. This also reminds us of the much earlier efforts to distinguish natural and accidental value. In Leontief analysis prices definitely are present (because entries are in value terms) but do not play an independent role [12]. There also is a striking difference, however, with, especially, the physiocratic point of view. Unlike Quesnay, Leontief does not attribute a role to an explicit source of wealth. In fact, the typically Quesnaysian normative elements are lacking in his approach. Consequently, there also is no state of bliss.

During the 1960s, IO methodology moved to the core of modern national accounting, due to the work of scholars as Stone (1962). Simultaneously, authors like Chenery and Clark (1959), Brody (1970), Carter (1970), Evans and Hoffenberg (1971), and many others investigated the macroeconomic sphere. Extensions in regional analysis were initiated and presented by Isard (1951) and Polenske (1980). New developments into environmental and sustainability issues were initiated by many authors. In the context of my study I would like to mention Duchin and Lange (1994) and Lange et al. (2003). Duchin (1998) presented a methodological framework employing so-called structural economics. The founding of the International Input-Output Association (IIOA) in 1989 was a cornerstone in terms of international recognition; input-output analysis had found its way.

Leontief's approach reflects a disaggregate view of economic processes. At the time this meant a difference with especially Keynes and Tinbergen, who worked with highly aggregated models. Leontief defined a set of structural relationships, and started projects to empirically measure the coefficients in his model. In this process he adopted certain *simplifications* to enable him to deal with the gigantic task of structuring and accommodating the available material. One such simplification was to give a central role to production functions.

Each product is produced by only one technology, and each technology produces only one product. So there is a one on one relationship between product and technology. In addition, Leontief imposed an essential condition; the production functions were characterized by so-called fixed coefficients. That is, the necessary inputs per unit do not change when the scale of production changes.

The basic part of the input-output table is the transaction between its constituent parties, such as enterprises, consumers and governmental agencies. The set of transactions consists of two parts, intermediate and final deliveries in value terms (money). A delivery for intermediate use is an input in some (other) production process and therefore processed further. A final delivery is purchased without any intention of further processing.

A column vector is used to represent the intermediate purchases of a industry j, i.e. the sales of all industries to this industry j. The elements of this vector then register both the origin and the magnitudes of industry j's inputs. I shall give a small example, also from Leontief (Leontief, 1987). There is a two-industry economy, and one category of final demand, households. All entries represent the sizes of real or physical flows of goods or services.

Production or direct input coefficients are obtained by dividing each industries purchases, its "inputs", by its total production. IO analysis starts when we ask which consequences changes in certain entries in the IO table will have for the size

Table 8.2
Example of a Leontief input-output table

	Agriculture	Manufacturing	Households	Total
Agriculture (bushels)	25	20	55	100
Manufacturing (yards of cloth)	14	6	30	50
Households (man-years)	80	180	–	260

Table 8.3
Matrix of the accompanying input coefficients

	Agriculture	Manufacturing
Agriculture	0.25	0.40
Manufacturing	0.14	0.12
Households	0.80	3.60

of other entries. Let us consider the consequences of a shift in households demand. Writing x_1 and x_2 for the total production of industries 1 and 2, and with f_1 and f_2 standing for exogenous final demand for the first and the second good, respectively, we obtain:

$$x_1 = 0.25x_1 + 0.40x_2 + f_1$$

$$x_2 = 0.14x_1 + 0.12x_2 + f_2$$

Solving these two equations for x_1 and x_2 gives:

$$x_1 = 1.457f_1 + 0.662f_2$$

$$x_2 = 0.232f_1 + 1.242f_2$$

The above equations express total outputs x_1 and x_2 in terms of exogenous final demand f_1 and f_2. We observe that the values of f_1 and f_2 are multiplied by specific numbers to obtain total output. (To obtain x_1, f_1 and f_2 must be multiplied by, respectively, 1.457 and 0.662). These numbers are the economy's multipliers. As can be seen from this small example, they play a major role in any empirical work of an IO nature, and we shall encounter them again later in this chapter.

The above is also relevant for projections into the future; if the numbers just calculated do not change (or change according to known or expected rules), we gained an expression for both total outputs in terms of final demand. Clearly, the set of linear equations expressing the balances for each product being produced, or used in the course of one period of time, fully describes the interdependence among the industries of the given economy. Accordingly, industry j's demand for inputs

from the other industries is straightforwardly related to the amount of goods produced by the same industry j over the same period.

Assembling the input coefficients for the intermediate deliveries in a matrix A, we obtain:

$$A = \begin{bmatrix} 0.25 & 0.40 \\ 0.14 & 0.12 \end{bmatrix}$$

With x and f standing for the vectors of total outputs and final demand, respectively, and with I the identity matrix, this results in

$$(I - A)x = f \tag{8.1}$$

or,

$$x = (I - A)^{-1}f \tag{8.2}$$

where we already, just above, encountered the elements of the Leontief inverse or multiplier matrix $(I - A)^{-1}$ [13]

$$(I - A)^{-1} = \begin{bmatrix} 1.457 & 0.662 \\ 0.232 & 1.242 \end{bmatrix}$$

If A is "productive", the economy is able to produce a surplus. Mathematically, productivity is expressed in terms of the Perron-Frobenius or dominant eigenvalue of matrix A. In fact, the economy is productive if $0 < \lambda(A) < 1$, where $\lambda(A)$ is the Perron-Frobenius eigenvalue of matrix A. In that case, the multiplier matrix $(I - A)^{-1}$ is positive, that is, each element of that matrix is positive [14]. Well-known is the so-called power series approximation of the Leontief inverse which enables analysis of multiplier effects in terms of successive production rounds:

$$(I - A)^{-1} = I + A + A^2 + A^3 + A^4 + \dots \tag{8.3}$$

There is an accompanying price system. Supporting prices (often identified as market clearing prices) p are given by:

$$p(I - A) = v \tag{8.4}$$

where v is the vector of value added coefficients. If only labour is distinguished, as

in tables (8.2) and (8.3), v reduces to the vector of direct labour input coefficients; we shall adopt the symbol "l" in that case. Given (8.4), we can calculate straightforwardly the amount of labour "embodied" in a unit of final demand for each product. We obtain the vector of these values, indicated by the symbol l*, by pre-multiplication of the Leontief inverse by l:

$$l^* = l(I - A)^{-1} \tag{8.5}$$

For total employment L we now have

$$L = lx = l^*f \tag{8.6}$$

We observe that if the coefficients of A, v or l change, also the supporting prices will change. The coefficients change if, e.g., fewer inputs are required as a result of technological change. This may be reflected in smaller elements of matrix A, which, in turn, is equivalent to $\lambda(A)$ becoming smaller (see Brody, 1970).

In this simple model, outlays on capacity expansion are part of final demand. That is, the capacity requirements associated with an increase in final demand become relevant for the analysis only in a subsequent exercise. In 1953, Leontief presented a dynamic version of the static model (Leontief, 1953). He accomplished this by modelling investments in production capacity in terms of a second matrix, the so-called capital matrix. The ith row of this new matrix represented the sales of industry i to the other industries for enlarging productive capacity. The ith column, just as in the input-output matrix, registered the purchases of industry i needed for its capacity enlargement. Leontief's approach led to a number of developments. First of all, it provided a basis for multi-sectoral work in growth and development economics. Furthermore, it was a significant stimulus for theoretical work on the mathematical properties of dynamic models.

I referred to the role of IO tables in the modern national accounting systems several times, see especially sections 2.3, 2.4 and 2.5. As we have seen, a chapter on IO tables was included in the SNA68 (drafted by Stone) and in the ESA70. This was actually the first time that international guidelines put forward recommendations regarding such tables. In the SNA68, two types of tables are distinguished, supply and use tables and symmetric input-output tables. Methods are discussed to derive symmetric input-output tables from the supply and use system, employing a system of rules based on various assumptions. The tables can be of the industry x industry and the product x product type. The ESA70, on the other hand, only discusses symmetric input-output tables, of the product by product type.

In the SNA68, a matrix representation was employed (again proposed by Stone) to present an overview of the whole accounting system. This matrix is now commonly referred to as a SAM (see section 2.5) or National Accounting Matrix (NAM). A

distinction also going back to Stone, is the one between input-output tables that contain observations (supply and use tables) and input-output tables meant for analysis (i.e. the symmetric input-output tables). Finally, we should observe in the later guidelines (SNA93 and ESA95) a continuing shift from more formal and mathematical ways of presentation towards a more operational and concrete presentation of the IO tables (see further Bos, 2003, p. 25).

8.4   The modern SNA

In chapter 2 I introduced the supply and use tables for the first time in detail. As discussed, these tables have been especially designed to facilitate proper registration of economic transactions. The supply table of dimension p x i gives the production of products by each industry [15]. Two properties stand out. Unlike in Leontief's system, the number of industries need not be equal to the number of products, and a particular industry can produce more than one product. The use table, of dimension p x i, gives the deliveries of each product to each industry and to the final demand categories; i.e. here the inputs are registered. We have a square Leontief system if there is a one on one identification between product and industry.

In chapter 2, section 2.4.2, I presented a schematic arrangement of input-output data derived from SNA68. That representation was without external trade. In this chapter I shall return to the supply and use framework, this time also accounting for foreign trade. I shall use this occasion to present the supply and use tables in a somewhat different, but also generally accepted representation. First they will be presented separately. We have:

Table 8.4
The use table

	Industries	Final demand	Total
Products	U	F	q
Primary inputs	Y		Yi
Total	g′	i′F	

Correspondingly, there are:

Table 8.5
The supply table

	Industries	Imports	Total
Products	V′	q_m	q
Total	g′	m	

The symbols in tables 8.4, 8.5 and 8.6 (see below) stand for:

U: the intermediate part of the use table;

V′: the production part of the supply table;

F: matrix of final demand for products;

Y: matrix of primary inputs used by industries;

q_m: vector of imported products;

q_d: domestic production of products;

q: vector of total supply of products;

g: vector of total domestic industrial outputs;

m: total imports (a scalar);

i: the addition vector;

′: a symbol, denoting the transposition operation.

So the first row of the use matrix shows the absorption of products as intermediate input by industries (the elements of U) and by final buyers (the elements of F). The primary inputs are given by the elements of Y, these entries represent the economy's value added. V stands for the domestic output by industries of the various products, q_m stands for the vector of imported products, and m for total imports. The symbols q and g stand for the domestic output of each product and the domestic output of the industries, respectively. The vector i, a vector with elements all equal to one, is used for addition.

The above also allows an alternative representation of the supply and use framework, in line with Stone's earlier arrangement (see chapter 2) for a closed economy:

Table 8.6
The supply and use framework

	Industries	Products	Final demand	Import	Total
Industries		V			g
Products	U		F	$-q_m$	q_d
Primary inputs	Y				Yi
Total	g′	$(q′)_d$	i′F	m	

From the above we thus have the following relationships:

$$q_d = Ui + Fi - q_m \tag{8.7}$$

and

$$g = Vi \tag{8.8}$$

Also we have simultaneously,

$$(q')_d = i'V \ \text{and} \ g' = i'U + i'Y \tag{8.9}$$

For additional exposition, I refer to Konijn (1994). In the next section, I shall discuss current methods to derive an IO table from the SUT.

8.5 Deriving symmetric IO tables

We have seen that the supply and use tables are data-oriented in nature. They are formulated in such a way that there is a direct connection with the characteristics of the basic data. In fact, the supply and use tables have been designed such that the involved concepts, definitions and accounting rules remain close to the observed data; the tables are therefore based on observable data and, in this sense, are compiled using a minimum of assumptions.

Compiling homogeneous IO tables on the basis of a supply and use framework is not a straightforward matter. We have seen that (the compilation of) symmetric IO tables can be seen as a supplementary module, since they are constructed using a number of specific assumptions and imputations, while their primary purpose is analytical (Konijn, 1994, p. 88) [16]. Here the supply and use tables serve as the source from which the analytical input-output tables are constructed (SNA93, par. 15.7).

Furthermore, the term "homogeneous" itself is not without debate. Thage (2002) points to the often extremely heterogeneous character of the products being interpreted as the output of industries. Therefore, a better procedure would be to adopt the term "product groups" rather than "products". Thage also points out that the term "homogeneous" is actually quite misleading. Therefore, he proposes to use the qualification "mutually exclusive", a term which indicates that the composition of the product groups is rather arbitrary, and that the only thing one can say is that the products belonging to one product group do not belong to another one.

Therefore, a number of basic decisions underlie any effort at compiling a homogeneous IO table. The first major decision concerns the type of table we wish to compile. The supply and use framework is of the product x industry type. That implies that to build a homogeneous IO table, there are two options. We may want to build 1) a product x product table, or 2) an industry x industry table. In the first type, we describe an economy in terms of products being produced by other products. Choosing the second type, we describe the economy in terms of industries interacting with each other.

We also have to address the other question, i.e. which principle should be employed to distinguish between the separate products and between the separate industries? The literature seems to have a preference for products being distinguished based on technology (see also appendix 8.1). That means that IO tables would be built based on a strong assumption. However, practical work strongly advocates working on the basis of the weak assumption of fixed sales structures, because these are really observed. (I will address this issue and the terminology used more extensively below).

The decision taken can make a substantial difference in terms of the resulting tables. The terminology probably already makes clear that the basic structure we are dealing with is either of a technological nature (such as in the form of underlying production functions), or of a sales nature, i.e. a relation rather in terms of business relations. Also, a number of mixed or hybrid forms have been presented.

Thage (2002) presents the two following tables regarding the choices to be faced. The first one presents the four different ways a symmetric table can be constructed following SNA68. There are two types of tables, either p x p or i x i. These can be derived employing either a product technology (meaning that a product is produced in the same way irrespective of the industry that produces it), or an industry technology (meaning that all products produced by an industry are produced in the same way). (The classification in terms of a, b, c, and d returns in table 8.8).

Table 8.7
The four alternative symmetric input-output tables in the 1968 SNA

	Product by product table	Industry by industry table
Product technology	(a) Negative elements	(b) Negative elements
Industry technology	(c) No negative elements	(d) No negative elements

These methods are discussed in SNA93 and ESA95, and, in further detail, the UN Handbook (1999). These manuals express a certain preference for the product by product table based on a product technology. Thage points out, however, that the argumentation leading to these preferences is of a purely theoretical basis and neglect the extensive experiences obtained in the compilation and use of IO tables since SNA68, see further Thage (2002, section 6) and appendix 8.1.

The so-called product technology assumption has received much attention in the literature. Models based on this assumption have a number of interesting properties, see Steenge (1989, 1990a; Kop Jansen and Ten Raa (1990). However, invariably negative elements turn up in the calculated homogeneous IO tables. Another problem is that, to keep any analysis relatively transparent, the number of products

distinguished should not exceed, say, several hundreds. Given that fact that there are millions of types of products being produced, this means that we always are dealing with aggregates, even at that level. As pointed out earlier, the "products" that we ultimately work with, in fact may be a quite heterogeneous set of objects. Thage also proposes the following schedule, reproduced as table 8.8. The four possibilities found in table 8.7 re-appear, but in a different setting. The table points towards the i x i table based on a fixed product sales structure (here: number d). For an extensive argumentation regarding the choices to be made, see appendix 8.1.

Table 8.8
An alternative terminology for symmetric input-output tables

	Product by product table	Industry by industry table
Technology		Empty
Product technology	(a) Negative elements	
Industry technology	(c) No negative elements	
Sales structures	Empty	
Fixed product sales structures		(d) No negative elements
Fixed industry sales structures		(b) Negative elements

The above implies that we should be very careful in adopting technology assumptions in the sense that specific (i.e. unique) technologies should be associated with the production of specific products or product groups. The same is true for the imposition of technology assumptions regarding industries. Thage proposes the term "*strong* assumption", indicating that this assumption (indeed) is strong in the sense that it is usually not backed by empirical support.

Another approach is based on sales structures. That is, one looks at products being bought by industries. This is, by definition, an empirically supported observation. On this basis I can introduce the assumption of fixed sales structures as a basis for construction an IO table. Our construction can then be based on what Thage calls a "*weak* assumption", because it has its basis in observable facts.

Therefore, in general, for constructing an IO table, additional assumptions and guidelines are imposed on the data such as the presence of fixed coefficients or fixed sales shares. The IO table contains, therefore, firstly the assumptions regarding observation. Secondly, the assumptions involved in the compilation of the supply and use tables, and thirdly, the assumptions imposed on the supply and use tables to transform them into an IO table.

One of the first steps involves the distinction between domestically and foreign produced products. As we have seen, in the supply and use tables (see chapters 2 and 4) domestic output and imports of products belonging to the same product group have been grouped together. Users of analytical IO tables are often interested

in a distinction between effects on the domestic economy and on imports. Thus, part of the process of constructing a symmetric IO table often is making a differentiation between local production and imports. This means that in the symmetric IO table the elements have to be broken down according to origin, i.e. domestic or imports. This means that an assumption has to be imposed to separate the goods according to origin. This split generally takes place by means of market shares on the most detailed product level available.

At Statistics Netherlands symmetric input-output tables are published on a regular basis. These tables are of the industry by industry type, describing product flows between industries. For the formation of such a table, information is needed (or assumptions have to be made) on the type of products an industry produces, and on the origin of the products used by an industry. Here the assumption of a fixed product sales structure is used in combination with additional exogenous information on sales structures (see Konijn, 1994, p.136). For each product category a small matrix of the industry by industry kind is compiled. The corresponding row totals of the balanced use and supply table form the row and column totals of that small matrix. Each of the small matrices gives a complete description of the flows of that product category from its origins to its destinations. All information on the product flows of that specific product is filled in. Expert opinion in the shape of plain common sense is used to fill in the matrix. What is not known is later filled in with the assumption of fixed product sales structures. All the small matrices together constitute a complete IO table. In a final round of automated adjustments (involving relatively small changes) the symmetric IO table is compiled. The Dutch symmetric input-output table has been compiled combining a set of basic data, assumptions and expert guesses. With this method the probability of unlikely outcomes is limited, compared to outcomes obtained by applying a set of strict mathematical rules.

The most ideal situation would be if complete knowledge about the origins of each input and destination of each output exists. Because in many cases not even the producer has this information, it is therefore unlikely this information is available for statistical purposes. The second best thing then is to start filling the input-output table with as much statistical information and complete the table using the assumption of fixed product sales structure. The assumption of a technology structure is not appropriate here, as the sales structure is already used for the extraction of the imports. However, in daily practice this approach is not always possible as it is very time and data intensive. Below, I shall discuss in some detail the main theoretical approaches.

Some formal methods to derive an IO table from the supply and use tables
There are a number of formal mathematical methods to derive IO tables from the supply and use framework. Below I shall briefly discuss some of the main ones. As we have seen, essentially there are two approaches, i.e. a product x product or an

industry x industry IO matrix. For both, a number of methods are available to derive them. Each type has its advantages and drawbacks, such as the presence of negative entries, as reflected in the literature. In appendix 8.1, I shall provide additional argumentation in favour of one of these methods. In the p x p case, each secondary product is transformed from the industry actually producing it to the industry producing it as a primary product. In the i x i case, each secondary product is transformed from the product actually produced to the product produced as a primary product.

Konijn (1994, chapter 5) interprets the methods employed as transformation methods. That is, the supply matrix is transformed into a diagonal matrix with corresponding transformation for the use matrix. Below I shall, following Konijn, denote the intermediate part of the transformed use matrix by the symbol Z (furthermore, the symbols used are as defined earlier in section 8.4).

Let us first consider the case of deriving a p x p IO matrix. Possibly the most well-known method to derive the IO table is based on the so-called product technology assumption (PTA), i.e. the assumption that each product is produced in its own specific way, irrespective of the industry where it is produced. Thus, it is assumed that there exists only one technique for producing a specific product. With U and V as before, and with A the input coefficients matrix to be obtained, we have $A = Z(\hat{q})^{-1} = U(V')^{-1}(\hat{q})(\hat{q})^{-1} = U(V')^{-1}$, where the derivation goes back to Van Rijckegem (1967). There is also an alternative way of looking at this procedure by defining matrices that capture the structure of the industries. With $B = U(\hat{g})^{-1}$ and $C = V'(\hat{g})^{-1}$, matrix B thus gives the *input* structure of the industries in terms of the products, while matrix C gives the *output* structures of the industries. The IO matrix A now can be written as $A = U(V')^{-1} = U(\hat{g})^{-1}\hat{g}(V')^{-1} = BC^{-1}$. For a complete derivation and further exposition and criticism, see Konijn (1994, pp. 97–103).

The industry technology assumption (ITA) provides another way to derive a p x p table. The ITA assumes that each industry has its own specific way of production, irrespective of its product mix. That is, each industry has its own input structure. Following Konijn, we have that this amounts to assuming that matrix B above is fixed. In this case, we have $Z = BV$, so $A = BV(\hat{q})^{-1} = BD$ where $D = V(\hat{q})^{-1}$ is the so-called market shares matrix.

Let us now turn to deriving an i x i matrix. Here the basic assumption concerns the sales structure, which can be either product or industry based. Let me first discuss the case of deriving an i x i IO table based on the assumption of fixed product sales structures. That is, each product is assumed to have its own specific sales structure, irrespective of the industry where it is produced. The term sales structure here is defined in terms of the proportions of the output of a product in which it is bought by the intermediate and final destinations. We have $A = Z(\hat{g})^{-1} = V(\hat{q})^{-1}U(\hat{g})^{-1} = DB$.

Finally, we have the case of the industry x industry IO table based on the assumption of fixed industry sales structures. That is, under this assumption each industry has its own specific sales structure, irrespective of its product mix. Here we have A = $Z(\hat{g})^{-1} = \hat{g}(V')^{-1}U(\hat{g})^{-1} = C^{-1}B$. Sometimes this variant is called the i x i variant of the CTA.

8.6   *Combining the TSA and the IO table*

Tourism is implicitly included in the supply and use tables as part of the production of various industries such as hotels, restaurants and retail. Again, demand aspects are decisive in determining whether a purchase should be classified as belonging to tourism-related activities or not. For example, retail services provided by the local supermarket to local residents of the area do not constitute tourism production, whereas retail services provided by the museum shop to non-resident visitors are part of the tourism production. The TSA has been developed to enable readily available access to these various categories and to make this 'explicit', i.e. to extract the tourism shares out of the presented information in the supply and use table. However, the TSA only rearranges data, without changing the overall totals of production and consumption. The production process is not changed. Therefore, intermediate consumption, which is part of the use table, is not altered.

The TSA presents a number of tourism-related economic indicators such as tourism share in GDP and tourism employment. The TSA also provides input or data to be used in a modelling exercise. A major contribution of the TSA framework for IO types of modelling exercises is the construction of a *final expenditure vector specific for tourism*. This tourism final expenditure vector denotes the consumption of 'visitors' in the economy of all kinds of goods and services from the industries being distinguished. The purchase of meals in restaurants and groceries in a local supermarket by visitors, should all be included in this vector (Van de Steeg and Steenge, 2008). Lists of types and categories are available. In the TSA: RMF set of recommended tables, tourism consumption expenditure can be found for inbound tourism in TSA: RMF table 1, for domestic tourism in TSA: RMF table 2, for internal tourism (which is inbound and domestic tourism combined) in TSA: RMF table 4 and TSA: RMF table 6. These tables contain a column with tourism consumption by product.

A great many choices are involved in compiling the tourism final consumption vector. Clearly, this vector should comprise various kinds of consumption of visitors, such as domestic visitors, business tourism and inbound tourism. Also, the purchase of durable consumer goods for a trip, such as camping equipment, cameras and luggage, should be included in tourism final consumption expenditure (see also chapter 3 on this).

Table 8.9
Tourism exports vector for Aruba by product, 1999

	Tourism exports/total inbound tourism demand
	mln Afl
Hotel and other lodging services	343.89
Food serving services; beverage serving services for consumption on the premises	247.38
Land transport services	30.55
Air transport services	70.01
Supporting and auxiliary transport services	25.58
Real estate services for timeshare sales	
Leasing or rental services without operator	42.10
Support services	2.47
Gambling and betting services	157.97
Other recreational, cultural and sporting services	51.16
Retail trade services	81.97
Telecommunications services; information retrieval and supply	10.07
Other professional, scientific and technical services	2.36
Non specific goods and services	226.88
Total output	1,292.39

Source: Van de Steeg, 2005a.

In table 8.9 the consumption of inbound visitors in Aruba for 1999 is presented [17]. The tourism expenditure vector presented here is expressed *by product*. However, the IO table for Aruba, which will be discussed in the next paragraph, is of the industry by industry kind. Therefore, I have transformed the expenditure vector from a product to an industry dimension. For instance, 'food serving services; beverage serving services for consumption on the premises' are mainly produced by two industries, namely hotels and restaurants. For the IO table this amount is distributed among others, to the industries hotels and restaurants (see table 8.10). In this way the vector can be incorporated in the input-output table. To do this, I have matched the different goods and services purchased by visitors with the supplying industry. This process of matching is the same one as has taken place for the other final consumption categories such as household and government consumption. Household consumption, government final consumption and gross capital formation have also been adjusted from the expenditure expressed by products to industries to make it fit in the IO table. The basic information, such as surveys and census information and the supply and use tables of Aruba, have been used for this transformation.

In table 8.10 [18] the vector of the consumption of inbound visitors is shown *by industry* [19]. This vector is the transformed vector originating from the Aruba TSA (see tables 8.9 and A4.2). The expenditures on different products mentioned in table 8.9 are gross (the term gross here refers to the fact that the expenditures consists of various items such as value added of local producers, imports and taxes on production and imports minus subsidies). For the tourism expenditure vector (table 8.9) to fit in the IO table, I had to extract the imports and taxes less subsidies from the expenditures (the imports and taxes less subsidies are presented separately in table 8.10 in the bottom of the table).

Accounting for Tourism

Table 8.10
Tourism exports vector in IO by industry, 1999

	Tourism exports/total inbound tourism demand
	mln Afl
Agriculture, hunting, forestry; fishing	0.48
Mining and quarrying	
Manufacturing	24.30
Electricity, gas and water supply; manufacture of refined petroleum products	6.12
Construction	
Wholesale and retail trade; repair of motor vehicles and household goods	133.63
Hotels	476.27
Restaurants	162.56
Transport, storage and communications	130.22
Financial intermediation	0.00
Other business activities	43.81
Public administration; compulsory social security	
Education	
Health and social work	
Other community, social and personal service activities	151.58
Total	1128.97
Imports	125.90
Taxes on production and imports less subsidies	37.52
Total	1,292.39

Source: Van de Steeg, 2005a.

Comparing the two tables, it can be concluded that hotels do not only provide 'hotel and other lodging services' but also other services such as food and beverage serving services. The amount of imports seems to come to a relatively low amount but the almost 126 million Aruba florin only include visitors purchasing imported goods in stores in Aruba. Imported goods and services used as intermediate consumption, such as fruits and vegetables by restaurants, are part of the column of each industry.

Later in this chapter the effect of changes in tourism expenditure, such as an increase or decrease of tourism expenditure, will be estimated using this vector. The contribution of the TSA is a detailed tourism final consumption vector. However, it should be pointed out that it is not true that such a vector cannot be constructed with other means. There are cases where a rough estimation of tourism expenditure suffices, and for these cases a general share of each product category, such as meals and overnight stays, can be attributed to tourism. This, however, is a very rough method and can result in a substantial over- or underestimation of tourism expenditure, and therefore tourism.

8.7   Deriving the Aruba IO table

To derive the Aruba IO table for the year 1999, I used the Aruba supply and use tables and basic data, such as surveys and census results. I produced the table

presented in this study "from scratch" as no such table was available from the Central Bureau of Statistics of Aruba[20]. During the study, this Bureau did provide me with data that were more detailed than those available in its publications. The row and column totals of the published supply and use tables are found again in the IO table (CBS of Aruba, 2003b). The basic information is applied in the calculation of the lining of the IO table. The result of this exercise is table A8.1 (Van de Steeg and Steenge, 2006; Van de Steeg and Steenge, 2008).

The way the Aruba IO table has been compiled is therefore different from the way the Statistics Netherlands' IO table is regularly compiled. Nonetheless, the basic underlying philosophy is much the same. In principle, the resulting i x i table is obtained, using the sales proportions method, as discussed in section 8.5. In this, the practical and theoretical objections against methods based on technology assumptions have been decisive. Regarding the selection of industries in the table, I refer to the discussion of the classification in terms of primary, secondary and tertiary activities in chapter 4. Below in a number of steps the compilation processes are described in detail.

The actual construction of the Aruba IO table can be divided into a number of steps. The first two steps are highly labour intensive and require a substantial amount of detailed information. In compiling the table, special attention has been paid to imports. Aruba has a relatively small agricultural and manufacturing base, which is reflected in a high level of imports of agricultural and manufactured goods. This basically determined the first step. To be precise, *firstly*, imports and 'taxes on production and imports less subsidies' are removed from intermediate consumption, final consumption expenditure, gross capital formation and exports. I have done this by calculating for each product category the share of imports, and taxes on production and imports less subsidies. These shares are used to estimate the amount of imports and taxes less subsidies, which is included in the various industries and final expenditure categories. It is assumed that all use categories (i.e. intermediate consumption, final consumption, gross capital formation and exports) have an equal share in local production, imports and taxes less subsidies, except for the export from the free zone. (This is because free zone exports are not subject to 'taxes on production and imports less subsidies' and consist completely of imports).

Secondly, for all product categories I determined from where the products originate, i.e. which industry produced them and/or if they are imported. This, together with the information on the type of consumption, determines the allocation of the amount in the IO table. Imported products are allocated at the bottom of the table. The locally produced products, which are found in intermediate consumption and final expenditure categories, are assigned to the producing industry. The different final expenditure categories distinguished are household and government consumption, investment, export and tourism consumption.

The above two steps result in a table where neither imports nor 'taxes on production and imports less subsidies' are included in intermediate consumption and the final expenditure categories. Also, the various products are allocated to the producing industry or to imports. The resulting table is a first, rough version of the IO table. After this, several statistical adjustments have to be made to obtain the final table.

In the Aruba supply and use tables the financial intermediation services indirectly measured (FISIM)[21] have been allocated to a notional unit as intermediate consumption. For the construction of the IO table the FISIM is distributed over the different industries as intermediate consumption. The notional unit is excluded from the IO table. The individual industry totals of intermediate consumption and value added are therefore no longer equal to the published figures in the supply and use tables. However, total intermediate consumption and total value added of the economy have not been altered.

Trade and transport margins are primarily produced by the wholesale and retail industry, and the transportation industry, but other industries can also generate some minor sales and transportation services. In the supply table basic prices of goods, i.e. producer prices, are transformed into purchaser price by adding the trade and transport margins to these goods in a separate extra column. The purchase of a good is linked to the purchase of a trade and/or transportation service. Because trade and transport margins are included in the prices of goods at the time of purchase, it is difficult to estimate which part of the value constitutes the good and which part involves the margin. Trade and transport margins in IO tables are in certain instances taken outside the intermediate consumption part of the table (in a separate row and column). In this case assumptions have to be made to estimate the margins. However, these margins are payment for a sale and/or transport service. It seems justifiable to include these expenditures as intermediate consumption of the different industries and final expenditure categories. Excluding the margins from the part of intermediate consumption in the IO table will, when calculating the Leontief inverse, generate smaller multipliers.

In case of Aruba, trade and transport margins are already part of intermediate consumption in the supply and use tables. The wholesale and retail industry in Aruba is the primary producer of trade and transport margins. In Aruba, transportation, and therefore transportation services, takes place on a limited scale[22]. The trade and transport are relatively easy to incorporate in intermediate consumption in the IO table. Besides increasing the multipliers this has had also consequences for the final expenditure vector of tourism export. The purchase of a retail and trade service is now included in the final expenditure of tourism.

This study is about the role tourism plays, whereby I focus specifically on inbound tourism. Therefore, I have included the final expenditures of inbound tourism in

the Aruba IO table[23]. Looking at the expenditure of inbound tourism in the IO table of Aruba, the share of imports is relatively small. Most of the food items, souvenirs and non-food items such as textiles and jewellery are imported. However, these imports refer only to goods directly bought by non-resident visitors. The imports included in the services bought by non-resident visitors, can be found in the column of the respective producing industry, such as hotels and restaurants. Taking into account these imports, it becomes clear that the share of imports in inbound tourism expenditure is significant.

I should stress that IO modelling with tourism statistics does not have to be limited to the consumption of inbound tourism. In chapter 4 of this study the TSA of the Netherlands has been discussed. The Dutch TSA makes a distinction between several kinds of visitors and, therefore, visitor consumption. The results for the Netherlands refer to consumption of domestic tourism, inbound tourism and internal tourism, and are presented in table 4.1[24]. All these different expenditure categories consist of vectors which can be introduced in IO tables (and therefore can be used in IO modelling). The effect of changes in any part of the tourism expenditure vector can be calculated and a specific kind of tourism targeted for policy purposes.

In the next paragraphs, I will use the tourism expenditure column to model the effects on the Aruba economy of changes in inbound tourism. Also, the indirect effect of inbound tourism is calculated with the aid of input-output modelling.

8.8   IO modelling and the TSA

The essence of the questions posed in IO analysis often is about the influence of exogenous changes on the economy's basic variables. IO models, as we have seen, are traditionally used to estimate the impact of a change in final expenditure (of which various sub-categories may be distinguished) in an economy. In our case, these final expenditures are associated with tourist arrivals from abroad. The meaning of the term "impact" is relevant here. To quote Miller and Blair on this (1985, p. 100): "When the exogenous changes occur because of the actions of only one "impacting agent" (or a small number of such agents) and when the changes are expected to occur in the short run (e.g., next year), the term *impact analysis* is usually employed". Given the focus in this study on one specific industry, the term impact is definitely warranted.

Quite a few decisions are involved in applying input-output analysis in this area. To see which decisions are involved, let us return for a moment to section 8.3, and let us start from the initial situation described, in model form, by the equations:

$$x \; = \; (I - A)^{-1} f \tag{8.2}$$

and

$$L = lx = l*f \tag{8.6}$$

where the symbols are as before. (So only one value added category, labour, is distinguished). Suppose we want to study the impact of a change in final demand from f to f'. We then are interested in the consequences for total output, and in the breakdown in changes in the industrial outputs. But we are also interested in the consequences for employment, again in industrial breakdown, and for other crucial variables, such as imports. In addition, we may be interested in other aspects, such as the time required before any changes can be observed on the labour market, or the geographical extent of the effects[25].

In this section I shall discuss a number of indicators that are based on the model of section 8.3. Most important in terms of modelling is insight in what should be viewed as exogenously determined, or "independent" and what should be viewed as endogenous or "dependent". If the model of section 8.3 is interpreted as being closed in the sense of an absence of foreign relations, and if f is a single column vector standing for all types of final demand taken together, the model immediately gives the required total output and total employment, including the industry breakdowns of a change in f. If only one primary factor, labour, is distinguished, the wage sum is such that final demand can be paid for exactly. Or, in terms of changes, any additional consumption can be paid for out of the increase in wages.

Matters become more complicated if several final demand categories are distinguished, such as in the Aruba IO table (i.e. table A8.1). An increase in arrivals (the third column in the final demand quarter) can be expected to have direct and indirect consequences for the wages that will have to be paid. But these wages, in turn, may have a built-in effect of their own, in that they can also lead to an increase in final demand for specific goods. Therefore, in this sense, "normal" Aruba final demand may become an endogenous variable, being reactive to changes in one of the other final demand categories. Capturing these types of effects will require variants of the IO model of section 8.3 that I shall discuss further below.

A number of terms are used to describe the various effects that I am interested in. In this, I shall essentially follow international usage. Basically, the effects to be expected can be divided into initial, direct, indirect, and induced effects, see below. The notions of direct and indirect effects have already been encountered several times. The notion of an induced impact is relatively new, and originates from wishing to find some kind of measure for the way incomes generated by tourism are spent (Martin, 2004).

In an economy, the demand for products thus has a 'trickle down' effect on other production. However, there also is another effect because part of the effects "stop

going around", and leak out of the economy. Various leakages can be identified, such as imports, savings and labour and capital transfers going abroad (Martin, 2004). The connection between tourism statistics and the institutional sector accounts, which has been explained in chapter 7 of this study, shows the relationship that tourism has with the rest of the world[26].

There are other issues, naturally. A major one concerns the question what a holiday destination such as Aruba can do to attract new arrivals. We can think of enlarging the airport, constructing new hotels or building another golf course. Also, in addressing such questions, special variants of the basic model will have to be employed. This raises the same question as before. That is, we have to ask which regularities we wish to account for, and how we should model these. These regularities may be based on observed and stable patterns, such as in production or sales relations. However, in many cases they also may involve hoped for or untested regularities, such as the persistence of customer relations once, say, capacities have been enlarged.

Some special indicators

Let us first consider a number of indicators that are regularly being used in modern analysis. A central idea is to make a distinction between the *initial* and *direct effect* of an exogenous change in final demand, and the *indirect* and *total effect* of that change. We shall focus first on the concept of a total effect. This can first be defined as the sum of initial, direct and indirect effects, thereby using the Leontief inverse of a model that is *open* with respect to households. Here the concept of so-called simple multipliers is used. However, there is a second definition. This second definition makes a distinction between *initial*, *direct*, *indirect*, and *induced* effects and the corresponding multipliers. The interpretation here is in terms of a model that is *closed* with respect to households. Note, however, that the nomenclature is sometimes confusing. Below we shall basically follow Miller and Blair (1985, footnote 1 in chapter 4) who propose, in terms of the power series approximation to the Leontief inverse, to associate the term "initial" with the I term, the term "direct" with A, and finally the term "indirect" with the sum of the remaining terms, i.e. $A^2 + A^3 + A^4 + \ldots$. The term "total" then will be used to capture the effect of all terms together. We shall use a similar classification when "induced" effects arise, i.e. the total effect is the sum of the initial, direct, indirect and induced effect.

Before further discussing the available set of multipliers, another concept shall be addressed first, i.e. that of the strength of industrial linkages[27]. Clearly, insight in the strength of the relations between industries is essential in any type of impact studies along IO lines. Several indicators for numerically expressing the strength of linkages have been proposed over the years; see Miller and Blair (1985, chapter 9) for a discussion of the major ones. We shall in this section focus on linkages of the

backward type, leaving linkages of the so-called forward type as a point for future study [28]. Backward linkages measure the links between a particular industry j and the industries whose products are used as inputs in that industry's production process. The measure should express the fact that if industry j increases its production, also the production of those industries that are selling to this particular industry are faced with increasing demand for their products. The linkage also means that industry j, after having decided to increase its production, must be aware that the realization of that decision depends on the capacity of the delivering industries to increase their production.

Let, as before, matrix A denote the matrix of direct input coefficients (see section 8.3). Its jth column then represents the input column of industry j. Adding the elements of this column gives the direct backward linkage. Denoting this linkage by the symbol $B(d)_j$, we thus have [29]

$$B(d)_j = \sum_i a_{ij}, \qquad\qquad j = 1,\dots,n \qquad\qquad (8.10)$$

So, if production of industry j should increase by one unit, a direct consequence would be that inputs with a total value of $B(d)_j$ would be required. These would have to be available when needed, and would have to be paid for. We can repeat this exercise for each industry. So, more generally, with $B(d)$ the row vector of column sums and i again the unity row vector of dimension 1 x n, we have

$$B(d) = i'A \qquad\qquad\qquad\qquad (8.11)$$

Backward indicators already provide significant information. For example, one of the basic determinants of the importance of tourism is the amount of employment and imports associated with it. The column sums of the A matrix already give much insight into the relative magnitudes here. Furthermore, if there was a choice in selecting which industry's production to increase, we might want to select the industry with the highest element in $B(d)$. I have to point out that the above measures are expressions for existing linkages; they are not yet part of an IO model to be used to capture specific reactions, though they will return below as elements of multipliers.

Let us now turn to the indirect inputs. Here it is preferable to start with the notion of total required inputs. Recalling that total effects have been defined as the sum of the initial, direct and indirect inputs, and also recalling that the elements of the Leontief inverse $(I - A)^{-1}$ stand for the total required inputs, we have

$$B(i + d + ind)_j = \sum_i \alpha_{ij}, \qquad\qquad j = 1,\dots,n \qquad\qquad (8.12)$$

where i, d and ind stand, respectively, for the terms initial, direct and indirect; α_{ij}

stands for the (i,j)th element of the Leontief inverse. Repeating this for the entire multiplier matrix, we obtain

$$B(i + d + ind) \ = \ i'(I - A)^{-1} \tag{8.13}$$

where $B(i + d + ind)$ is the row vector of the total backward linkages. As in the case of the column sums of the A matrix, also here the column sums give much needed information on the sizes of the important interdependencies, now bringing together also the indirect effects.

Next to providing indicators of the strength of the linkage in question, both $B(d)$ and $B(i + d + ind)$ also are used to locate specific key industries, a concept that plays a significant role in policy studies [30][31]. Because this study is about accounting, I shall not go further in explaining this issue. Variants such as indicators for forward linkages will be part of a future study.

Imports

Invariably, tourism impact studies have to address questions concerning the 'net effect' of increases (or decreases) in national or international arrivals. A major issue in such questions concerns the role of import-export relations. In that light I shall in this subsection first briefly address some issues relating to imports. After that, I shall turn to various types of multipliers that have been proposed to measure the effects related to changes in final demand.

Obtaining 'net' figures often means that imports must be given special attention because they can "dilute" the impulses given by increases in final demand. So, a first point is that we would like to know if the money spent by tourists stays in the country, or must be spent immediately on imports. Suppose e.g. that the country of arrival cannot grow the food or produce the drinks to be associated with an increasing touristic flow. In such a case, a substantial part of the additional income may leak away to other countries. The same may be true if there are capacity constraints in the labour market. If this means that the needed labour force must be hired from other countries, it also will mean that the money earned by the newly hired persons probably also will leak away to a large extent. Another question to be addressed, is whether imports are competing with domestic products, or are non-competitive in this sense. Issues like the above clearly have implications for the type of model to be adopted.

There are several ways to proceed. All of these depend on the problem at hand and on the availability and the quality of the data. In this paragraph I shall briefly present two methods that are regularly encountered. However, several others can be found in the literature, highlighting specific situations that the researcher may be confronted with. In the model of section 8.3 I did not discuss relations with

foreign countries. That is, it was tacitly assumed that the country was closed for foreign economic relations. However, if imports become an issue, we must reconsider our basic variables. If we want to interpret x in equation (8.2) in terms of domestic production, this equation possibly must be re-interpreted. For example, in introducing the above output equation, we must be sure about the interpretation of matrix A. If A is in terms of production functions that are identical at home and abroad, no problem will exist. If this is not the case, a further correction must be applied. One way of doing that is by correcting the coefficients of the A matrix for competitive imports. We then would work with matrices like:

$$A^* = K^*A \tag{8.14}$$

where K^* is a diagonal matrix where the diagonal elements reflect the presence of competitive imports. This reduces the components of the output vector accordingly [32]. However, quite different procedures may be used as well.

Multipliers

Several types of multipliers are distinguished in the literature. As pointed out in the beginning of this section, unfortunately, classification and nomenclature are not always uniform in using them. I shall basically stick to two kinds of distinctions, one in terms of initial, direct and indirect effects, and a second one in terms of simple and induced effects. The first distinction (based on 'simple' effects) was already briefly discussed above (see section 8.3). To sum up these effects I will use again the term "total" effect. The second distinction (based on 'induced' effects) will be reserved in this study for problems dealing with the role of households' consumption. If household consumption is exogenous, I will speak of simple multipliers. In the case this consumption is endogenous (i.e. reacts to other impulses), I will additionally use the concept of induced effects. The term "multiplier", indicating that some impulse is being multiplied or "blown up", implies that we need a starting point, i.e. some point of reference, in defining them. In our case, this means that in each case a denominator is needed for scaling the phenomenon in question, i.e. the nominator. Below we shall adopt the unit change in the relevant exogenous variable as the basic unit.

The induced multiplier has essentially been developed to catch the effect of the additional income that has been earned as a consequence of the increase in demand. This, in particular, is an area that is situated at the crossroads of standard IO theory, and IO variants that are based on marginalistic ideas. Looking at the numerical example of section (8.3), *without further modification*, an increasing final demand would imply that the additionally needed labour force will receive the same wage as before. Also, it would be assumed that the additionally employed labour force will exhibit the same consumption behaviour as before. And, employing standard IO theory, we would expect the system's production functions to remain the same.

That is, the input proportions remain the same, as does the relation between the entire set of inputs and the industry's output. Similarly, the same would be true for those relations that reflect consumption choices and behaviour. However, whether this really is the way the additional income will be spent in reality will require additional research and know-how, which is largely outside the present study.

Also here multiplier analysis plays a role as well. Clearly, if domestic employment and consumer behaviour are reacting to exogenous impulses (such as those arising from additional touristic arrivals) we will have to consider these as being endogenously determined rather than exogenously. In terms of the model, we will have to attribute to the existing consumption patterns a role similar to the normal, fixed coefficients industrial production functions. This means that we will have to restructure the previous consumption-employment relation into an additional production function. In terms of our model, this will mean that we will need an IO table of an enlarged type: if the original industry x industry matrix has dimension n x n, the associated coefficients matrix will have dimension (n+1) x (n+1). It then is a matter of further research if the coefficients of this somewhat peculiar production function really behave like the standard production functions. It is quite possible, e.g., that we should encounter a situation that would require the use of some form of Engel-curves. Further research should involve trying out several basic hypotheses regarding consumer reaction.

Thus, in exploring a new situation, it is by no means sure if the underlying assumptions of IO analysis are still satisfied in that situation. Also other issues may be at stake. For example, capacity problems of various kinds may be present. We can observe, e.g. that "reality" finds solutions in directions the description and interpretation of which requires adapted forms of IO analysis. One outcome may be that competitiveness motivations underlie decisions to resort to various types of informal or "black" markets. This might show up in an IO table as a wage row which is different from the expected ones. Also, the corresponding consumption pattern column may differ. One reason may be different consumption and saving behaviour for the additional types or classes within the labour force. Theoretically, a so-called Social Accounting Matrix (SAM) may be a good instrument in this case. For a case like Aruba, adding certain proportionality assumptions may be appropriate. For example, we may assume that the consumption bundle associated with the additional wage is βf, where β is a parameter between 0 and 1 (and where f stands for the traditional households' consumption bundle). We may, however, also assume that relative proportions within the households' consumption bundle itself will vary. For each case the IO model to be used then needs to be adapted correspondingly. Actually, in exploring these paths, we are gradually entering the area of marginal IO analysis. Because they essentially are outside the context of this study we shall only occasionally touch upon these matters below. (Regarding applications to Aruba, I refer to the next section).

A standard distinction is between:

1. *output multipliers*, which measure effects on outputs;
2. *income multipliers*, which measure the effects on incomes, and
3. *employment multipliers*, which measure the effects on employments and jobs.

The output multiplier has been discussed earlier. It is the 'standard' multiplier defined via the Leontief inverse. Following Miller and Blair (1985, p. 102) we have: "an output multiplier for sector j is defined as the total value of production in all sectors of the economy that is necessary in order to satisfy a dollar's worth of final demand for sector j's output". In formula form we meet here again equation (8.2), the jth column of matrix $(I - A)^{-1}$ standing for the effect of an increase of one unit of exogenous final demand of product j[33].

To obtain household income multipliers for industry j (with households exogenous), we pre-multiply the jth column of the Leontief inverse with the labour input vector, i.e. the vector l above. Adopting the symbol H_j for the (simple) household income multiplier for industry j, we thus have[34]:

$$H_j = \sum_i l_i \alpha_{ij} \qquad\qquad j = 1,\ldots,n \qquad\qquad (8.15)$$

where l_i stand for the ith element of l and α_{ij} stands again for the (ij)th element of the Leontief inverse. A different type of multiplier is obtained when households' demand is endogenously determined. In that case, as pointed out above, households is treated as the (n+1)th industry. Correspondingly, the total household income multiplier for sector j, including the induced effects, denoted by the symbol $\underline{H}_j$, becomes:

$$\underline{H}_j = \sum_i l_i \alpha_{ij'} \qquad\qquad j = 1,\ldots,n+1 \qquad\qquad (8.16)$$

where the symbol l now stands for the corresponding labour input vector of dimension $1 \times (n + 1)$ and where the α_{ij} (i = 1,…,n + 1; j = 1,…,n + 1) are the elements of the expended $(n+1) \times (n+1)$ Leontief inverse[35]. Correspondingly, we can define two types of income multipliers, denoted as Type I and Type II. For Type I multipliers we have[36]:

$$T_j = H_j / l_j \qquad\qquad j = 1,\ldots,n \qquad\qquad (8.17)$$

and for Type II multipliers:

$$\underline{T}_j = \underline{H}_j / l_j \qquad\qquad j = 1,\ldots,n + 1 \qquad\qquad (8.18)$$

If we wish to distinguish additional types of income, we need a slight extension of the above. The relevant income multiplier is then obtained if all income (i.e. wages, profits and rents) earned is treated as one single (primary) input.

The so-called tourist income multiplier is the weighted average of the industry income multipliers, where the expenditure pattern of the tourists provides the weights. If the expenditures of all tourist categories together are considered, the so-called *average tourist income multiplier* (ATIM) is obtained.

The employment multipliers are not discussed in further detail at this point. These multipliers are used when income can be analysed in term of the number and types of jobs corresponding to a specific employment figure.

Baaijens et al. (1998) discuss the factors that influence the size of the income multiplier. They distinguish four groups of factors:
1. The economic model used. In my case this includes the link between model used and national accounts and TSA, the definitions of the central variables, whether simple or induced multipliers have been employed, et cetera.
2. The expenditure pattern of tourists. If tourists spend their money on buying products from industries with a high industry multiplier, the larger the tourist multiplier.
3. The characteristics of the firms in the region. An important factor here is the diversity of the region's activities. For example, if there is a large share of imports, indirect employment and income effects will be relatively small. Also, the expenditure patterns of the industries influence the multiplier. In general, firms owned by local people can be expected to create relatively more jobs and income, because the propensity to import can be lower. Other factors, such as the ways in which profit is distributed and labour intensity, also matter. If more labour is employed in proportion to capital, more direct employment and income is generated.
4. The behaviour and spending characteristics of the local/regional households. Here the induced effects are important. Furthermore, saving behaviour is relevant; if saving is viewed as leakage; the higher consumption is, the larger the induced effect will be.

8.9   *The size of the Aruba tourism activity*

In the previous section I presented a selection of indicators designed to capture specific economic effects. In this section the focus is again on Aruba. I shall, in two variants, address the question of how large the tourism activity is for this island state.

At first hand, this question may be somewhat surprising, because such an exercise may look straightforward. However, we have seen a) that the definition of tourism and tourism related activities is not without debate, and b) that there are quite a few indicators that can be used for the particular phenomenon we are studying, which means that choices have to be made. Regarding the employed definitions,

we will have to accept – at least in the context of this study- the choices made. I shall address two issues, the first dealing with the present importance of tourism in the Aruba economy, taking into account both direct and indirect effects. The second one will be to confront the standard multipliers and the ones to be used for calculating induced effects [37]. Also here, as we shall see, choices are involved.

First, let us consider the basic data. Table A8.1 we have already discussed. This is the IO table for Aruba for the year 1999. The corresponding 15 x 15 input coefficients matrix is given in table A8.2 (represented by the symbol A in the mathematical model). The associated multiplier matrix or Leontief inverse is given in table A8.3 (i.e. matrix $(I - A)^{-1}$ in the model).

In addressing the main question (i.e. "how important is tourism in 1999?"), a number of approaches are possible. Let us start by presenting some of the indicators we introduced in section 8.8. The column sums of A are the direct backward linkages for the respective industries, as given by equation (8.11). The values for Aruba are given in the final row (Direct backward linkages) of table A8.2. I have also calculated the 'simple' multipliers (i.e. households being exogenous). The results are given in table A8.3. The column sums of the multiplier matrix are the total backward linkages as given by equation (8.13), for each industry.

The size of the calculated linkages indicates that a substantial amount of (per industry) direct inputs is paid out to imports and primary factors. The industrial links do not seem especially large, neither are they especially low. A further analysis of the multipliers is beyond the scope of this study. However, below we shall discuss some additional aspects of this type of multiplier analysis.

Let us now focus on employment, one of the most important variables in this context. To carry out the actual calculations, we will have to obtain the row vector of so-called direct labour input coefficients (indicated by the symbol l in section 8.3), where I shall use the terms 'employment' and 'labour' interchangeably [38]. These input coefficients stand for the quantity of labour per unit of output of the industry concerned. In our case, the elements of this vector are obtained by dividing the entries in the row called 'compensation of employees' by the corresponding entries in the last column (i.e. 'Total') in table A8.1. We find:

l = [0.256, 0.430, 0.274, 0.117, 0.255, 0.355, 0.412, 0.289, 0.219, 0.358, 0.215, 0.640, 0.809, 0.571, 0.387]

For vector l* (see equation (8.5)) we now straightforwardly have:

l* = [0.382, 0.523, 0.387, 0.248, 0.389, 0.462, 0.536, 0.411, 0.369, 0.538, 0.261, 0.719, 0.851, 0.627, 0.468]

That is, taking all effects into account, assuming household consumption is exogenous, an increase of final demand of the first industry of one unit results in an increase of employment of 0.382 units, et cetera.

We also are now able to calculate how much employment can be directly and indirectly related to final demand and its categories. Recalling equation (8.6), we have, after rounding:

$$L = l^*f = 1{,}773.4$$

where L stands for total employment and f stands for total final demand, i.e. $f = f_h + f_e + f_t + f_c$ where f_h stands for the first category of final demand in table A8.1, et cetera. The outcome is not surprising; we find the same figure (including the breakdown per industry) in the table as the row total of the 'compensation of employees' row. Continuing, to obtain the figure for tourism related employment (L_t), we select the (column) vector of tourism export, f_t, to obtain, after rounding:

$$L_t = l^*f_t = 525.6$$

Thus, when measured in terms of relevance for employment on the island, the size of tourism in 1999 equals $525.6/1{,}773.4 = 0.296$ or about 30 percent.

The hotel industry is clearly visible in the breakdown of total employment with respect to tourism (L_t), by far the highest amount, approximately 255 million AFL, is associated with this industry. Also it is clear that hotels and restaurants make up more then 50 percent of tourism related employment. The products mostly consumed by visitors are services. Generally speaking, the production of services is relatively labour intensive. Tourism is important for creating employment.

The above calculations present a picture for the year 1999. Basically, this is a *static* picture, it just informs us how important the four final demand sectors are in terms of employment, taking both direct and indirect effects into account, at a specific point in time. This picture, however, does not inform us in sufficient detail about dynamic possibilities. For example, there is no specific information regarding "best" investment allocations.

Here again, there are several possibilities. We know, for example, that the increase in arrivals may quite well translate into additional people being hired, and thus in a higher disposable income. However, it may also translate into less people being hired additionally, together with higher wages and salaries being paid to the already employed staff, such as, say, for overtime work. Still another possibility involves capacity constraints. If the host country cannot hire additional staff from

its own population, people from abroad will have to be hired. A further complication here may be the –already mentioned- possibility of the existence of various types of "grey" or "black" labour markets. So, further modelling efforts will, most likely, have to address a mixture of institutional constraints and various types of spill over effects.

From the above we can conclude that the economics of a rising number of arrivals can be quite complex. In each particular case, we should realize that further information regarding 'raw' data, reaction patterns, price and output elasticities, et cetera, may be required before appropriate projections can be made. This leads us to another problem that modellers have to confront. The structural context mentioned above can quite easily affect the linearities involved in IO analysis. In fact, this is another instance where non-linearities may easily enter the scene. An example already briefly referred to can be the presence of Engel-curve effects, i.e. a situation where shifts in preferences are associated with shifts in incomes. We already encountered another example, i.e. the presence of capacity constraints in hiring personnel. Let us now return to the Aruba situation proper.

The effect additional wages and salaries, earned from extra arrivals, has on the economy has only partly been determined in the previously mentioned total effect. To obtain a more complete insight, the income earned by households needs to be made endogenous in the IO modelling exercise. This procedure will, evidently, result in higher multipliers. Which particular variant of the various available indicators should be used in actual policy decisions at hand is a matter of further research, and is outside the scope of this study.

For the calculation of induced multipliers for Aruba, I have adjusted the previously presented IO table. The row with compensation of employees has been 'moved up' and made part of the intermediate consumption section. By adding this row the industry 'households' is created. In this way, the row total of 'compensation of employees' denominates the total production of the households. As part of the procedure, the column household and government final consumption has been split in separate columns for household final consumption and government final consumption, based on basic data provided by CBS of Aruba. The column household final consumption is included as the industry 'households' in the table.

A number of additional assumptions are needed when 'households' as an industry is added to the IO table. First of all, households 'produce' compensation of employees (salaries) and 'use' household final consumption. However, households also include own account workers which produce mixed income. For example, part of the mixed income constitutes salaries for the owner. However, we have abstracted from this measure of detail[39]. Secondly, in IO modelling, a relationship between the various intermediate uses is always assumed, which should be quite stable. In line with this, the response on extra income (income elasticity) thus needs

to move in (approximately) the same pattern as the current consumption, so as not to alter the shares. In most cases, overtime is paid more, relatively speaking, which therefore changes the shares. It is assumed that the extra compensation of employees produces the same quantities.

We present Aruba's 16 x 16 matrix of induced multipliers below as table A8.4. The corresponding vector of total backward linkages is given as the final row (under 'total').

Baaijens et al. (1998) present a survey of the results of a meta-analysis (i.e. a study of the outcomes of studies) which includes a list of average tourism income multipliers (ATIMs) for a number of countries. The ATIM is obtained by weighing the income multipliers with the tourism expenditure. For each industry separately we calculate an element of the income multiplier vector. For the ATIM the sum of compensation of employees and operating surplus rows, as given in table A8.1, has been taken. The time period covers selected years in the 1970s and 1980s. The authors present their figures under several caveats in the light of incomplete information regarding the data and the methodologies used in the cited studies. To give an impression of the range in ATIM values, I have chosen from their listing the following countries:

Table 8.11
Average tourism income multiplier for various countries

Country	Average tourism income multiplier
Bahamas	0.782
Bermuda	1.100
Turkey	1.981
Cook Islands	0.430
Tonga	0.420
Okanagan	0.713

Source: Baaijens et al., 1998.

Archer (1982), in an early study, provides other relevant figures. Again, this is basically a meta-study. Nonetheless, it is useful to reproduce some of the figures obtained. For small island economies, the following numbers were found (TIM stands for tourist income multiplier):

Table 8.12
Tourism income multiplier for various countries

Country	Tourism income multiplier
Dominica	1.20
Bermuda	1.03
Hawaii	0.90–1.30
Fiji	0.69
Cayman Islands	0.65

Source: Baaijens et al., 1998.

Again I should stress that also here it is not always clear which definitions and methodologies have been employed. For comparison: TIMs for US states and counties, in another group of studies, tended to be lower, essentially in the range 0.40–0.80. TIMs for UK counties and towns tended to be even lower.

For Aruba, I found the value 0.685 for, as we know, the year 1999. This is an ATIM value calculated employing simple multipliers, i.e. without the induced effects. If we decide to base our ATIM value on the induced effects, a larger value is obtained, i.e. 0.952. So we have:

Table 8.13
Average tourism income multiplier for Aruba

Aruba 1999	Average tourism income multiplier
Simple effects	0.684
Induced effects	0.952

I have pointed out that a diverse range of factors influence an ATIM-value. This means, that utmost care must be applied in deriving and interpreting any value. Given that, an issue for further research is calibrating the figures found, using the same methodology. In this way, the sensitivity of ATIMs for shifts in the determining factors can be further analysed. Additional research also will be necessary to see which of those are dominant in the Aruba case.

It may be useful to briefly discuss other studies in this area. In publications of Cole and Razak (2004) the direct and indirect share of tourism in Aruba was estimated to range from 60 to 65 percent of GDP. Also the WTTC (2008) provides higher estimates of the indirect share of tourism in the Aruba economy in the range of 70 percent. These estimates are markedly higher than the estimates presented in my study. The matter will definitely require additional attention in future research. I would already, however, like to state that it is not entirely clear whether methodologies applied and definitions used are strictly comparable to mine. Also, it is not sufficiently clear whether the distinction between direct, indirect, and induced multiplier effects is as strict as applied by me. An example is the definition of tourism itself. Figures can differ according to differences in distinguishing between inbound and domestic tourism. It should be noted, however, that the percentage presented in my study only concerns inbound tourism. Cole and Razak and the WTTC refer to total expenditure and value-added of tourism, which includes domestic tourism. However, domestic tourism in Aruba is expected to be very small; within the small island of Aruba there are not many places for residents to leave their 'usual environment' and spend money [40].

8.10 Conclusion and final remarks

The Tourism Satellite Account supplies detailed information on various kinds of tourism expenditure. In this chapter, I have shown how the (now) available information can be re-arranged to obtain so-called tourism expenditure or consumption vectors. These vectors subsequently can be incorporated in an input-output table which opens up the possibility of IO analysis of various kinds of tourism. For the small tourism island of Aruba I have described in detail how an IO table with a tourism expenditure vector has been built.

For an early discussion of concepts and issues involved in estimating the effects of targeted policies, I refer to Oosterhaven and Van der Knijff (1987). The authors particularly warn us of one specific pitfall, i.e. the neglect of various types of substitution effects. If one type of touristic consumption (associated, say, with a new beach being developed) implies that the consumption of other types will decline (say those associated with city life), the overall outcome can be that the effects cancel out at the regional or national level, i.e. the higher levels of analysis. In such cases, if focus is too much on one type of developments, the overall effects for the entire region may be quite easily overstated. Multiplier analysis, whether 'simple' or 'total' will then lead to biased projections. However, IO techniques, given their focus on interrelations, in principle provide a structure to capture such substitution effects if the analyst is aware of their existence.

Fletcher (1989) warns that policy makers should be extremely careful in interpreting multiplier values. For example, it is often assumed that an increase in final demand will mean an increase in the demand of, particularly, labour. However, this is only the case if these industries are not operating at full capacity. Another condition is that there should be just sufficient labour around to employ as additional staff. Furthermore, other options, such as meeting increased demand by either better utilization of existing personnel or by increasing over-time can also play a part. In such cases, the multipliers will overestimate the effect of final demand increase.

Notes

[1] Boorsma and Van Venrooy (1996) point out that further economic growth in Aruba in the long term should mainly rely on improving productivity.

[2] In Steenge (1990b) Aruba competitiveness is studied in the context of a globalising world economy. One conclusion of the report is that international agreement on concepts and modelling philosophies is absolutely necessary for any form of international comparison. Koning (1998, p. 6) notes that it would be convenient to have an input-output table available where mutual relationships are made explicit. Croes' study will come back later.

[3] To be discussed in further detail in section 8.3.

4) Strictly speaking, we should use the term "models" because Quesnay presented his Tableau économique (see below) in a number of versions. However, in the context of our discussion we shall employ the term "model" because we only discuss one version (which probably is the most well-known one).

5) This is a theme that we later on shall encounter again in the context of tourism, the benefits of which often also are based on "nature's bounty".

6) Recall that this also was the time of the 'Encyclopédistes', who highly valued the use of scientific tools in addressing social issues.

7) Madame de Pompadour was the king's main courtesan. Interestingly, Quesnay was chief physician of Madame de Pompadour, which implied a delicate position at the court.

8) Note the difference with the concept of an 'industry' that modern IO analysis works with.

9) These avances constitute what may be called the entire stock of land, cattle, legal contracts, et cetera, that are part of the possessions of the farmers class. This 'stock' can be considered as a central variable in the system. In the Tableau the surplus is equal in size to the avances.

10) I should add that standard input-output methodology cannot be applied to solve this question using the Tableau in Phillips' transcription. The Tableau rather is a set of sub-models of socio-economic classes that determine the effects of changes. For a recent reinterpreting and solving the Tableau, see Steenge and Van den Berg (2007).

11) The underlying bargaining and negotiating process is not part of the formal analysis.

12) This is reflected in the strict "duality" of the standard forms of his model, see below.

13) We see that the elements of the final demand vector are 'multiplied' or 'blown-up' by pre-multiplication with the Leontief inverse.

14) See further Takayama (1974) for a number of equivalent mathematical statements regarding the concept of productivity.

15) A distinction should be made between matrix V' having dimensions i x p, while matrix V has dimensions p x i, see the next table.

16) See also section 2.7 of this study for further examples and classifications.

17) In table 8.9 the entry for the product 'real estate services' is left empty. The reason for this is that this product does not constitute consumption but investment. The amount of real estate services can be found in table 4.6 as gross fixed capital formation. The order in the table is the same as presented in the use table except that the goods and construction services are left out.

18) In table 8.10 the entry for the industry 'construction' is left empty. The reason for this is that any construction, also for visitors, constitutes gross fixed capital formation and not consumption. Table 8.10 only includes consumption items. The production of the industry 'financial intermediation' for visitors is estimated to be below 10,000 Aruba florin and is registered therefore as 0.00.

[19] The production of a certain industry does not need to be equal to the corresponding product. For example, the hotel industry also produces 'food serving services; beverage serving services for consumption on the premises'. Therefore, the production of hotels is higher then 'hotel and other lodging services' taken alone.

[20] Many tables are compiled on the basis of tables for previous years; cf. the remarks on the origin of the Statistics Netherlands' IO table in section 8.5.

[21] The output of financial intermediation services not explicitly charged is roughly estimated by the difference between interests received and interests paid. This indirect measure is known as FISIM (financial intermediation services indirectly measured) (SNA93, par 6.124–6.125); see also chapter 4 note 12.

[22] Recall that the island measures only some 30 by 8 kilometres.

[23] The methodology and compilation issues of the table on inbound tourism in Aruba for the year 1999 have been discussed in chapter 4.

[24] Domestic tourism includes various kinds of consumption of resident visitors such as daytrips and overnight stays. The Dutch TSA also includes the domestic portion of outbound tourism consumption in domestic tourism consumption (TSA: RMF, par. 2.62). For instance, the plane tickets bought at KLM for a vacation in the United States are the domestic part of outbound tourism consumption because KLM is a Dutch airline. For IO analysis, visitors with a business motive are excluded from domestic tourism consumption. This is because their expenditures are already included in intermediate consumption of different industries. The exclusion of business tourism in analysis is part of an international debate (see section 3.2). Expenditures on consumer durables and tourism social transfers in kind are also included in the Dutch TSA.

[25] However, in the context of this study I abstract from possible price or geographical effects.

[26] For example, the payment of compensation of employees to non-residents, which is highly relevant for the calculation of the national income, is made visible in this account.

[27] We shall see below that the linkage concept is related to the multiplier concept.

[28] Linkages of the forward type usually are based on output coefficients, which again are based on the stability properties of the sales relations of the industries. Many studies have shown that tourism activities having strong backward linkages with the supplying industries often have much weaker forward linkages (Archer, 1995; Archer and Fletcher, 1996). According to Oosterhaven and Fan (2006) the only potentially significant forward linkage of tourism is of a more abstract nature. They point out that a region that is attractive for tourists usually also will be attractive for residential purposes, or for firms looking for a place that offers the right facilities. Such an effect probably will be relevant at lower spatial levels, and may cancel out at the higher level. However, we may also argue that such an effect, if it is present, rather involves a case of simultaneity (i.e. of tourism increasing and firms settling) which is a consequence of overall safety or security.

29) For this formula and the related ones, see Miller and Blair (1985, section 9.2).

30) Key industries are industries or groups of industries that play a central role in the industrial interdependencies given the criteria of the study at hand.

31) There is a small body of literature on the stability of output coefficients over time. For an early contribution, see Helmstädter and Richtering (1982).

32) Imports then must be recorded separately. See e.g. Fletcher (1989) on such correction methods.

33) The term 'sector' is used here, in the same sense in which I use the term 'industry'.

34) The term 'simple' again refers to the fact that these multipliers are obtained with exogenous households demand.

35) These total household income multipliers are also given by the last row of the matrix of induced multipliers. For these and other relationships, see Miller and Blair (1985, p. 107 and p. 142–143).

36) In including the denominators in the formulae, I have followed Miller and Blair (1985, p. 107–109).

37) The induced effects address the way additional incomes resulting from a rise in arrivals at the island may be spent.

38) Unfortunately, for Aruba there is no information available on the number of jobs using the same definitions, so no indirect effect on this number has been calculated.

39) I want to mention that certain adjustments to the IO table have to be made when making parts of final demand endogenous. However, this is not the focus of the study here, but should be part of future research.

40) As mentioned in chapter 3 of this study, the 'usual environment' is dependent on frequency or distance travelled. The small territory of Aruba also includes view places outside the usual environment. Some residents of Aruba do stay for weekends in resorts on Aruba but the amounts concerned do not add up significantly.

Appendix 8.1

Arguments in favour of the industry approach

We have seen above that the industry by industry IO table is preferred for empirically based research. Thage (2005, pp. 3–4) mentions the following arguments in favor of building an industry by industry table based on the assumption of fixed product sales structures (*verbatim*):

– This approach does not require assumptions that are at odds with what is actually known about the economy from observed data. The type of assumptions needed are not different from those already widely used when compiling economic statistics (i.e. weak assumptions not directly based on economic theory), while the methods chosen are proportionate to the data available.

- The fact that institutional characteristics cannot completely be removed from a SIOT no matter which compilation methods are used, is explicitly recognized in this type of table, underlining its inherent character as an inter-industry table;
- The table preserves to a high degree the micro-macro link so that current national accounts data and detailed basic statistics can be used in combination with the input-output table;
- The approach permits a maximum use of the detailed information in the SUT, and does in general not require supplementary data collection;
- The approach is consistent with some of the well-established quality requirements for official statistics, such as comparability with other types of statistics and transparency of the compilation method and it facilitates the timeliness of the results and the maintenance of comparable time series;
- The approach is resource efficient, and thus supportive of a wider and more frequent
- Compilation of input-output tables internationally;
- It is a "best practice" method used in most of those countries that have over a considerable number of years produced input-output tables as official statistics integrated with their national accounts. There is no single alternative method used internationally, but where basic statistics are based on enterprise units only, country specific methods have in some cases been developed.
- It follows from the above that this type of table is the one most widely used for economic analysis.

He adds (Thage, 2005, pp. 4–5, also *verbatim*):

'A basic principle when compiling statistics is that whenever results of the same or higher utility to the user can be obtained in a less complicated (i.e. more transparent) and/or less resource demanding way, that should be done. When choosing the industry by industry SIOT the two key words are transparency and resource efficiency. This is in particular facilitated by a one-way compilation process rather than successive rounds of iterations, and by the exclusive reliance on the data already in the balanced SUT. The compilation of the SIOT from the SUT is a simple transformation process that does not require additional collection of basic statistics'.

'The compilers and users of input-output tables should always remember that the economy consists of thousands or millions of producing units, of which hardly even two are completely identical, and that there are millions of different products and even more production processes. (This is also noted in SNA93, par. 15.126). In this vein the industry by industry approach avoids the concepts of homogeneous products or production processes, and does not apply any assumptions that are contrary to well established knowledge about the economy. It is furthermore realized that the variability of the primary products within industries is much more important than the variability caused by the existence of secondary production.

Therefore the efforts devoted to special treatment of secondary production should be proportional'.

'There need not be any close relationship between theoretical model assumptions made by analytical users, and the assumptions that form part of the compilation techniques, as the two types of assumptions play quite different roles. In data construction the purpose of assumptions is to make up for shortcomings in the data sources, whereas assumptions are needed in economic theory and analysis to characterize techniques and/or behaviour, and to simplify the real world multiplicity in order to build manageable models. In practice, users will normally take the SIOT for granted, assuming it possesses the broad characteristics mentioned above, and make whatever simplifying assumptions are needed for a particular analytical use. The inherent lack of a precise theoretical interpretation of the data in any IO table does in general not worry analytical users, and the compilers should not be too sensitive on their behalf'.

'This point is reinforced by the fact that in practice all analytical users of input-output tables are implicitly assuming an industry technology, no matter how the tables have originally been compiled. The reason is that even though the cells of a particular row in the SIOT represent different baskets of (more detailed) products, it is in any input-output analysis implicitly assumed that these different baskets are produced with the same input structure. Similarly it can be shown that when SIOTs are compiled on the assumption of a product technology, it must necessarily be assumed that different bundles of more detailed products are produced by identical input structures, thus following the definition of the industry technology. From an analytical point of view the distinction between a product and an industry technology is thus not so clear-cut'.

'In practice the availability and quality of data and their classification in existing basic statistics are not only the starting point, but also the main determinant of the final SIOT, no matter which methods are used in the compilation process. Thus the major part of the data contents (as much as 90–95 percent) of any SIOT will still reflect the structural and institutional characteristics of the units (establishments or enterprises) from which the data were originally collected. Against this background it becomes a rather speculative question to which type of methodological "pure" table the final outcome belongs or which types of tables are best suited for analytical purposes. And this situation permits the compiler to proceed in a pragmatic way, giving priority to transparency of methods and resource efficiency'.
and (Thage, 2005, pp. 5–6):

'A "technology" assumption is a strong assumption in the sense that it is based on a simplified economic theory that cannot be underpinned by the observed statistical data. Sales structure assumptions are weak assumptions as they broadly speaking

only utilize observed sales structures for the reference year. The nature of the latter type of assumption is not different from the assumptions widely used in the editing and grossing-up, et cetera, when compiling other types of official statistics'.

and:

'It should also be noted, that the overall sales share in a row is not based on an assumption, but actually observed. The assumption only concerns the break-down of the individual row elements. Even if this assumption is not fulfilled at the element level this will only marginally affect the analytical properties of the resulting table. [.....] The market share assumption represents the minimum manipulation of data that will lead from the SUT to the SIOT. This was the method generally used to construct SIOTs before the 1968 SNA terminology was introduced, and this is still the preferred method in those countries where IO tables are compiled on a current basis as an integral part of official statistics'.

'Another important advantage of the market share method is that the SIOT can be derived directly from the rectangular supply and use tables, without any intermediate aggregation to square supply and use tables. Consequently, the question of defining characteristic products and making a formal distinction between primary and secondary production does not arise, and as illustrated both in the numerical and empirical examples below this method reduces the aggregation loss of information'.

Appendix 8.2

Table A8.1
Input-output table Aruba, 1999

	Agriculture, hunting, forestry; Fishing;	Mining and quarrying	Manu-facturing
	mln Aruba florin		
Agriculture, hunting, forestry; Fishing;	0.34	0.00	2.86
Mining and quarrying	0.00	0.00	0.00
Manufacturing	0.93	0.17	16.12
Electricity, gas and water supply; Manufacture of refined petroleum products	1.20	0.07	3.62
Construction	0.04	0.02	0.13
Wholesale and retail trade; Repair of motor vehicles and household goods	2.26	0.31	31.51
Hotels	0.00	0.00	0.00
Restaurants	0.02	0.01	0.44
Transport, storage and communications	0.62	0.30	5.74
Financial intermediation	0.73	0.06	3.45
Other business activities	0.99	0.34	12.33
Public administration; Compulsory social security;	0.01	0.00	0.12
Education	0.00	0.00	0.20
Health and social work	0.01	0.00	0.00
Other community, social and personal service activities	0.09	0.01	0.41
Total	7.24	1.29	76.93
Imports	5.61	1.31	77.04
Taxes on production and imports less subsidies	0.55	0.09	8.33
Total	13.39	2.69	162.30
Total output at basic prices	22.35	5.06	271.23
Total gross value added at basic prices	8.96	2.37	108.93
Other taxes less other subsidies on production	0.08	0.03	0.76
Compensation of Employees	5.73	2.17	74.29
Operating surplus/ mixed income, gross	3.15	0.17	33.88

Electricity, gas and water supply; Manufacture of refined petroleum products	Construction	Wholesale and retail trade; Repair of motor vehicles and household goods	Hotels	Restaurants	Transport, storage and communications	Financial intermediation
0.08	8.43	0.02	2.17	0.67	0.08	0.01
0.08	4.81	0.00	0.00	0.00	0.00	0.00
31.23	37.97	9.30	15.33	19.62	5.03	1.25
135.15	1.33	13.64	40.69	6.87	18.43	0.88
4.68	41.82	0.80	2.63	0.34	1.55	0.44
48.87	58.05	40.19	26.36	25.82	16.47	1.99
0.00	0.00	0.00	8.19	0.00	1.67	0.00
2.19	0.42	2.84	0.93	0.43	6.87	1.09
10.56	3.72	17.21	20.80	3.74	110.31	9.16
16.62	8.12	45.90	15.88	7.19	23.17	76.86
46.07	8.49	37.72	21.93	13.21	45.09	12.36
0.17	0.13	2.46	1.18	0.22	0.30	0.30
1.10	0.18	0.99	0.71	0.21	0.31	0.13
0.03	0.01	0.08	0.05	0.01	0.12	2.21
0.58	1.34	0.89	4.05	1.64	0.94	0.17
297.38	174.81	172.03	160.92	79.97	230.33	106.85
240.33	174.91	93.85	110.10	67.39	87.38	28.11
18.07	17.96	6.27	8.41	10.25	12.00	3.03
555.78	367.69	272.15	279.43	157.60	329.71	138.00
735.77	541.15	669.46	490.52	256.17	560.73	287.21
179.99	173.46	397.31	211.09	98.57	231.02	149.21
1.21	0.46	6.28	3.01	0.44	1.76	1.18
85.7	138.14	238.06	202.27	74.05	123.33	102.65
93.08	34.86	152.97	5.81	24.08	105.93	45.38

Table A8.1 (end)
Input-output table Aruba, 1999

	Other business activities	Public administra-tion; Compul-sory social security;	Educa-tion	Health and social work
mln Aruba florin				
Agriculture, hunting, forestry; Fishing;	0.04	1.84	0.01	0.26
Mining and quarrying	0.00	0.00	0.00	0.00
Manufacturing	4.01	3.61	0.60	2.98
Electricity, gas and water supply; Manufacture of refined petroleum products	6.93	10.03	0.37	2.38
Construction	3.05	5.04	0.33	0.23
Wholesale and retail trade; Repair of motor vehicles and household goods	8.16	6.43	1.12	5.58
Hotels	0.00	0.00	0.00	0.00
Restaurants	1.88	1.74	0.17	0.49
Transport, storage and communications	13.29	6.98	1.17	1.95
Financial intermediation	16.17	6.25	0.88	1.94
Other business activities	35.07	34.16	1.29	3.34
Public administration; Compulsory social security;	0.40	8.74	0.64	0.07
Education	0.82	0.67	1.94	0.31
Health and social work	0.04	0.09	0.01	0.16
Other community, social and personal service activities	2.06	3.37	0.47	0.65
Total	91.91	88.95	9.00	20.33
Imports	55.25	34.80	3.43	20.71
Taxes on production and imports less subsidies	3.34	2.32	0.32	1.54
Total	150.51	126.07	12.75	42.59
Total output at basic prices	737.01	423.13	117.09	142.89
Total gross value added at basic prices	586.50	297.06	104.34	100.30
Other taxes less other subsidies on production	2.89	0.21	0.12	0.56
Compensation of Employees	157.53	270.71	94.56	81.71
Operating surplus/ mixed income, gross	426.08	26.14	9.66	18.03

Other community, social and personal service activities	Total	Household and government final con-sumption	Regular export	Tourism export	Gross capital formation	Total
0.21	17.02	4.60	0.04	0.48	0.21	22.35
0.00	4.89	0.08	0.01		0.08	5.06
8.59	156.76	55.89	16.82	24.30	17.46	271.23
7.63	249.22	119.28	360.70	6.12	0.45	735.77
1.08	62.19	19.43	3.00		456.53	541.15
14.12	287.23	136.20	43.67	133.63	68.73	669.46
0.00	9.86	4.39	0.00	476.27	0.00	490.52
1.67	21.17	72.44	0.00	162.56	0.00	256.17
7.04	212.60	76.03	141.75	130.22	0.13	560.73
6.52	229.73	54.13	3.35	0.00	0.00	287.21
14.93	287.31	352.70	52.69	43.81	0.50	737.01
0.50	15.22	407.91	0.00		0.00	423.13
0.78	8.35	108.74	0.00		0.00	117.09
0.50	3.32	137.97	1.60		0.00	142.89
2.23	18.88	144.44	0.00	151.58	0.00	314.90
65.80	1,583.75	1,694.23	623.63	1,128.97	544.09	5,574.67
47.45	1,047.68	524.52	535.20	125.90	376.89	2,610.19
5.41	97.88	57.57	14.26	37.52	31.23	238.46
118.66	2,729.31	2,276.32	1,173.09	1,292.39	952.21	8,423.32
314.90						5,574.67
196.24						2,845.36
18.82						37.81
122.47						1,773.37
54.95						1,034.18

Table A8.2
A-matrix Aruba 1999 (15 x 15)

	Agriculture, hunting, forestry; fishing	Mining and quarrying	Manufacturing	Electricity, gas and water supply; manufacure of refined petroleum products	Construction	Wholesale and retail trade; repair of motor vehicles and household goods
Agriculture, hunting, forestry; fishing	0.015	0.000	0.011	0.000	0.016	0.000
Mining and quarrying	0.000	0.000	0.000	0.000	0.009	0.000
Manufacturing	0.042	0.034	0.059	0.042	0.070	0.014
Electricity, gas and water supply; manufacture of refined petroleum products	0.054	0.014	0.013	0.184	0.002	0.020
Construction	0.002	0.004	0.000	0.006	0.077	0.001
Wholesale and retail trade; repair of motor vehicles and household goods	0.101	0.061	0.116	0.067	0.107	0.060
Hotels	0.000	0.000	0.000	0.000	0.000	0.000
Restaurants	0.001	0.002	0.002	0.003	0.001	0.004
Transport, storage and communications	0.028	0.059	0.021	0.014	0.007	0.026
Financial intermediation	0.033	0.012	0.013	0.023	0.015	0.068
Other business activities	0.044	0.067	0.045	0.063	0.016	0.056
Public administration; compulsory social security	0.000	0.000	0.000	0.000	0.000	0.004
Education	0.000	0.000	0.001	0.002	0.000	0.001
Health and social work	0.000	0.000	0.000	0.000	0.000	0.000
Other community, social and personal service activities	0.004	0.002	0.002	0.001	0.002	0.001
Direct backward linkages[1]	0.324	0.256	0.283	0.405	0.323	0.256

[1] As given by equation (8.11).

Table A8.3
Multipliers for Aruba 1999 15 x 15, households exogenous

	Agriculture, hunting, forestry; fishing	Mining and quarrying	Manufacturing	Electricity, gas and water supply; manufacure of refined petroleum products	Construction	Wholesale and retail trade; repair of motor vehicles and household goods
Agriculture, hunting, forestry; fishing	1.016	0.001	0.011	0.001	0.018	0.000
Mining and quarrying	0.000	1.000	0.000	0.000	0.010	0.000
Manufacturing	0.052	0.040	1.068	0.059	0.085	0.019
Electricity, gas and water supply; manufacture of refined petroleum products	0.074	0.024	0.024	1.231	0.011	0.030
Construction	0.003	0.005	0.001	0.009	1.084	0.002
Wholesale and retail trade; repair of motor vehicles and household goods	0.125	0.077	0.138	0.099	0.140	1.073
Hotels	0.000	0.000	0.000	0.000	0.000	0.000
Restaurants	0.003	0.004	0.003	0.005	0.002	0.006
Transport, storage and communications	0.046	0.081	0.037	0.031	0.020	0.042
Financial intermediation	0.065	0.032	0.037	0.053	0.041	0.107
Other business activities	0.069	0.087	0.066	0.095	0.036	0.076
Public administration; compulsory social security	0.001	0.000	0.001	0.001	0.001	0.004
Education	0.000	0.000	0.001	0.002	0.001	0.002
Health and social work	0.001	0.000	0.000	0.000	0.000	0.001
Other community, social and personal service activities	0.005	0.003	0.002	0.002	0.003	0.002
Total backward linkages[1]	1.461	1.356	1.391	1.590	1.452	1.364

[1] As given by equation (8.13)

Hotels	Restaurants	Transport, storage and communications	Financial intermediation	Other business activities	Public administration; compulsory social security	Education	Health and social work	Other community, social and personal service activities
0.004	0.003	0.000	0.000	0.000	0.004	0.000	0.002	0.001
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.031	0.077	0.009	0.004	0.005	0.009	0.005	0.021	0.027
0.083	0.027	0.033	0.003	0.009	0.024	0.003	0.017	0.024
0.005	0.001	0.003	0.002	0.004	0.012	0.003	0.002	0.003
0.054	0.101	0.029	0.007	0.011	0.015	0.010	0.039	0.045
0.017	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000
0.002	0.002	0.012	0.004	0.003	0.004	0.001	0.003	0.005
0.042	0.015	0.196	0.032	0.018	0.017	0.010	0.014	0.022
0.032	0.028	0.041	0.268	0.022	0.015	0.008	0.014	0.021
0.045	0.052	0.080	0.043	0.048	0.081	0.011	0.023	0.047
0.002	0.001	0.001	0.001	0.001	0.021	0.005	0.000	0.002
0.001	0.001	0.001	0.000	0.001	0.002	0.017	0.002	0.002
0.000	0.000	0.000	0.008	0.000	0.000	0.000	0.001	0.002
0.008	0.006	0.002	0.001	0.003	0.008	0.004	0.005	0.007
0.328	0.313	0.410	0.373	0.125	0.210	0.077	0.142	0.208

Hotels	Restaurants	Transport, storage and communications	Financial intermediation	Other business activities	Public administration; compulsory social security	Education	Health and social work	Other community, social and personal service activities
0.005	0.004	0.001	0.000	0.000	0.005	0.000	0.002	0.001
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.043	0.087	0.018	0.009	0.008	0.014	0.007	0.025	0.034
0.111	0.040	0.055	0.009	0.014	0.034	0.006	0.024	0.035
0.008	0.003	0.005	0.003	0.005	0.014	0.003	0.002	0.005
0.077	0.125	0.050	0.016	0.017	0.026	0.013	0.049	0.058
1.017	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000
0.004	1.003	0.016	0.006	0.003	0.005	0.002	0.004	0.007
0.064	0.030	1.255	0.057	0.026	0.027	0.015	0.022	0.035
0.063	0.057	0.082	1.373	0.036	0.030	0.014	0.027	0.040
0.071	0.074	0.119	0.070	1.057	0.096	0.016	0.034	0.063
0.003	0.002	0.001	0.002	0.001	1.021	0.006	0.001	0.002
0.002	0.001	0.001	0.001	0.001	0.002	1.017	0.002	0.003
0.001	0.001	0.001	0.011	0.000	0.000	0.000	1.001	0.002
0.009	0.007	0.003	0.001	0.003	0.009	0.004	0.005	1.008
1.477	1.433	1.610	1.559	1.172	1.283	1.103	1.199	1.291

Table A8.4
Induced multipliers Aruba 1999 (16 x 16)

	Agri-culture, hunting, forestry; fishing	Mining and quar-rying	Manu-factu-ring	Electri-city, gas and water sup-ply; ma-nufacture of refined petroleum products	Con-struc-tion	Wholesale and retail trade; repair of motor vehicles and household goods
Agriculture, hunting, forestry; fishing	1.018	0.003	0.013	0.002	0.020	0.003
Mining and quarrying	0.000	1.000	0.000	0.000	0.010	0.000
Manufacturing	0.076	0.073	1.092	0.075	0.110	0.048
Electricity, gas and water supply; manufacture of refined petroleum products	0.121	0.089	0.072	1.262	0.059	0.088
Construction	0.010	0.015	0.009	0.014	1.092	0.011
Wholesale and retail trade; repair of motor vehicles and household goods	0.179	0.152	0.193	0.134	0.195	1.138
Hotels	0.001	0.002	0.001	0.001	0.001	0.002
Restaurants	0.024	0.033	0.025	0.019	0.024	0.032
Transport, storage and communications	0.080	0.127	0.071	0.053	0.054	0.082
Financial intermediation	0.100	0.081	0.073	0.076	0.076	0.149
Other business activities	0.186	0.248	0.185	0.172	0.156	0.217
Public administration; compulsory social security	0.008	0.010	0.008	0.005	0.008	0.013
Education	0.003	0.004	0.004	0.004	0.004	0.005
Health and social work	0.005	0.006	0.004	0.003	0.004	0.006
Other community, social and personal service activities	0.041	0.052	0.039	0.025	0.040	0.046
Household consumption	0.490	0.671	0.497	0.319	0.501	0.593
Total	2.344	2.566	2.287	2.166	2.356	2.433

	Hotels	Restaurants	Transport, storage and communi- cations	Financial interme- diation	Other business activities	Public admini- stration; compul- sory social security	Education	Health and social work	Other community, social and personal service activities	House- hold consump- tion
	0.008	0.006	0.002	0.003	0.001	0.008	0.004	0.005	0.003	0.005
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	0.076	0.113	0.041	0.043	0.024	0.059	0.060	0.065	0.063	0.063
	0.177	0.091	0.101	0.076	0.046	0.123	0.111	0.102	0.093	0.124
	0.018	0.010	0.012	0.013	0.010	0.028	0.019	0.014	0.013	0.019
	0.153	0.183	0.103	0.093	0.054	0.129	0.134	0.139	0.125	0.143
	1.019	0.002	0.005	0.002	0.001	0.003	0.003	0.002	0.002	0.004
	0.034	1.027	0.037	0.037	0.018	0.046	0.050	0.040	0.033	0.057
	0.111	0.066	1.287	0.105	0.049	0.090	0.089	0.077	0.076	0.088
	0.112	0.095	0.116	1.423	0.060	0.096	0.092	0.085	0.083	0.092
	0.236	0.201	0.232	0.235	1.136	0.317	0.276	0.227	0.207	0.307
	0.013	0.009	0.008	0.011	0.005	1.034	0.021	0.012	0.010	0.018
	0.006	0.004	0.004	0.005	0.003	0.007	1.023	0.007	0.006	0.007
	0.006	0.005	0.005	0.016	0.003	0.008	0.009	1.008	0.007	0.010
	0.060	0.046	0.038	0.052	0.028	0.077	0.085	0.065	1.052	0.095
	0.687	0.530	0.476	0.692	0.333	0.924	1.088	0.807	0.603	1.284
	2.716	2.388	2.468	2.806	1.773	2.948	3.064	2.654	2.378	2.315

9. *Conclusions and outlook*

9.1 *Introduction*

This study started with the presentation of the System of National Accounts. The System of National Accounts has been established as a major macroeconomic framework after the Second World War, although the first calculations date back to the 17th century. Macroeconomic indicators, which result from this framework, are being used for different purposes, such as determining the Marshall aid for each of the Western European countries just after the Second World War, and contributions to international organizations nowadays. The SNA framework consists of concepts, definitions and accounting rules which are flexible enough to fit various kinds of countries. However, the SNA does not allow the introduction of alternative concepts and accounting rules in the main body of its framework. The main body of the SNA consists of supply and use tables and institutional sector accounts. For the purpose of investigating and estimating other aspects in an economy, such as environmental aspects, social-economics and tourism, satellite accounts have been developed. These satellite accounts contain links with the main framework and, on the other hand, allow for the introduction of alternative concepts and accounting rules, which diverge from the main framework.

The Tourism Satellite Account (TSA) framework is a satellite account of the national accounts in the area of tourism. Tourism is a demand driven concept. The characteristics of the consumer determine if the goods and services consumed and/or produced belong to tourism and should therefore be included in tourism calculations and estimations. The TSA framework consists for a large part of the same concepts, definitions and accounting rules as the main body of the SNA, but deviates from the SNA in the establishment of a tourism industry and tourism sector in an extension of the TSA framework that I have developed in this study. The TSA framework consists of a set of ten different tables. These tables address different aspects of tourism, such as tourism consumption, tourism supply, tourism employment, tourism investment and tourism collective consumption. The compilation of this set of tables, and especially the matching of (or confrontation of information on) tourism supply with tourism consumption (demand), measures certain basic aspects of tourism, such as tourism value added, tourism employment and tourism production. These tourism indicators are related to other macro-economic indicators, such as the share of tourism in total value added and the total supply of tourism in the economy. The basic understanding of the role that tourism plays in an economy is gained from these statistics. Before the establishment of the TSA, statistics on tourism have mainly been focused on numbers of arrivals, overnight stays and occupancy rates. These statistics cannot be directly linked to

economic statistics expressed in monetary values. Policy makers and decision takers did not have a good idea of the magnitude of tourism in their economy. The introduction of the TSA has meant a great improvement.

This study started with the following central question:

How should an accounting system be structured that can provide answers on tourism policy at the national and sub-national level?

The TSA framework is the result of an international debate on tourism statistics. In the current TSA framework, which consists of a set of ten tables, a spectrum of relevant variables on tourism has been covered. The variables presented in the set of ten TSA: RMF recommended tables are located in the area of production, consumption, employment, investment and collective consumption. Evaluating the TSA, I consider this framework a valuable contribution to the range of economic statistics available. I think the estimation of tourism consumption and production are extremely interesting for policy, planning and analysis purposes. Important variables, such as tourism value added and tourism employment, are part of the current TSA framework.

However, I have also found that improvements to the TSA can be made. Certain parts of the current TSA framework are still under development. First of all, the current framework includes tables which need some more methodological consideration. The measurement of tourism investment and tourism collective consumption is a relatively new territory, as the main development efforts have been focused on the estimation of tourism supply and consumption by industry and product category. The measurement of tourism investment (chapter 5) and tourism collective consumption (chapter 6) has been tried for the Netherlands and has resulted in a number of suggestions and recommendation for improving the methodology for the estimation of these concepts.

In this study I have not suggested extending the set of tables of the TSA framework with additional tables. I found that the TSA framework has an adequate number of tables or could even lose the tables on tourism investment and tourism collective consumption. The main economic aspects of tourism have already been addressed in the TSA framework. The TSA framework has one table on employment in tourism. In this area extra tables could prove valuable. However, there already is a complete extension constructed with a wide range of tables on various aspects of employment in tourism (OECD, 2000).

Secondly, I think that it is an advantage if tourism statistics are placed in a broader context. This can be done by linking tourism to other industries in the economy.

The set of ten tables consists of some statistics directly connected to each other, such as tourism supply and tourism consumption. Tourism supply and tourism consumption are matched, which results in an estimation of the contribution of tourism in the economy. Other statistics, such as tourism employment with compensation of employees (wages and salaries) paid for the production of tourism goods and services, are only partly connected to other tourism statistics through a calculation. Finally, some TSA statistics are not connected at all to any of the other statistics, such as tourism investment and tourism consumption. In chapter 7 of this study I introduced an extension of the TSA framework to an institutional approach. This extension places the measurement of the role of tourism in the context of the institutional sector accounts. The analysis of tourism does not have to stop with the basic TSA framework.

The advantage of the institutional approach is that the connection between parties in an economy is visible. This notion of connectedness between variables, which is imbedded in the National Accounting framework, should not be underestimated. I dare say that this is one of the main selling points of the System of National Accounts, apart from the advantages and the improvement of estimations offered by the confrontation of data in this system. An example of a relevant relationship between economic variables made visible in the SNA: are interest payments and loans. If the loan amounts increase, it is reasonable to expect the future interest payments on loans to increase.

I have introduced this notion of connectedness in the TSA framework. The relationship between tourism and other parties in the economy and abroad are made explicit. The flow of money earned in tourism is easy to trace from transaction to transaction, in the institutional sector accounts adjusted for tourism. This means that, for instance, the financing of investment in tourism by other countries can be seen. This framework goes beyond the basic TSA framework which is presented in the TSA: RMF manual. A set of individual unrelated indicators is not as powerful as a set of related indicators, which are based on a framework and include interactions.

The usefulness of the TSA depends on the country and the role tourism plays in this country. Countries with little economic diversification and a large share of GDP and employment in tourism follow a different strategy from countries with a highly diversified economy and a small share of tourism in GDP and employment. Developing and following a strategy in tourism for these different kinds of countries, brings to light different kinds of needs for tourism statistics. Countries with relatively little tourism in their economy do not depend on tourism information for their strategy. Tourism in these countries is not specifically addressed, but follows the general development outline like many other industries of the same size. Tourism statistics have to facilitate policy making and decision taking. Tourism dependent countries need more extensive information on tourism and on various

aspects related to tourism. The information has to be placed in a context, i.e. in a framework which is linked.

The TSA framework has to be attuned to the statistical needs of the policy makers, decision takers and other stakeholders in the country and the data possibilities offered in the countries. A need for extensive statistics may not be compatible with a limited budget and small statistical base in a country. The optimal balance has to be found, taking into account the needs and the data capabilities of the country of reference. This consideration should be independent from the desires of extraterritorial organisations or other governments. The application of the different parts of the TSA framework should follow the same general rule used for the application of the System of National Accounts. Depending on the needs and restrictions, the most appropriate tables and approaches should be selected and applied, leaving the remaining ones as they are. These are steps towards a more ideal TSA as I see it. Developing statistics for which there is limited interest, or where the costs and efforts do not meet the results, should be avoided.

In chapter 8 of this study I have shown some modelling exercises, using TSA statistics and an input-output framework. The impact tourism has on the Aruba economy, and on employment specifically, is informative, and illustrates the usefulness of modelling with TSA data. However, TSA data can also be used in other modelling tools, such as CGE and econometric models. The input-output exercise was only meant to show possible applications of TSA data. With the extension of the TSA framework and the further development of TSA statistics, modelling possibilities and applications are expected to increase.

I conclude that the current set of ten tables in the TSA framework, and especially the tables on tourism consumption and production, are a good start. This set of tables supply ample information to feed into a modelling exercise. For countries dependent on tourism the institutional approach facilitates a more in-depth analysis of money flows related to tourism.

In the end it depends on the statistical needs of a country which parts of the TSA will be produced and if any extensions are needed. The following question should be answered to determine how much a country should invest in tourism statistics: Is tourism a considerable industry which deserves special attention, or is tourism a marginal industry of no particular interest for policy making?

9.2   Choices

Policy makers have to make choices. For every choice, scarce resources such as land, capital and labour are used. The use of these scarce resources limits the future

choices policy makers and decision takers can make. Decisions concerning tourism are not an exception. In tourism, the allocation of scarce resources and the consequences of choices are expressed in, for instance, taking up space for tourism infrastructure, such as hotels, resorts and airports, environmental pressure on sights of interest, and the use of resources, such as clean water and electricity by visitors. Tourism has other impacts on an economy and country, apart from its earning power. More space used for resorts means, for instance, that less space on beaches is available for the local population. The decision for the construction of additional tourism infrastructure, such as a hotel or tourism resort has to take into account the reduction of beach access for the local population. These costs associated with making choices bring about opportunity costs. A choice for one project or group of people may mean less for something or somebody else. Scarce resources can only be allocated once.

In the introduction and the previous chapters, the advantage of the TSA being related to the System of National Accounts has been pointed out. This connection enables tourism statistics to be placed in a broader context, such as those of macroeconomic statistics. There are some other satellite accounts which are linked to the System of National Accounts, such as environmental accounts and Social Accounting Matrix (SAM). These accounts supply environmental information or socio-economic information on an economy or country. These satellite accounts can be linked to the TSA through the common link with the SNA. The SNA is the central key between the different satellite accounts.

The link with SNA makes the TSA a more powerful framework, because now there is a way to show the environmental impacts of tourism in a country. However, this is less straight forward as it seems. Some concepts and accounting rules in the two satellite accounts can differ and have to be adjusted, before the two frameworks can be connected. The application of environmental and social statistics in relation to tourism statistics has not been part of this study. This is a door which has been left ajar, that could be opened completely as part of future research.

I want to devote some words to the choice of the model used in this study, namely Leontief's IO model. As we have seen, I compiled an additional final demand vector, i.e. the consumption package associated with foreign arrivals. IO models pay less attention to other factors in the TSA tables, such as price effects and the collective product 'security'. In this respect, support for this modelling choice comes from other directions. Croes (2000), for example, offers a detailed study of demand factors for Aruba. He investigated the impact of changes in three types of factors, i.e., respectively, the incomes in the homelands of tourists in three countries (i.e., the United States of America, Venezuela and the Netherlands), price related variables, and exchange rate effects. The study showed that incomes in the countries the tourists come from are by far the most important ones in this setting, price and

exchange rate effects are significantly less important. Other relevant factors such as the "image" of the host land in foreign countries also are important, but will need further attention. Particularly the role of factors such as 'security' and political stability will need further investigation.

The outcome of Croes' study can be seen as supporting the line I have adopted in this study. The dominant role of tourism demand in a selected number of countries is reflected in the central role the IO model attributes to demand factors of the type focused on. Another point in Croes' study was the fact that studies are often based on relatively small samples and characterized by a lack of detail. Here I can state that studies of the type presented here, uniting the fundamental elements of national accounting and the field of structural economics, are an answer to this, in offering both an enlarged scope and an eye for the desired detail.

In chapters 1 and 8 I pointed out that studies like mine force the researcher to contemplate the type of model she/he would like to employ. In this study, I have chosen an approach that focuses on structural economics. In this approach, the economic structure of the country or region of study is given a central place. This way of looking at the problem at hand has classical roots.

As said, I opted for an IO model. Such a model offers a complete picture of the economy of the country of study, strictly based on observable quantities and relations. Patterns of production and consumption are placed within a tested framework, based on the circular flow principle. Particularly the close relation with the national accounting system guarantees a close relationship with economic reality. Methodological objections, such as an overemphasis on so-called fixed coefficients (in production or consumption relations) cannot be accepted any more. Nowadays IO models are explicitly designed to capture the idea that physical structures do not respond automatically to changes in prices, as in many types of neo-classical origin. That is, to give an example, substitution reactions by any of the parties concerned is not automatically built-in as a reaction based on some kind of optimizing behaviour (Duchin, 1998).

For a country like Aruba, later studies will have to deal with what we have called 'structure' in a profound and detailed way. The island will be faced with hard choices regarding its identity. Will it basically focus on, or further develop, its tourism activities, or will it develop in other ways. Here the classical idea of a driving force or 'motor' in society will resurface again. In chapter 8 some attention is paid to Quesnay's Tableau économique and the school of thought the Tableau belongs to, the Physiocrats. As seen, this school attributed an important role to agriculture, the ultimate source of value being nature's bounty. These views had a strong *normative* content in that agriculture was seen as the source of prosperity. Squandering this source inevitably would have serious consequences for the

wellbeing of the country as a whole. Apparently, if we replace the term 'agriculture' by terms like 'tropical paradise', 'splendid beaches', or 'friendly island', we are back to the notion of core values that should be approached with extreme care. As indicated, methodological frameworks based on 'structural economics' offer an promising framework for addressing complex issues of this nature.

We can ask ourselves whether notions such as these should be revived. That is, an update of those notions where we think of nature or natural resources as the ultimate source of value for an economy. For many economies in the island states of the Caribbean this is something to consider. In that case, the old physiocratic maxim of keeping intact nature's given resources can be revived. This would also imply that some kind of "ideal state" or "ideal development path" should be defined, including a new way of dealing with change.

In the same line, capturing and preserving cultural elements may become a major factor. Here in any case, there are strong links with concepts involving receptiveness and hospitality issues (Cole, 1993; Razak, 2007).

9.3   Outlook

The answer to the final question 'where are we now?' invites considering other areas of developing or improving economic statistics on tourism. In the discussion on the concepts, definitions and accounting rules of the TSA framework some methodological difficulties have been pointed out, such as the concept of usual environment and business travel. I have tried to illustrate the different ways of looking at these issues and showed some examples on how to use these concepts in specific circumstances. However, for statistics to be comparable, especially between countries, it is important that concepts are applied in the same way everywhere. Some additional guidelines for the interpretation of the concept of usual environment would be most valuable in this sense. On the other hand, it is understandable that certain concepts and definitions are defined with a certain flexibility to facilitate their use by very different countries. The current revision of the TSA: RMF manual and introduction of another manual should supply addition methodological support.

The TSA: RMF set of recommended tables associated with production and consumption, tourism employment and non-monetary tourism indicators have been compiled by most countries. The tables on tourism investment and tourism collective consumption are usually not constructed when countries start implementing the TSA framework in their statistical process.

It is recommended that the methodology for the compilation of each table matures. This is encouraged by applying the methodology in various circumstances and

diverse cases. This study has shown that the methodology on estimating tourism investment and tourism collective consumption partly needs to be rethought and applied in practice to learn and improve the methodology. Further production of these two tables should be postponed until the methodological issues have been addressed and the usefulness of these tables has been determined.

I extended the TSA framework towards institutional sector accounts. In this way tourism is approached from a different direction and includes perspectives otherwise not available. In the literature some other extensions of the TSA have also been presented, such as an activity approach towards tourism and a tourism employment module. In the first extension, instead of industries, activities on a lower level of aggregation are used to show production and intermediate use. I have not found a direct use for this approach, as no more detail was required than the industry level which was also sufficient for the input-output approach. However, there may be cases to which an activity approach is better suited and in those cases this extension may prove valuable.

The employment module has been tried in a number of countries such as Austria. The OECD manual (2000) addresses this module extensively and presents some case studies as well. For more insight in the employment or labour aspect of tourism this employment module may prove valuable and can be recommended for use. As for the TSA tables, the most appropriate tables of the employment module should be selected for compilation depending on the needs of the country or region.

In a number of countries, regional versions of the tables of the SNA are compiled. Regional accounts establish a partitioning of national statistics into predefined areas, i.e. regions. This partitioning in economic areas allows for conducting region specific policy and planning. Regional TSAs have been developed and are already compiled for countries such as the United Kingdom, Denmark and Canada (Barber-Dueck and Kotsovos, 2003; Jones, 2004). Countries with a concentration of tourism in certain areas use these regional TSAs to gain insight into the particular needs of the tourism regions. Policy and planning can be adjusted to fit the needs of the region. The accounts consist of tourism statistics, such as the composition of industries active in tourism in the region and employment in tourism.

Further modelling efforts will be required. Cole (2007), in a recent review article, points out the relevance of regional science methods and techniques for tourism studies. A major reason is the geographical component, which is especially important in analyzing the relation between the national level and the local one. One of the contributing issues is domestic tourism which, especially in developing countries, can be expected to rise rapidly in the near future. An underlying factor here is the observation that tourism may soon turn into a basic commodity, inelastic in the long run at the global level. In fact, within a relatively short time we may

expect that domestic tourism will outstrip international arrivals by a wide margin. Capturing this effect will ask for analytical tools that are especially tuned to the role of forecasting in policy studies.

In the introduction I pointed out the importance of the relationship between tourism and the environment. Tourism development cannot be seen separate from the environment which includes the tourism attractions, such as the coastline and forest, and use of natural resources such as water and land. The TSA is part of the SNA, which facilitates the connection between tourism statistics and environmental statistics (see Ortúzar and Ortúzar, 2006; Gallego Galan, and Moniche Bermejo, 2006; Diaz, 2006 and Barber-Dueck and Kemp, 2006). In the same way as the connection between the TSA and environmental accounts is made, other satellite accounts can also be linked with the TSA. In the social domain, the TSA can be related with the social accounting matrix (SAM).

Nederlandstalige samenvatting

Het fenomeen toerisme heeft de afgelopen decennia voortdurend aan betekenis gewonnen. Onder invloed van de toenemende welvaart en het stijgend aanbod van reismogelijkheden is het aantal jaarlijkse reisbewegingen sterk gestegen. Het verschijnsel is mondiaal, hetgeen betekent dat in vele landen moet worden nagedacht over de implicaties ervan. Dit impliceert tevens de noodzaak om greep te krijgen op de aard en de omvang van toerisme. De beschikbaarheid van goede statistieken is daarbij van groot belang. Immers, voor het voeren van beleid op vrijwel elk gebied zijn uitgebreide en relevante statistieken nodig. Een belangrijk deel van het beleid richt zich op de economische aspecten waarvoor actuele economische statistieken onontbeerlijk zijn. Ook is het belang gestegen van internationale vergelijkbaarheid en coördinatie, en daarmee de interesse in internationaal aanvaarde statistieken. Op dit punt is de kernvraag van deze studie dan ook toegespitst, namelijk: 'hoe zou een statistisch raamwerk eruit moeten zien dat beleidsmakers van voldoende informatie voorziet om doelmatig beleid te kunnen voeren op het gebied van toerisme?'.

Hiermee komt het huidige systeem van nationale rekeningen (NR) in beeld. Dit systeem geeft een kwantitatieve beschrijving van het economische proces binnen een land en de economische relaties met het buitenland. De NR vormen een samenhangend en geïntegreerd stelsel dat de basis is voor internationaal geharmoniseerde economische statistieken. Het bruto binnenlandsproduct (bbp) en de besparingen per hoofd van de bevolking zijn twee voorbeelden van macro-economische indicatoren die berekend worden op basis van de NR.

De NR bestaan uit een kernset van tabellen en daarnaast een aantal satellietrekeningen. De kernset wordt gevormd door de zogeheten aanbod- en gebruiktabellen en de institutionele sectorrekeningen. De aanbod- en gebruiktabellen bevatten ondermeer informatie over de productie en het gebruik van goederen en diensten binnen een economie. Antwoorden op vragen over, bijvoorbeeld, de opbrengsten van de bouwnijverheid, horeca of financiële instellingen in een land kunnen direct uit de aanbod- en gebruiktabellen worden afgeleid. De institutionele sectorrekeningen beschrijven de economie als een reeks onderling samenhangende deelprocessen. De onderscheiden deelprocessen zijn achtereenvolgens: productie, inkomensvorming, primaire en secundaire inkomensverdeling, inkomenbesteding, herverdeling door kapitaaloverdrachten, kapitaalvorming en financiering. Naast deze kernset van aanbod- en gebruiktabellen en sectorrekeningen bestaan de NR uit zogeheten satellietrekeningen. In deze satellieten worden specifieke deelterreinen, beschreven in aansluiting op de NR, vaak gekenmerkt door een gedeeltelijk eigen methodologie. Voorbeelden zijn het milieu, de landbouw en sinds kort ook het toerisme. De structuur van de NR wordt behandeld in hoofdstuk 2.

De reden dat de toerismestatistieken in een eigen satelliet zijn samengebracht, is omdat de opbrengsten (en andere economisch relevante groatheden) van het toerisme niet expliciet uit de kernstructuur van de NR zijn af te leiden. Dit weer is een gevolg van het feit dat toerisme geen aparte industrie is binnen de bedrijfsindeling van de nationale rekeningen, zoals de bouwnijverheid of de horeca dat wel zijn. De achterliggende oorzaak daarvan is de geheel eigen aard van toerisme. De productie van toeristische goederen en diensten vindt plaats in veel verschillende industrieën zoals in de horeca, detailhandel en transport. De noodzakelijke statistieken moeten dus apart worden 'losgeweekt'. Te hanteren definities en concepten zijn vastgelegd in het handboek van het raamwerk van toerismerekeningen (Engelse naam "Tourism Satellite Account: Recommended Methodological Framework" (UNSD et al., 2001), afkorting TSA:RMF). Dit handboek is een gezamenlijke publicatie van een aantal internationale organisaties, namelijk de United Nations Statistical Division (UNSD), de World Tourism Organisation (UNWTO), het Statistical Office of the European Communities (Eurostat), de Organisation for Economic Co-operation and Development (OECD) en de Europese Commissie.

Er is nog een tweede aspect van belang. In feite is toerisme binnen het kader van de NR een vreemde eend in de bijt. Toerisme bevindt zich aan de vraagzijde van de economie. Pas bij de consumptie van een goed of dienst wordt duidelijk of deze consumptie behoort tot toerisme, of niet. Pas wanneer een bezoeker, een "toerist", een dienst of goed consumeert, rekenen we het toe aan toerisme. In dit verband is de definitie van wat nu precies een bezoeker is erg belangrijk. We zullen de internationaal aanvaarde definitie aanhouden zoals die binnen het stelsel van toerismerekeningen (TSA:RMF) is opgesteld: 'Tourism comprises the activities of persons traveling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes not related to the exercise of an activity renumerated from within the place visited' (TSA:RMF, p. 13). Hierbij is een bezoeker iemand die zich buiten zijn normale omgeving bevindt, en daarbuiten zijn activiteiten ontplooit. Bovendien mag het hoofddoel van het uitstapje niet een activiteit zijn die wordt betaald vanuit de plek die wordt bezocht. Het zal duidelijk zijn dat, gegeven deze uitgangspunten, een aanzienlijke mate van (internationaal) overleg nodig is (en is geweest) om tot een geheel van onderling overeenstemmende definities te komen. Een samenvatting van deze discussie is opgenomen in hoofdstuk 3.

De toeristische satellietrekening (TSR) is ontwikkeld om binnen de kaders van de nationale rekeningen aparte aandacht te geven aan de economische aspecten van toerisme. Deze rekening maakt zoveel mogelijk gebruik van de definities en concepten van de nationale rekeningen, waardoor de statistieken die afkomstig zijn uit deze rekeningen compatibel zijn met economische kernindicatoren zoals het bbp. Het aandeel van het toerisme in de totale toegevoegde waarde van

Nederland (2,8 procent in 2006) kan daardoor berekend worden. Naast de concepten en definities die gebruikt worden in de NR staan binnen de TSR de definitie van toerisme en bezoeker centraal. Het is van belang op te merken dat het hier gaat om een handboek van concepten en definities. Dit is nog geen statistische standaard, hetgeen bijvoorbeeld het Systeem van Nationale Rekeningen 1993 (SNA93) wel is.

Sommige producten zijn typisch voor het fenomeen toerisme. Daarom wordt in de TSR onderscheid gemaakt tussen karakteristieke diensten en niet-karakteristieke goederen en diensten. Karakteristieke diensten zijn 'producten die, in afwezigheid van bezoekers, in de meeste landen zouden ophouden te bestaan of voor welke het niveau van consumptie aanzienlijk zou worden gereduceerd' (TSA: RMF, p. 38). Er zijn overzichtslijsten samengesteld, waarbij het mogelijk is enige variatie per land aan te brengen. In de Nederlandse TSR, bijvoorbeeld, worden de volgende diensten onderscheiden: accommodatiediensten, maaltijd- en drankverstrekking, passagiersvervoer, reisbemiddeling en reisorganisaties, culturele diensten en sport en overige recreatie. De karakteristieke toeristische bedrijfsklassen zijn de hoofdproducenten van deze diensten. Dit zijn accommodatiebedrijven, restaurants en cafés, vervoersbedrijven, reisbureaus, culturele instellingen, recreatiebedrijven en dergelijke. Alle andere producten zijn niet-karakteristieke goederen en diensten en die worden geproduceerd door de andere bedrijfsklassen.

De huidige TSR bestaat uit tien tabellen. Deze zijn, als gezegd, de resultante van overleg tussen een aantal nationale en internationale organisaties. Hieronder volgt een overzicht van de tabellen, inclusief een korte karakteristiek.

– Tabel 1 betreft de toeristische consumptie in verband met inkomend toerisme (de toeristische consumptie in geld), zowel voor dagjesmensen als overnachtende toeristen. Inkomende bezoekers zijn mensen die niet woonachtig zijn in het referentieland.
– Tabel 2 betreft de toeristische consumptie in verband met binnenlands toerisme, zowel voor de dagjesmensen als voor overnachtende toeristen. Het binnenlandstoerisme omvat reizen van ingezetenen binnen het referentieland en het deel van uitgaande reizen dat aan het begin en aan het eind van de reis in het referentieland plaatsvindt. Deze twee soorten bezoekers en hun consumptieve bestedingen moeten afzonderlijk worden vermeld.
– Tabel 3 betreft de toeristische consumptie in verband met uitgaand toerisme (in geld). Uitgaand toerisme ('outbound tourism') is het toerisme van ingezetene bezoekers buiten het economische territorium van het referentieland.
– Tabel 4 is een samenvoeging van de gegevens in de tabellen 1 en 2 tot het aggregaat "interne toeristische consumptie in geld". Deze tabel omvat dus de consumptieve bestedingen van het inkomende toerisme en van het binnenlandse toerisme. Tabel 4 is één van de kerntabellen omdat de relevante gegevens van deze tabel verder worden gebruikt in tabel 6.

- In tabel 5 wordt de productierekening van de voor het toerisme kenmerkende, de aan het toerisme verwante, en de niet-specifieke bedrijfstakken van het referentieland weergegeven in een structuur die overeenkomt met de producten-structuur van tabel 4.
- Tabel 6 vormt de eigenlijke kern van het TSR-raamwerk, waar het aanbod en het verbruik van interne toeristische consumptie met elkaar worden geconfronteerd. Op basis hiervan kunnen de toegevoegde waarde van het toerisme en het toeristische bruto binnenlands product worden berekend.
- Tabel 7 betreft de werkgelegenheid in toerisme. Een aantal aspecten hiervan worden belicht zoals het aantal banen, het aantal bedrijven en de gewerkte uren.
- Tabel 8 betreft toeristische investeringen door toeristische industrieën en andere industrieën. De investeringen in toeristische infrastructuur, zoals hotels en cruiseterminals, geven ondermeer een indicatie voor de toekomstige capaciteit voor het toerisme.
- Tabel 9 betreft toeristische collectieve consumptie. Per definitie produceert alleen de overheid collectieve producten. Dit zijn diensten die aan een aantal voorwaarden voldoen; het gebruik is passief (er hoeft niet expliciet sprake te zijn van een contract), en niemand kan worden uitgesloten van het gebruik ervan.
- Tabel 10 is een verzameling van niet-monetaire gegevens over toerisme. Het betreft statistieken zoals het aantal binnengekomen bezoekers, het aantal overnachtingen, de bezettingsgraad van hotels, het aantal kamers en de beschikbare kamers en karakteristieken van de bezoeker zoals nationaliteit, inkomenscategorie en leeftijdscategorie.

We zien dat het aanbod van producten door het bedrijfsleven en het gebruik van goederen en diensten door bezoekers centraal staat in de TSR. Lang niet alle tabellen krijgen echter evenveel aandacht. De tabellen die gaan over toeristische investeringen en toeristische collectieve consumptie (de tabellen 8 en 9), bijvoorbeeld, worden op dit moment nog weinig samengesteld door participerende landen. Dit heeft tot gevolg dat nog weinig ervaring voorhanden is met betrekking tot opzet en samenstelling van deze tabellen. De World Tourism Organization (UNWTO) erkent dat er nog veel werk gedaan moet worden om de samenstelling van deze en andere tabellen te stroomlijnen.

Dit is met name het punt waar deze studie op inhaakt. De kern ervan is een visie op de TSR gebaseerd op een volledige set van tien tabellen voor Nederland, een industrieel zeer ontwikkeld, Westers land, en voor Aruba, een eilandstaat in het Caribisch gebied die nog volop in ontwikkeling is. Beide landen liggen aan verschillende einden van wat men het toeristische spectrum zou kunnen noemen. Voor Nederland, bijvoorbeeld, heeft toerisme een omvang net iets groter dan die van landbouw, terwijl het voor Aruba zeer veel belangrijker is. Verder is de

Nederlandse economie veel gevarieerder, hetgeen betekent dat er minder afhankelijkheid is van één bepaalde activiteit zoals toerisme.

Nederland speelt op het terrein van de ontwikkeling en publicatie van statistieken gerelateerd aan de toeristische satellietrekeningen een voortrekkersrol. Het Centraal Bureau voor de Statistiek heeft recentelijk de tien TSR tabellen van Nederland ontwikkeld, in een speciale afdeling waarvan ik deel heb uitgemaakt. Binnen dit project zijn de tabellen toeristische investeringen en toeristische collectieve consumptie (tabellen 8 en 9) grotendeels door mij ontwikkeld. Daarnaast heb ik de TSR voor Aruba samengesteld op het Centraal Bureau voor de Statistiek van Aruba in het kader van mijn werkverband aldaar. De tabellen voor Nederland zijn te vinden in hoofdstuk 4, 5 en 6, die voor Aruba in hoofdstuk 4 en 7. De meeste tabellen kunnen ook worden gevonden in de betreffende CBS- of andere publicaties.

Mijn conclusies zijn de volgende. De tabellen over toeristische consumptie, productie, werkgelegenheid en niet-monetaire indicatoren (tabellen 1–7 en 10) zijn onontbeerlijk voor elk land dat beleid wil gaan ontwikkelen op het gebied van toerisme. Er kan echter enige prioritering worden aangebracht in afstemming met de karakteristieken van het land in kwestie. Ten aanzien van de tabellen over toeristische investeringen en toeristische collectieve consumptie (tabellen 8 en 9) zijn mijn bevindingen de volgende.

Bij het samenstellen van de tabel over toeristische investeringen (tabel 8) stuiten we op een fundamenteel statistisch probleem. De investeringen in hotels en een cruiseterminal leveren veelal weinig problemen op in de zin dat ze voornamelijk voor toeristische doeleinden worden gebruikt. Voor investeringen in een vliegveld, dat ook voor het vervoer van goederen wordt gebruikt, of een autoweg die naast dagjesmensen ook door forensen wordt gebruikt, is dat echter minder duidelijk. Momenteel wordt daarom tabel 8 alleen op experimentele basis samengesteld tot meer ervaring in het opstellen van deze tabel is opgedaan en de methodologische vragen zijn beantwoord (zie hoofdstuk 5).

Het samenstellen van de tabel over toeristische collectieve consumptie (tabel 9) geeft andere problemen. Enkele voorbeelden van collectieve producten zijn straat-verlichting, dijkbescherming en "veiligheid". Binnen het systeem van nationale rekeningen worden collectieve producten geregistreerd als overheidsproductie en -consumptie. Achtergrond hier is het feit dat het gebruik van deze producten niet of nauwelijks aan individuele personen, bedrijven of organisaties is toe te schrijven, waardoor is besloten om alles te classificeren als overheidsconsumptie. Binnen de TSR echter worden dergelijke collectieve producten wel toegerekend aan toerismecategorieën. Het is moeilijk een punt aan te geven waar collectieve consumptie met betrekking tot toerisme eindigt, en waar de collectieve consumptie

met betrekking tot het andere deel van de economie begint. Bijvoorbeeld, "veiligheid" is onontbeerlijk voor toerisme. Bepaalde risicolanden, zoals Irak en Afghanistan, worden op dit moment niet of nauwelijks bezocht door toeristen. Ook de rest van de economie vaart echter wel bij een veilige samenleving. Omdat niet duidelijk is wie precies collectieve producten consumeert en hoeveel, is de toerekening aan het toerisme nog een vraagstuk. Naast de vele vraagstukken rond de samenstelling van de tabel toeristische collectieve consumptie is het, naar mijn mening, verder onduidelijk wat de uitkomst precies betekent. Collectieve productie wordt aan geen andere industrie, activiteit, of sector, toegerekend en in geen enkel ander land wordt toeristische collectieve consumptie berekend. Er is dus geen vergelijkings-materiaal om te bepalen of de uitkomst hoog of laag is. Het TSA: RMF handboek stelt het samenstellen van ook deze tabel uit tot een oplossing is gevonden voor de bestaande methodologische vraagstukken. Hiervan is het bepalen van welk gedeelte aan toerisme toegerekend kan worden de belangrijkste (zie hoofdstuk 6).

De tabel met non-monetaire gegevens (tabel 10) bevat de 'klassieke statistieken' die voor de introductie van de TSR voornamelijk gebruikt werden voor beleid. Non-monetaire gegevens kunnen een waardevolle bron zijn voor het opstellen van de tabellen over toeristische productie en consumptie. Een groot bezwaar is echter dat niet-monetaire gegevens niet aan elkaar gerelateerd kunnen worden zoals monetaire gegevens dat wel kunnen.

Ik ben een voorstander van een flexibele toepassing van de verschillende tabellen van de TSR (afgezien van de tabellen 8 en 9 die naar mijn mening beslist een lagere prioriteit verdienen). In een land met een relatief klein aandeel in toerisme en waar het voeren van specifiek beleid op het gebied van toerisme een lage prioriteit heeft, kan worden volstaan met de toepassing van een beperkt deel van de tabellen. Landen met een relatief groot belang in toerisme hebben uitgebreide statistieken nodig om hun beleid vorm te geven. Budgettaire mogelijkheden en de beschikbaarheid van relevante databronnen bepalen dan welke statistieken gemaakt kunnen worden.

Een volgende vraag is of de bovenstaande 10 tabellen een goed inzicht geven in de betekenis van toerisme. Mijns inziens is dat slechts in zekere mate het geval. De tabellen die de toeristische productie en consumptie binnen het referentieland bijeenbrengen, zijn, vanzelfsprekend, zeer waardevol om een goed inzicht te krijgen in de omvang van het toerisme en de manier van toedeling ervan over de industrieën en productcategorieën. Deze informatie beantwoordt de vraag 'waar in de economie het toerisme is gelokaliseerd'. Ook de werkgelegenheid die toerisme oplevert en het potentieel aan andere mogelijkheden is zeer waardevolle informatie voor het voeren en ontwikkelen van beleid. Dit type informatie is echter niet voldoende voor een volledig, "eigentijds" beeld. In Aruba, bijvoorbeeld, bestaat de moeilijkheid vacatures te vervullen. Een uitbreiding van het aantal hotels zou betekenen dat arbeid uit andere landen moet worden betrokken om het extra

kameraanbod schoon te houden. De vraag is echter of dit type informatie voldoende is voor het voeren van goed beleid. In het geval van Aruba bijvoorbeeld is het van belang te weten welk deel van de opbrengsten van het toerisme naar het buitenland gaat. Meer informatie over de consequenties van toerisme voor de economie is derhalve nodig. Bijvoorbeeld, de consequenties van het te voeren beleid op de overheidsfinanciën (opbrengsten en kosten van het toerisme voor de overheid) en de portemonnee van de huishoudens zijn belangrijk.

Eén en ander houdt voor landen zoals Aruba in dat het noodzakelijk is om een beeld te krijgen over de rol van toerisme over de hele linie van de economie. Niet alleen de toeristische productie en consumptie zijn van belang, maar ook bijvoorbeeld de invloed van toerisme op rente- en dividendbetalingen aan het buitenland. Landen van dit type zouden daarom de tien tabellen moeten uitbreiden met een tabel gebaseerd op de institutionele sectorrekeningen. In deze rekeningen zou de interactie tussen economische sectoren zoals niet-financiële bedrijven, financiële bedrijven, overheid en huishoudens zichtbaar moeten zijn voor een uitgebreid aantal transacties. Dit is een aspect dat ontbreekt in de huidige TSR.

Voor de toepassing van een dergelijke tabel (gebaseerd op de institutionele sectorrekeningen) op toerisme moet van toerisme een sector worden gemaakt (in tegenstelling tot een industrie c.q. activiteit). Toerisme verandert dan in een economische sector genaamd 'sector toerisme'. Deze sector voert transacties uit met andere economische sectoren zoals de overheid en met de rest van de wereld. Uit de interacties met het buitenland kan dan een beeld worden verkregen over uitgaande geldstromen. De 'toerisme sector' beslaat bedrijven die actief zijn in de productie van toeristische goederen en diensten. De toepassing van de institutionele sectorrekeningen betekent een uitbreiding van het aantal transacties in vergelijking met de set van tien tabellen. Het effect dat toerisme heeft op andere sectoren, zoals de overheid, en op het buitenland wordt binnen een institutionele benadering van toerisme zichtbaar gemaakt.

Als deel van dit onderzoek heb ik in hoofdstuk 7 voor Aruba een op de institutionele sectorrekeningen geïnspireerde tabel voor uitgaand toerisme samengesteld voor het jaar 1999. In deze tabel is te zien dat niet alleen via importen het geld Aruba verlaat, maar ook via rente- en dividendbetalingen. Voor veel investeringen in hotels en restaurants op Aruba is buitenlands geld gebruikt, met als gevolg hoge rente- en dividendbetalingen naar het buitenland. Toerisme in Aruba is omvangrijk met ongeveer 18 procent (zie hoofdstuk 4) van het bruto binnenlandsproduct afkomstig uit binnenkomend toerisme. Verder heb ik in hoofdstuk 7 aangegeven dat de uitbreiding met één of meer tabellen rond de ecologische duurzaamheid-problematiek zeer nuttig kan zijn. Een goede basis hiervoor kan gevonden worden in een integratie met statistieken gebaseerd op het zogeheten SEEA, het System of Integrated Environmental and Economic Accounts.

De statistieken opgebouwd in de verschillende aanbevolen TSA: RMF tabellen of in de door mij voorgestelde extensie in de institutionele sectorrekeningen kunnen worden gebruikt in modelmatige toepassingen. Hierbij moeten keuzen gemaakt worden tussen verschillende soorten modellen zoals econometrische modellen en input-output modellen. Ik heb gekozen voor de laatste soort, input-output tabellen, omdat deze dicht bij de nationale rekeningen staan en op een relatief eenvoudige wijze inzicht geven in vele indirecte effecten. Daartoe heb ik een symmetrische input-output tabel van het industrie bij industrie type opgesteld voor Aruba. Deze tabel is ontwikkeld aan de hand van de kaders uit de aanbod- en gebruiktabel van 1999, basis data en aanwezige specialistische kennis. Voor verdelingen over categorieën zijn ondermeer verkoopratio's gebruikt. Uit de tabel heb ik vervolgens multipliers berekend waarmee ik het indirecte effect van toerisme in Aruba heb berekend (dit is 30 procent). Met de multipliers kunnen ook scenario's en plannen worden doorgerekend. Dit is echter een onderdeel voor verder onderzoek. Hoofdstuk 8 bevat de delen over de relatie tussen NR, de aanbod- en gebruiktabel en de empirie betreffende Aruba. Hoofdstuk 9, tenslotte, bevat conclusies en aanbevelingen.

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