# Documentation on Regional Tourism Satellite Accounts in Denmark

by

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# Preface

Making regional tourism satellite accounts for Denmark is part of the tourism project that akf has made for VisitDenmark. The project is financed by VisitDenmark.

The aim of tourism satellite accounts is to make tourism statistics that are consistent with national accounts. Another objective of the project is to use the tourism statistics, together with the Danish interregional model, to make regional tourism economic analysis.

Robin Rich from VisitDenmark has given advice concerning the Danish tourism data during the whole working period. Pernille Bang and Thomas Thessen from Statistics Denmark have made suggestions concerning the Danish national accounts and other tourism information. I would like to express my sincere thanks to them.

Three referees, Ellen Andersen, Christian Hansen and Jesper Munksgaard have also made valuable suggestions in the final version of the report. I would like to express my gratitude to them.

This project is the first Danish regional tourism satellite accounts ever being made. Some of the tourism data need to be expanded and some methodologies for developing better tourism statistics need to be improved. I would like to state that all the remaining errors in the document and methodologies are my sole responsibility.

Jie Zhang
March 2005

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# List of Abbreviations

| | |
|---|---|
| AIDA | interregional model for counties in Denmark (akf's interregional model) |
| akf | Institute of Local Government Studies – Denmark |
| CPA | classifications of products by activities |
| CO | public consumption (variable name in the model) |
| CP | private consumption (variable name in the model) |
| CPI | Danish same-day tourism consumption (variable name in the model) |
| CPU | foreign same-day tourism consumption (variable name in the model) |
| CTI | Danish overnight leisure tourism consumption (variable name in the model) |
| CTU | foreign overnight tourism consumption (variable name in the model) |
| DB93 | Danish branch code from 1993, Statistics Denmark |
| EIM | European Implementation Manual on Tourism Satellite Accounts |
| EU | foreign export (variable name in the model) |
| Eurostat | Statistical Office of the European Communities |
| GDP | gross domestic product |
| IR | gross fixed capital formation (variable name in the model) |
| LINE | interregional model for municipalities in Denmark (akf's interregional model) |
| NACE | nomenclature of activity of European Communities |

| | |
|---|---|
| NRNR | commodity register system in the national accounts, Statistics Denmark |
| OECD | Organization for Economic Cooperation and Development |
| RMF | Tourism Satellite Account: Recommended Methodological Framework |
| RTSA | regional tourism satellite account |
| SAM | social accounting matrix |
| SIC | Standard Industrial Classification |
| SNA93 | the System of National Accounts, 1993 |
| TA | National make and use table, Statistics Denmark |
| TSA | tourism satellite account |
| TSP | tourism-specific products |
| TØBBE | Turismens Økonomiske og Beskæftigelsesmæssige Betydning (in Danish)<br>(Economic and employment significance of tourism in English) |
| UN | the United Nations |
| VAT | value-added taxes |
| WTO | World Tourism Organisation |

# Summary

This is documentation on Regional Tourism Satellite Accounts (RTSA) in Denmark. The RTSA project is part of the tourism project between akf, Institute of Local Government Studies and VisitDenmark, the Denmark national tourism organisation. Since 1996 the co-operation between akf and VisitDenmark started, the target of the tourism project has been to collect the tourism demand data by the survey method and to make regional tourism economic analysis with an interregional macroeconomic model. It has been decided by both partners to further develop the tourism accounting method in order to compile tourism statistics in accordance with the international standard. A tourism satellite account (TSA) is an international standard method for making the tourism statistics. TSA has been recommended to all the member countries by the OECD statistical commission, the Eurostat, the World Tourism Organisation (WTO) and the United Nations (UN) Statistics Division.

The purpose of making the regional TSA is to prepare regional TSA tables and to measure the tourism contribution to the regional economies. The compiling of the TSA tables should be consistent with the national accounts; it should be comparable with the TSA tables from other countries and comparable with the other industries within the economy. The task for TSA is to provide credible, consistent, reliable and comparable tourism statistics and an analytical tool for tourism regional studies.

The documentation contains six sections. Section 1 is an introduction; the objectives and the guidelines for TSA are given in section 2. Section 3 addresses the definitions of tourism-related terms. The detailed definitions of tourist and tourism, tourism demand, tourism products and tourism in-

dustry are given in the TSA official documents. In this section a brief summary of the definitions is given, in order to make clear the meaning of the terms of tourism, tourism demand and tourism industries that we apply in the Danish TSA. It is important to define there terms, as they do not exist in the traditional economics terms and in the national accounts. A list of tourism products and tourism industries that are defined in the Danish TSA context are given in the appendix of the report. Section 4 describes the data requirement for the regional model, and the TSA tables required by the Eurostat, the OECD, the WTO and the UN. The methodologies adopted for developing the Danish regional TSA are presented in section 5. A more general procedure for making the regional TSA is described in section 5.2; the detailed estimation methods are presented in section 5.3. Section 6 presents and explains the results of the TSA tables. The six TSA tables are presented in this section. Some supplementary information and recommendations are given in the last section.

The main part of this report is the methodological documentation for developing the Danish RTSA. It documents the data sources and the methods for compiling the TSA statistics. The TSA statistics consist of two main parts: the tourism supply and the tourism demand. The tourism supply shows the tourism products produced by the tourism-related industries. It is required to measure the tourism supply at both basic prices and at market prices. Some methodologies are needed to estimate the tourism supply at market prices.

The tourism demand estimations are more complicated than the tourism supply. The main data sources for estimating the tourism demand are the tourism survey data. The Danish tourism survey data are not directly compatible with the TSA table requirements; they are not consistent with the data in the national accounts either. Therefore, some methods are needed in order to estimate the tourism demand more precisely. Firstly, the consumption components in the tourism survey data have to be transformed into the consumption components in the model, which are the same components as in the national accounts. Secondly, the components have to be transformed into the product categories that are in accordance with the international standard for the TSA products. Thirdly, a new method is adopted in the Danish TSA development, that is, we combine the tourism

survey data and the tourism supply data to estimate the tourism demand by the TSA products. This is due to the lack of some product categories in the tourism survey data, which lack some information needed for compiling the TSA tables. Therefore, the tourism demand estimation is based upon the three sources: tourism survey information, the national use tables and the national supply tables.

To conclude the Danish regional TSA project we find that the advantages for this work are:

a) It is made in accordance with the official documents and recommendations.
b) It merges the TSA accounting part with the modelling part, and both of them are built based on the national accounts. The Danish TSA is consistent with the Danish national accounts.
c) It has time series and it has possibility for forecasting the TSA tables to the present year.
d) It is regionalised TSA, therefore it is easier to be applied for the tourism regional economic analysis.

Several aspects in the TSA work have to be improved in the future work. Apart from what has been mentioned in the last section concerning Danish same-day visitors, outbound tourism and domestic business tourism, there is still room for TSA improvement. For instance, the private consumption in hotels and in some forms of transport, for example air transport, in the national accounts seems to be lower than the data from the tourism survey. Some information is still unavailable from the tourism survey, such as the tourism consumption in car rental and in use of tourism bureaus; the domestic tourists' (or visitors') use of private car for the tourism purposes. The future work still requires the co-operation among Statistics Denmark, VisitDenmark and akf.

# 1 Introduction

akf and VisitDenmark with statistical assistance from Statistics Denmark started the process of preparing tables for the Danish tourism satellite accounts (TSA) from 2003. This project follows the recommendation for TSA in the field of tourism statistics from the World Tourism Organisation (WTO), Organisation of Economic Co-operation and Development (OECD), Commission of the European Communities (Eurostat) and the United Nations (UN) Statistics Division.

It is a tendency in recent years for many countries in the world to set up works on constructing their tourism satellite accounts. The governments in the OECD countries are under increasing pressure to set up the tourism satellite accounts, because the TSA is already recommended by the OECD, WTO, Eurostat and UN. Besides, there is an increasing need for these governments to give special treatments to tourism industries, as well as to provide tourism industries and relevant businesses with information concerning tourism statistics.

The national accounts in many countries apply the System of National Accounts (SNA93) recommended by the United Nations (UN), within the framework of which many tourism-related economic activities, not being »classic economic sectors«, are not identified as SNA sectors. Therefore, it is difficult to show the tourism activities as a whole and to assess the economic importance of tourism in the national or regional economies. Indeed, tourism is really a collection of economic activities that involve transactions in a wide range of economic branches. That is why there is no simple answer to such questions as the contribution of tourism to the gross domes-

tic product (GDP) or to total employment throughout the economy, simply on the basis of the SNA (Rütter and Berwert 1999).

The tourism satellite account was first initiated in 1991 in Ottawa when representatives from 90 countries attended the conference to call for developing tourism satellite accounts. Later in a World Tourism Organisation conference in Nice, France in June 1999, representatives from 120 countries confirmed TSA as a new methodology for tourism assessment and recognised that TSA was the future for measuring the economic impact of tourism. In a more recent conference held by the WTO in May 2001 in Vancouver, 200 delegates from more than 50 countries met to review the progress of the TSA and they agreed to encourage adoption of TSA following the new UN/WTO standard in the next decade.

About 40 countries worldwide have begun the process of developing TSA, either at national level or at regional level. Canada stands out among the countries which publish TSA tables. Statistics Canada also publishes the national tourism indicators (Delisle 1999). Canada, Norway and France, among others, have already built their regional tourism satellite accounts.

Denmark has got more than ten years of experience in tourism economic impact studies. Since 1996, akf (i.e. Institute of Local Government Studies) has started co-operation with VisitDenmark, to construct a tourism pre-model, TØBBE. TØBBE which combined together with the akf's interregional models, AIDA (1996-1999) or LINE (2000- now) to assess the tourism regional impact in Denmark. The AIDA model is a macroeconomic model with built-in interregional input-output tables, which has been used by the akf researchers for different projects during 1994-1999. The LINE is an interregional macroeconomic model developed rather recently. The AIDA is the interregional model that broke up the national account into a county level, while in the LINE model, most data, such as production, employment and income, etc., are constructed based on municipal data. Therefore, the LINE model is a flexible model, which can be aggregated into a county model. The data structure for LINE is a Social Accounting Matrix (SAM) within which the make and use matrices are applied. The make matrix (supply side) shows an industry-commodity linkage and the use matrix (demand side) shows a component-commodity

linkage. Supply and demand in monetary terms are balanced at each commodity level.

After many years of experience in the tourism regional impact analysis by using the interregional model, VisitDenmark and akf have decided to start this project for developing a regional tourism satellite account (RTSA) for Denmark. The reason for starting the regional TSA, instead of the national TSA, is that tourist activities and tourism data in Denmark are already regionalised due to the tourism interviewing data based on the regional level. Besides, analysing regional tourism economic consequences in Denmark is far more important than the national tourism impact. Therefore, the regional TSA will be a new tool for analysing tourism's regional impact in Denmark.

# 2 Aims of TSA and Guideline for TSA Work

The goal of making the regional TSA is to measure the tourism contribution to the regional economies, including regional tourism GDP, tourism employment, tourism demand and supply. To serve this purpose the precise tourism statistics should be constructed under the national accounting system.

In many countries tourism statistics is mainly based on the following indicators: tourist arrivals; number of overnight stay; tourism receipt; balance of payment information about tourism payment. The World Tourism Organisation (WTO) can only publish the tourism statistics, such as tourist arrivals and tourism receipt for most countries in the world. It is impossible for WTO at present to publish the economic indicators that are related to tourism, such as tourism value-added and tourism employment. In order to have common standards so that all countries can compare their tourism indicators on the same basis, the WTO together with the other international organisations (OECD, UN Statistics division and the EU Commission, Eurostat) called for preparation of TSA tables that should be in accordance with the recommended methodological framework.

The tourism arrivals and tourism receipt statistics are two important indicators for tourism statistics; however, they are far from enough to give a full description concerning the economic phenomenon of tourism in the national and the world economy. There are general needs for accurate measurement of tourism and comparable tourism information in relation to the other economic sectors. For example, various levels of governments (such as state, regional and local governments), different types of businesses (such as hotels and other accommodation businesses, transport and

other service businesses) and citizens will like to receive the accurate information about tourism.

Various levels of governments are interested in the tourism economic information, as they are concerned about what kinds of effective policies should be made within the tourism fields. They are keen to know the economic impact of tourism and the costs and benefits of tourism investment. The local tourism-relevant businesses have an interest in knowing their operational effects, tourism markets, turnover of total tourism industry, investment returns, etc. The residents inquire about tourism's social, economic and environmental impact. For example, the residents feel overcrowded in the summer period due to many tourists in the area. They want to know the benefits and the costs of having so many tourists around. Therefore, information only concerning the tourist arrivals and overnight statistics cannot meet all the needs and inquiries. Tourism satellite accounts attempt to give a full description about tourism statistics and tourism economic indicators.

The objectives of this project are to build the regional tourism statistics which should be consistent with the national accounts, to provide greater efficiency in the programming and the processing of tourism data from different sources, and to provide an analytical tool and information for tourism authorities, policy makers, tourism business and other interest groups. The high qualified information on tourism industry and tourism demand in Denmark shall offer decision-makers a wide view of tourism; give local governments and local tourism organisations a correct assessment of tourism impact on the regional economies; and to provide tourism businesses and residents a variety of information about tourism.

In general, satellite accounts are frameworks designed to expand the analytical capacity of the »basic« economic accounts without overburdening them with details or interfering with their general-purpose orientation. Tourism satellite accounts follow the same rules, which are meant to supplement rather than to replace the existing national accounts. Actually, tourism satellite account is a way of dipping into a country's conventional industrial sectors and redefining the tourism activities. Therefore, the aim of developing a tourism satellite account is to reorganise information in an

internally consistent way that suits the tourism analytical focus, while maintaining links to the existing national accounts.

The concrete purpose for developing a regional tourism satellite account in Denmark can be concluded as to

- better identify tourism or tourism-related industries, those industries deliver tourism commodities and service to tourists;
- identify the tourism commodities and service according to the recommendation from Eurostat, OECD, UN and WTO;
- build a regional tourism satellite account based on both the national statistics (i.e. the top-down method) and the visitor survey data (i.e. the bottom-up method);
- provide information of visitors' expenditure by various dimensions, for example, by region, nationality and accommodation type in current prices;
- show the tourism impact on the regional economy, for example, gross value added, governmental tax revenue, personal income and employment;
- provide estimates of tourism consequences on tourism industries;
- offer information about tourism markets.

The guidelines for the Danish TSA work are the two important documents:

- Eurostat (2002): *European Implementation Manual on Tourism Satellite Accounts – based on the internationally approved* »*Tourism Satellite Accounts: Recommended Methodological Framework*« (hereafter we call it the EIM document).
- Eurostat/OECD/UN/WTO (2001): *Tourism Satellite Account: Recommended Methodological Framework*, Luxembourg, Madrid, New York, Paris (hereafter we call it the RMF document).

The regional TSAs have potential for and possibilities of providing detailed data on regional tourism. The task is to provide credible, consistent, reliable and comparable tourism statistics and analytical tools for regional tourism studies.

It is known that the single tourism industry does not exist in the national account system, because the tourism commodities are buried into

those transactions that involve in a wide range of economic branches. It is a challenge to construct a regional TSA based on the conventional national accounting system.

# 3 Definitions of Tourism-Related Terms

Before making any tourism statistics and tourism measurement, it is important to give a clear definition of tourism. Which areas does tourism cover? What is tourism demand? What are the definitions for tourism products and tourism industry? Different countries might have different definition about tourism. Some countries may cover wider areas of tourism than other countries do. Even within the same country, the definition of tourism can be changed during different periods. For example, tourism activities can include or exclude domestic same-day tourism. For the domestic same-day tourism the distance definition should be given in order to decide which trips are within the spectrum of tourism, or which trips are simply local shopping. In general, all the countries define the foreign tourist expenditure within one country's territory as tourist expenditure.

## 3.1 Tourism

The World Tourism Organisation defines travel & tourism 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« (Eurostat/OECD/UN/WTO, 2001).

According to the above-mentioned document, the persons referred to in the definition of tourism are termed »visitors«. 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 the trip is other than the excise of an activity remunerated from within the place visited.

We shall notice that in the TSA documents the tourism activities also include the potential visitors' purchases, such as purchases of camping equipment or travel insurance, or by visitors after they have returned home, such as having film developed of pictures taken during the trip. TSA defines activities related to vacation homes and other secondary residences as tourism activities.

Tourism is a demand-oriented definition. The demand-side definition of tourism focuses on the economic activities of visitors and argues that tourism industry does not produce or supply a homogenous product or service like traditional industries (agriculture, mining, steel, etc.). Instead, travel and tourism is a collection of products, including durable and non-durable, consumer and capital goods, and all sorts of services, such as from airline to cruise ship fares, from accommodations to restaurant meals, from museums to amusement park services, from automobiles to normal souvenirs, and so on.

The supply-side definition focuses on the commodities that industry produces. Commodities are so central to the concept of supply-side definition that a generic definition of tourism can be readily articulated such as: »tourism is the aggregation of all businesses that directly provide goods or services to facilitate business, pleasure, and leisure activities away from the home environment«.

The phrase »usual environment« is introduced to exclude from the concept of »visitor«, persons commuting every day between their home and place of work or study, or other places frequently visited. TSA documents also address the terms for duration of visitor stay, the purpose of the visit and classification of visitors. The characteristics of tourism can be further clarified as follows:

1. *Environment*: Tourism should happen outside visitors' usual environment.
2. *Duration*: A visitor's stay in a place should not last more than one consecutive year. If the duration is more than one year, this place becomes part of his/her new usual environment, and he/she ceases to be considered as visitor. There are two classes of visitors: tourists, who stay one or more nights in the place visited; and same-day visitors,

who visit a place for less than one night, or can be called »day-trippers«.

3. *Motives*: Generally speaking, tourists are individuals who travel for leisure, recreation and holidays. The RMF document gives a much broader definition with regard to the purpose of the visit. It includes a) leisure, recreation and holiday; b) visiting family, relatives and friends; c) business and professional; d) health treatment; e) religion, pilgrimages; f) others.
4. *Classification of visitors*: There are two types of visitors, international visitors and domestic visitors.

In accordance with the TSA documents and the TSA tables, the visitors/tourists are classified in this report as follows:

- Foreign same-day visitors;
- Foreign overnight tourists, including both business and leisure visitors;
- Domestic same-day visitors (data are not available yet);
- Domestic overnight leisure (or other purposes) tourists;
- Domestic business overnight visitors;
- Domestic outbound same-day visitors (data are not available yet);
- Domestic outbound overnight tourists (data are not available yet).

## 3.2 Tourism Demand

While the notion of visitors, tourists and tourism is clearly explained, it is also important to define the tourism demand. The definition of tourism demand will influence the measurement of tourism expenditure, hence, the tourism economic analysis.

Tourism demand represents »the expenditure made by, or on behalf of, the visitor before, during and after the trip and which expenditure is related to that trip and which trip is undertaken outside the usual environment of the visitors« (OECD, 2000). A direct physical relationship is normally involved at the time when visitors' expenditure took place and within the place where the expenditure was made.

In principle, the demand induced by tourism will happen before, during and after the trip. For example, a traveller buys a travelling bag, a cam-

era and a film before the trip, or he gets his photos developed in his residential local photo shop after the trip. This expenditure is made before (or after) the trip at the traveller's home place. When the tourism expenditure data are collected by a tourism destination country, the residents' expenditure before (or after) the trip made by the outbound visitors will not be included. Only the expenditure made in the tourism destination country (i.e. during the trip) is normally collected at the host country. Therefore, the total tourism demand in the world tends to be underestimated if all the countries collect the tourism data in such a way. It is suggested by the TSA documents that the tourism demand also comprises the tourism consumption by the residents' outbound trips before leaving the country of reference and after returning to the country of reference.

OECD and WTO called for a special attention to the following expenditure related to tourism:

- expenditure on international aeroplane tickets;
- expenditure on package tours;
- expenditure at tourist bureau in the home country;
- expenditure on car rental in the home country;
- expenditure on all kinds of tourist products (durable and non-durable) related to the trip made before and after the trip in the home country.

In principle, travel and tourism demand includes four parts: 1) travel and tourism consumption; 2) travel and tourism capital investment (both private and public); 3) travel and tourism government expenditure (collective consumption); 4) travel and tourism foreign trade. This is a more broad definition of tourism demand; however, in many analyses the tourism demand is defined narrowly as the same as tourism consumption.

The definition of tourism demand used in this report is a narrow one, which means that the spectrum of the tourism demand is defined in the same area as the tourism consumption, in which it includes the tourist expenditure made by both domestic and foreign »tourists« in Denmark. The governmental and collective consumption on travel and tourism is not included, and neither is the tourism capital investment. The expenditure made by the foreign tourists at their home countries or third countries is not included in the tourism demand in Denmark. On the other hand, the tour-

ism consumption made by the domestic outbound tourists before or after their trips abroad is not included for the time being. This category will be included when the data are available.

## 3.3 Tourism Products

Tourism consumption covers the total consumption made by visitors and tourists, both domestic and foreign visitors and tourists. It should be further divided by domestic tourism consumption and foreign tourism consumption, or further divided into foreign same-day visitor consumption and foreign overnight tourism consumption, etc.

For the purpose of international comparison of the tourism statistics between countries, it is required to present the tourism consumption by category of products. Products are defined here as both commodities and services. According to the RMF document, all the goods and services in the national accounts can be divided into two categories: (1) tourism-specific products; (2) non-specific tourism products. The first category, tourism-specific products, can be further divided into (a) tourism-characteristic products; (b) tourism-connected products.

*Tourism-characteristic products*: 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 (Eurostat/OECD/UN/WTO, 2001, p. 38). One important feature of tourism characteristic activities is that they must serve the visitors themselves, in other words, there must be a *direct contact* between the provider of the product and the consumer. For example, hotel service is a typical tourism-characteristic product. Museums and theme parks are also tourism-characteristic products.

*Tourism-connected products*: A residual category, including those that have been identified as tourism-specific in a given country, but for which this attribute has not been acknowledged on a worldwide basis (Eurostat/OECD/UN/WTO, 2001, p. 39). The tourism-connected products are

defined here in order to have room for some countries that have special tourism products, but have not been listed in the recommendation.

*Tourism-specific products*: The sum of the two previous categories. The main objective of the list of tourism-specific products is to make international comparability possible in the economic analysis of tourism.

*Non-specific tourism products*: All those commodities and services which are considered of no major direct tourism interest, but are consumed by tourists. For example, tourists may also buy food and drinks in the supermarkets, or they buy clothes, footwear or cameras in the tourism destination countries. These products are normal consumer products, which are defined as non-specific tourism products.

A note is given here about the definition of a product and a commodity. As mentioned above that products include both commodities and services, however, in the context of this report, we use interchangeable terms for products and commodities. This means that when the term of commodity is used, it also includes the service.

A list of tourism-specific products and non-specific tourism products is given in the appendix.

## 3.4 Tourism Industry

Industries are normally understood as »groups of establishments engaged in the same kind of productive activities«. According to the TSA documents, a tourism industry is defined as »a group of establishments whose principal productive activity is a tourism characteristic activity« (ref. Eurostat/OECD/UN/WTO, p. 46).

It is observed that a single tourism industry does not exist according to the Standard Industrial Classification (SIC) code. This is because SIC categorises an industry according to the goods or service it produced. To be precise, it is suggested to use the »tourism-related industry« as the notion. However, the »tourism industry« mentioned here indicates the same concept as the tourism-related industry. The degree of tourism characteristic

activity is different in the different tourism industries according to their relevance to tourism. Generally speaking, accommodation and catering industries are highly related to tourism-characteristic activities. Recreational, cultural and travel services are also highly related to tourism activity, even though they also serve the local residents. Transport services have quite different degrees of relevance to tourism.

As shown in table A1.2 in the appendix, the tourism industries are including those industries that have more or less extended connections with tourism. Ten of the industries are listed as tourism industries; however, most of them provide services to local residents as well. Transport industries should, by all means, be transport industries by definition. As transport industries are also important industries for tourism, they are also defined as tourism-related industries by the TSA.

For the purpose of the detailed classification for both tourism products and tourist industries, it is suggested to acquire as detailed information of tourist expenditure as possible in the tourism data collection. For example, in the tourist interview questionnaire, it is better to let tourists break down their total expenditure into several categories that are in accordance with the TSA products.

For example, according to the TSA documents, the following tourist expenditure categories are most important:

- Accommodation – hotel, camping, holiday centre, second home or summer cottage, etc;
- Catering – restaurant, night club or food and drink from supermarket;
- Long-distance transport – airplane, train, ferry or own car;
- (In case of using their own cars, how much they spend on petrol and car repair services);
- Local transport – subway train, bus, taxi, touring coach and car rental;
- Travel service – tourist bureau, tour operator, tourist guide, package tour;
- Entertainment – amusement parks, museums, zoo, botanical garden, sports events, others;
- Other services – financial service, insurance, post, telephone communication, private service;

- Shopping – clothes, footwear, electronic equipments, data processing equipments, gold/silver/watches, souvenirs, etc.

# 4 Data Inputs for the Model and the TSA Tables as Output

This section describes the data requirement for the interregional model with the regional TSA (LINE/RTSA). The regional TSA tables will be the output from this special version of the model. These tables are in accordance with the TSA tables recommended by the Eurostat, OECD, WTO and the UN statistical division.

## 4.1 Data Requirement for the LINE/RTSA Model

Several sources from Statistics Denmark are used in constructing LINE/ RTSA.

### Production Data at Regional Level

The national accounting data at regional level from Statistics Denmark are one of the main sources to build the regional model and the regional TSA. It includes the variables, such as production output, intermediate consumption, gross domestic products at factor costs, and other production tax less subsidies on production, compensation to employees, gross operating surplus and number of employees. The variables contain several dimensions:

(a) Region at municipal level (there are 276 municipalities in Denmark)
(b) Sector at detailed level of 132 classified industries
(c) Yearly data cover 1993-2002 (updated every year)
(d) Price in fixed and current prices.

### Make-use Data at National Level

Make-use tables from Statistics Denmark are national account data at national level. They are actually supply and use tables. The data cover both industrial supply and final demand with very detailed information about commodities and service. They include variables, such as production, intermediate consumption, private consumption, public consumption, investment, stocks, imports and exports. These variables have the following dimensions:

(a) Sector at detailed level of 132 classified industries
(b) Commodity dimension covers about 2800 commodities
(c) Yearly data cover 1988-2000 (updated every year)
(d) Price in fixed and current prices.

### Tourism Data

The TØBBE data are a tourism survey database, which is collected by VisitDenmark. The data are including both number of tourist nights and tourist daily consumption. The data have the following dimensions:

(a) Overnight counties: The data for the number of tourist nights are based on county level (14 counties and two independent municipalities).
(b) Form of accommodation: 16 different accommodation forms are included in the database.
(c) Nationalities: 21 different foreign nationalities are included in the database. Instead of the nationalities for the Danish tourists, we distinguish them by place of residence by county. For the Danish business travel, we distinguish them by place of firms' location by county.
(d) Consumption components: Daily consumption data have 13 consumption groups.
(e) Time series: Tourism survey started in 1996 and it has been carried on until now.

### Regional Census Data

The regional census data that include population, employment, primary income, and taxes, etc. are also from Statistics Denmark. The variables have two or more of the following dimensions.

(a) Place of production (by 276 municipalities)
(b) Place of residence (by 276 municipalities)
(c) Sector (by 132 industries)
(d) Education (by 5 groups)
(e) Age (by 7 groups)
(f) Sex (by 2 groups)
(g) Households (by 4 groups).

### Detailed Industry Data at Regional Level

This databank from Statistics Denmark mainly includes two kinds of variables, i.e. primary income and employment. This has two dimensions as follows:

(a) Region at place of production (by 276 municipalities)
(b) Sector and branches at detailed level (by 820 detailed branches).

## 4.2 Recommended TSA Tables

According to RMF and EIM documents, the TSA tables should, at least, include 6 tables at present. Tables 7-10 can be included when the data are available. A brief description of the tables and availability in the Danish TSA is given in the following:

*Table 1*: Inbound tourism consumption, by products and categories of visitors (i.e. same-day visitor and overnight visitors): This is equal to our database for foreign tourism in Denmark: Available, but the product categories should be constructed by RTSA framework.

*Table 2:* Domestic tourism consumption, by products and ad hoc sets of resident visitors (for example, resident visitors within their own region, resident visitors to other regions and business visitors): The tourism consumption for the Danish overnight tourism and Danish business visitors is available, but the product categories should be constructed by RTSA framework.

*Table 3:* Outbound tourism consumption, by products and categories of visitors: Unavailable at present.

*Table 4:* Internal tourism consumption, by products and types of tourism: This is the output from table 1 and table 2.

*Table 5:* Production accounts of tourism industries and other industries, by industry and products: Available.

*Table 6:* Domestic supply and internal tourism consumption, by products: this table is a compilation from table 4 and 5.

The following tables are not required at present:

*Table 7:* Employment in the tourism industry.

*Table 8:* Tourism gross fixed capital formation of tourism industry and other industries.

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

*Table 10:* Other non-monetary indicators, for example, number of trips and overnight stays by type of tourism and category of visitor, inbound tourism: Number of arrivals by means of transport, number of establishments and capacity by forms of accommodation.

According to the TSA documents, it is not required to compile all of the 10 tables as the first step, because it will face the problems to collect the data. Therefore, it is recommended that we compile the first 6 tables as the first step then table 7 and 10 can be made as the second step.

# 5 Methodology Used in Constructing the Danish Regional TSA

The task of making the regional TSA is to expand the analytical capacity of the »basic« economic accounts without overburdening them. Another task is to supplement the existing national accounts at regional dimension with tourism survey information and redefine (or classify) the tourism activities.

The regional TSA should be able to give information on the tourism activities by the designed TSA tables. However, the main purpose of constructing the regional TSA is not only for making the TSA tables, but it should be able to make tourism statistics that is consistent with the national accounts, it should be produced on a regular basis and it should be used in the regional economic model to measure the economic consequences of tourism activities more accurately.

## 5.1 The Principle for RTSA

The principle for making the regional TSA is addressed as follows:

**1. Industrial sectors should be consistent with the national account**
The selection of TSA industrial sectors should be based on recognised national economic sector accounts. In the case of the Danish national accounts, the industrial sector is classified into 132 standard sectors. However, they are built up from about 800 detailed industrial branches.

**2. Tourism industries should be comparable with other industries**
Once the tourism industries are identified, one should be able to compare them with other conventional industries. For example, one should be able to compare labour productivity between a tourism industry and agricultural industry.

**3. Regional data should be balanced between the supply and demand at commodity level**
The RTSA will be based on both regional production account and national make and use tables. The national make and use tables are transformed to regional make and use tables by using the regional production accounts or the regional disposable income as the distribution keys. The principle of making the RTSA is to make a tourism supply and demand balance at the commodity level. This is called the »top-down method«, as it is based on the national statistical data. As the RTSA is a special account and a large amount of tourism information does not exist in the national accounts, the tourism survey data are therefore used to supplement the national accounts data. This is called the »bottom-up method«. The tourism demand estimation should also be consistent with the national accounts.

## 5.2 The Methodology

The methodological procedure of making the RTSA is shown in Figure 5.1. We apply the data inputs described in section 4 and carry out the following steps:

Figure 5.1 Methodological procedure of making RTSA

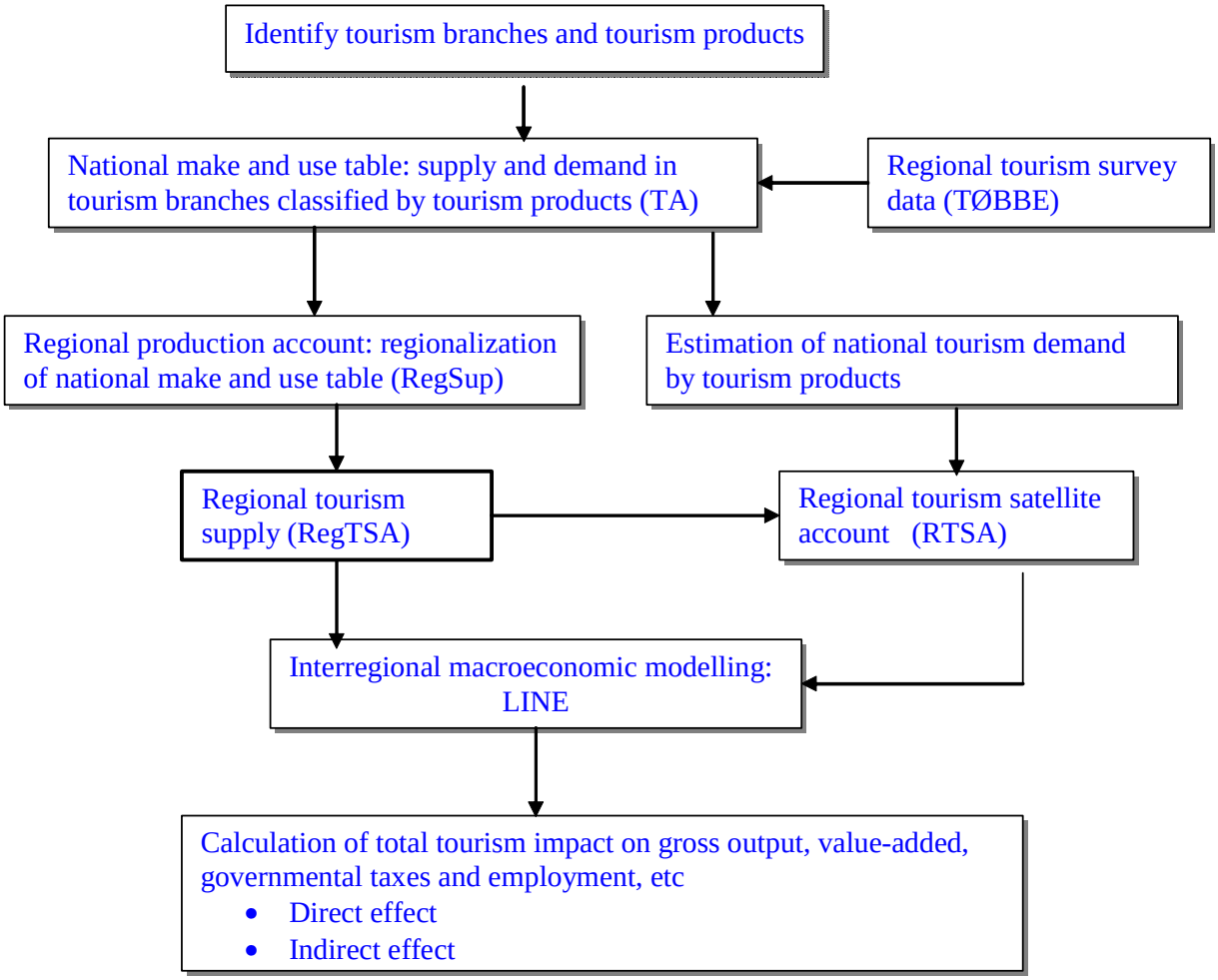



Figure1. Methodological procedure of making RTSA

**1. Identifying the tourism-specific products (TSP)**

A set of commodities and services within the national make-use tables is identified as tourism-specific products. The national make-use tables have as many as about 2,800 commodities and services, within which it is possible to identify the tourism-specific products according to the TSA documents. Table A.1.1 in the appendix shows the tourism-specific products with their codes by the Classification of Products by Activity (CPA) and by the commodity code from the national make-use tables (NRNR).

**2. Identifying the tourism branches**

We obtain regional income and employment data by detailed industrial branches (about 800 branches) from Statistics Denmark. Within these detailed industrial branches we identify about 30 branches as tourism-related industries (ref. table A.1.2 in the appendix). Some branches do not exist in the 132 standard industrial sectors aggregated by Statistics Denmark, therefore, the detailed industrial income and employment information serves as a key to distribute the standard industries into more detailed TSA industries. The tourism supply shares within each standard industry are obtained. The selection of detailed tourism industries is the same as the classification of TSP products.

**3. Making a balance between supply and demand by the TSP products**

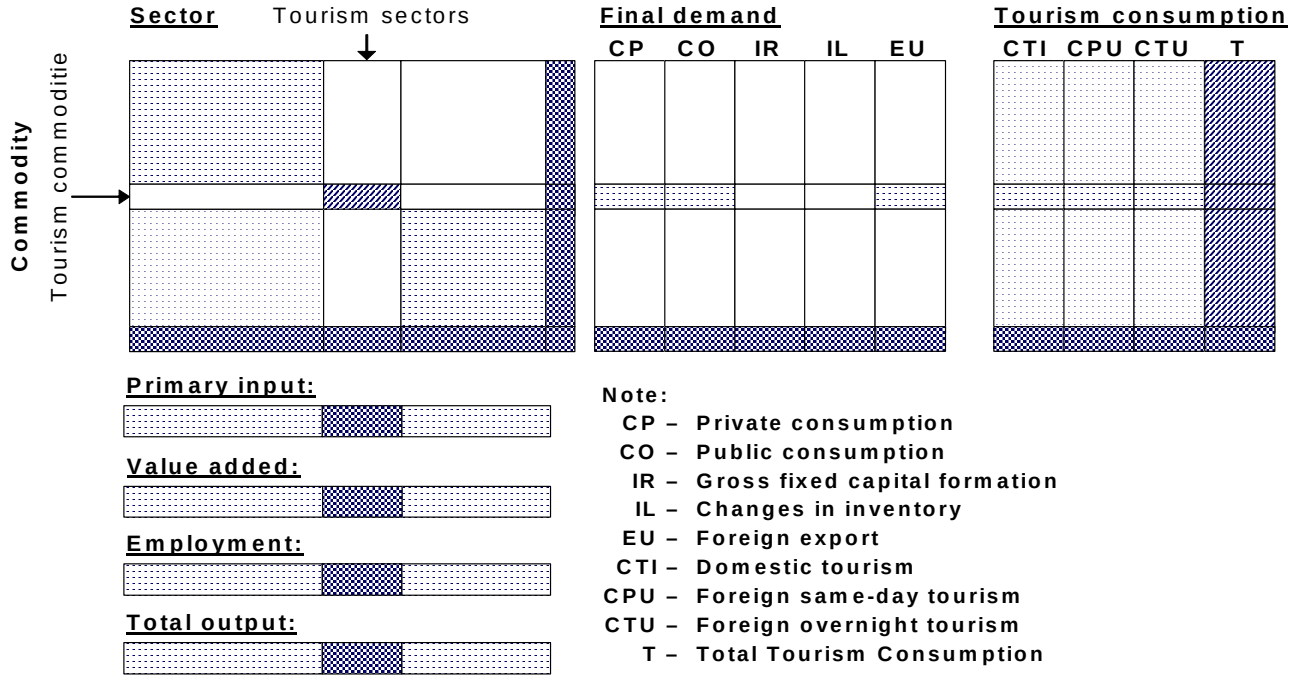
In the national accounts, make and use tables are balanced at each commodity level. This means that the total supply equals the total demand by each commodity. It should be the same for the tourism-specific products. Figure 5.2 shows the tourism commodity balance in the national supply and use tables and it also shows tourism consumption as a part of private consumption.

The top-left square is the national make table. For example, tourism sectors are shown as columns which are corresponding with the tourism commodities and services these sectors provide. The top-middle square is the national use tables which are represented by final demand. The tourism commodities and services are delivered to private consumption (CP), public consumption (CO) and export (EU). The top-right square shows the total tourism consumption (T), represented by these components: domestic tourism (CTI), foreign same-day tourism (CPU) and foreign overnight tourism (CTU).

The total tourism consumption is a part of private consumption. In regional macro economic modelling we assume that local private consumption is a residual equal to total private consumption minus total tourism consumption. Therefore, tourism commodities will get a balance between the supply and demand.

The low-left squares show the primary input, value added, employment and the total output by sector.

Figure 5.2 Tourism commodity balance in regional supply and demand




## 4. Input of the tourism survey data and aggregation to the national tourism consumption

The TØBBE data from VisitDenmark are the survey data at regional level. The tourism survey data are important information for making the regional TSA, as the national use tables provide only private consumption as the national total. It has no information about regional private consumption. Besides, it cannot separate local private consumption from tourism consumption. The aggregated tourism demand by consumption groups is compared with both the tourism supply and demand from the national accounts.

## 5. Estimation of the total tourism demand at national level by the TSP products

From the above procedures it is shown that two data sources are merged and compared for tourism products. The one source is the national use table, showing the tourism products consumed by private consumption; the other source is the TØBBE data, showing the tourism consumption for each tourism product. In case of data incompatible with each other, we have to decide which data should be applied in the estimation. The meth-

ods for estimating the total tourism demand, and data construction concerning the tourism supply and demand is presented in the next section.

**6. Regionalisation of national make-use tables**

Regionalisation of the national make-use tables is carried out by the regional production accounts. The Danish regional production accounts including information of regional production value, regional intermediate consumption, gross domestic product at factor costs, and production taxes less subsidies on production, compensation to employees, gross operating surplus and number of employment. With the help of the regional production account, national make-use tables are disaggregated into regional make-use tables.

**7. Making a regional tourism satellite account (TSA)**

With the help of the detailed regional industrial data and the regional tourism survey data, the national TSA is distributed into the regional TSA. It should ensure that supply and demand at the regional level are balanced at all commodity levels.

**8. All the regional data enter into the interregional macroeconomic model, LINE**

Concerning the description of the LINE model, the following documents are used as references; see Madsen, et al. (2001a), Madsen, et al. (2001b) and Zhang (2001).

**9. The LINE model is applied to calculate the tourism consequences in the regional economies**

By setting the tourism revenue in all the regions to zero and running the model, the model will give us the economic consequences of tourism, such as the changes in output, GDP, employment, government revenues, import and export, etc.

## 5.3 Estimation of Tourism Supply and Demand

This section is the central part of the report. It documents the methods applied in constructing the regional TSA for Denmark. The methodologies are presented in the following sub-sections: section 5.3.1 gives an introduction to the detailed tourism sectors with their corresponding aggregated standard sectors. It also introduces a concept of »supply share«, and further presents the data and the method for calculating the regional supply shares. Section 5.3.2 describes the procedure for estimating the tourism supply at market prices and introduces another concept »tourism ratio on supply«. Section 5.3.3 explains the methods for transforming the tourism survey data into the tourism demand by product category. Tourism demand within the TSA framework should be presented by the product category, but the tourism survey data are organised by the tourist consumption components. Some methods are applied here to break down the consumption components into the product categories. Section 5.3.4 presents a new method in our TSA work, that is, a combination for tourism demand estimation from both the tourism demand and tourism supply sides. The tourism survey data are not sufficient enough to cover all the tourism demand that actually exists within the economy. We need to estimate some tourism demand by information from the supply side. A list is given in the section to show the concrete methods used for estimating the tourism demand in each tourism product category. Transformation from the TSA products to the model consumption components is presented in section 5.3.5. The tourism demand is merged into the model system.

### 5.3.1 Data Construction in Regional Supply

We obtained statistical data with very detailed industrial sectors (there are about 820 sectors in the data bank) at a municipal level on employment and primary income from Statistics Denmark. These data are used as the distribution keys to redefine the tourism activities within the traditional standard sectors. For example, in the traditional standard sectors, hotel is presented as one sector. But from the detailed statistical sectoral information, the hotel sector in Denmark is divided into 7 sub-sectors, such as »ho-

tels with restaurants«, »conference centre«, »hotels without restaurants«, »youth hostel«, »camping«, »holiday centre« and »other facilities for short-period stay«. Table 5.1 shows the detailed sub-sectors in the first and second column that are corresponding to their aggregated sectors shown in the third and fourth column.

Table 5.1 Detailed tourism-relevant sectors and their corresponding aggregated standard industrial sectors

| Names of detailed tourism sub-sectors | Codes of sub-sectors | Names of aggregated standard sectors | Codes of standard sectors |
|---|---|---|---|
| Hotels with restaurants | 551110 | Hotels | 551009 |
| Conference centres | 551120 | Hotels | 551009 |
| Hotels without restaurants | 551200 | Hotels | 551009 |
| Youth hostels | 552100 | Hotels | 551009 |
| Camping sites | 552200 | Hotels | 551009 |
| Holiday centres | 552310 | Hotels | 551009 |
| Other accommodation for short-period stay | 552390 | Hotels | 551009 |
| Restaurants | 553000 | Restaurants | 553009 |
| Disco and night clubs | 554000 | Restaurants | 553009 |
| Canteen | 555100 | Restaurants | 553009 |
| Catering and transportable catering service | 555200 | Restaurants | 553009 |
| Railway, passenger transport | 601002 | Transport via railway | 601000 |
| Subway train, bus and other route transport | 602100 | Other scheduled passenger land transport | 602100 |
| Taxi | 602200 | Taxi operation and coach services. | 602223 |
| Other land passenger transport | 602300 | Taxi operation and coach service | 602223 |
| Ferry and other water passenger transport | 611020 | Water transport | 610000 |
| Water transport inland | 612000 | Water transport | 610000 |
| Route air transport | 621000 | Air transport | 620000 |
| Charter and taxi air transport | 622000 | Air transport | 620000 |
| Toll of highway, bridges and tunnels | 632130 | Support transport activities and travel agency | 631130 |
| Yacht harbour | 632220 | Support transport activities and travel agency | 631130 |
| Tourist bureau | 633010 | Support transport activities and travel agency | 631130 |
| Travel agency, tour operators | 633020 | Support transport activities and travel agency | 631130 |
| Travel agency, ticket booking | 633030 | Support transport activities and travel agency | 631130 |
| Holiday cottage rental | 703130 | Letting non-residential building | 701109 |
| Car rental | 711000 | Renting of machinery and equipment etc. | 710000 |
| Congress fair and exhibition activities | 748440 | Other business service | 748009 |
| Amusement parks | 923300 | Recreation, cultural, sporting activities (both market and non-market) | 920001 + 920002 |
| Museum | 925200 | Recreation, cultural, sporting activities (both market and non-market) | 920001 + 920002 |
| Botanical garden and zoo | 925300 | Recreation, cultural, sporting activities (both market and non-market) | 920001 + 920002 |
| Sports facilities | 926100 | Recreation, cultural, sporting activities (both market and non-market) | 920001 + 920002 |

The procedure of data construction takes place in the following two sections.

## Supply share

The detailed industry data are simply put into the model system in the data section. The data are used to calculate a supply share for a tourism industry.

The shares of both employment and primary income in each sector are calculated as:

$$QAEQ = qae / Tqae \quad (1)$$

$$YLRAEQ = ylrae / Tylrae \quad (2)$$

Where a = 1, 2, …, 16; e = 1, 2, …, 32.
QAEQ and YLRAEQ are *supply shares* estimated by employment and income respectively. qae is employment, and ylrae is primary income data with a regional dimension (a) and detailed sectors (e). Tqae or Tylrae are the aggregated data for the standard sectors, respectively.

The *supply share* represents a portion of each sub-sector in the aggregated standard sector within a region. For example, supply share for subsector »hotels with restaurants« is the share of this sub-sector in the traditional »hotel sector«. The supply shares in these 7 hotel sub-sectors will add up to one within each region. Table 5.2.1 and 5.2.2 show the regional supply shares estimated by the detailed employment data in the hotel subsectors. It shows that the supply shares can be quite different from one region to another. Some regions have higher shares in »hotels with restaurants« others have relatively higher shares in »conference centres« or »camping sites«.

Table 5.2.1 Regional supply shares in hotel sub-sectors in the eastern regions of Denmark (%)

| Hotel sub-sectors: | Codes | KK | FK | KA | FA | RA | VS | ST | BO |
|---|---|---|---|---|---|---|---|---|---|
| Hotels with restaurants | 551110 | 75.7 | 71.8 | 60.1 | 38.3 | 82.2 | 55.4 | 62.6 | 72.3 |
| Conference centres | 551120 | 0.0 | 3.9 | 37.5 | 45.5 | 4.6 | 28.5 | 13.2 | 0.4 |
| Hotels without restaurants | 551200 | 21.6 | 22.4 | 0.8 | 0.7 | 0.7 | 0.4 | 1.6 | 5.7 |
| Youth hostels | 552100 | 2.3 | - | 0.3 | 2.3 | 3.2 | 6.9 | 10.7 | 7.9 |
| Camping sites | 552200 | 0.2 | - | 1.0 | 6.1 | 2.1 | 4.5 | 9.0 | 7.5 |
| Holiday centres | 552310 | - | - | - | 2.1 | 5.3 | - | 0.1 | 1.5 |
| Other accommo-dation for short period stay | 552390 | 0.2 | 2.0 | 0.3 | 4.9 | 2.1 | 4.3 | 2.8 | 4.6 |
| **Sum** | | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 6.2 |

Note 1) The regional supply shares are calculated by using the detailed information of employment. The shares presented here are QAEQ in formula (1).
2) Region is presented by county: KK-Copenhagen Municipality; FK-Frederiksberg Municipality; KA-County of Copenhagen; FA-Frederiksborg; RA-Roskilde; VS-Vestsjælland; ST-Storstrøms; BO-Bornholm.

Table 5.2.2 Regional supply shares in hotel sub-sectors in the western regions of Denmark (%)

| Hotel sub-sectors: | Codes | FY | SQ | RB | VJ | RK | AR | VI | NO |
|---|---|---|---|---|---|---|---|---|---|
| Hotels with restaurants | 551110 | 69.1 | 74.2 | 80.0 | 67.5 | 79.0 | 70.0 | 67.8 | 75.2 |
| Conference centres | 551120 | 19.2 | 5.7 | 3.4 | 22.4 | 7.3 | 12.0 | 8.7 | 2.7 |
| Hotels without restaurants | 551200 | 1.3 | 1.3 | 0.5 | 1.2 | 3.4 | 0.9 | 1.1 | 3.0 |
| Youth hostels | 552100 | 2.5 | 2.7 | 5.0 | 1.7 | 1.1 | 3.6 | 2.0 | 1.7 |
| Camping sites | 552200 | 6.0 | 13.1 | 10.2 | 6.3 | 7.1 | 6.7 | 19.8 | 8.5 |
| Holiday centres | 552310 | 0.3 | 0.8 | 0.2 | 0.1 | 1.1 | 4.5 | - | 7.6 |
| Other accommo-dation for short period stay | 552390 | 1.6 | 2.2 | 0.8 | 0.9 | 1.0 | 2.2 | 0.7 | 1.3 |
| **Sum** | | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Note: Region is presented by county: FY-Fyn; SQ-Sønderjylland; RB-Ribe; VJ-Vejle; RK-Ringkøbing; AR-Århus; VI-Viborg; NO-Nordjylland.

## Estimation for tourism production, income and employment

YLRAEQ is used as a key to distribute the values of production, intermediate consumption, primary income and other incomes in the aggregated sectors into detailed tourism sectors. QAEQ is used as a key to distribute the employment data from an aggregated sector into the detailed tourism sectors. Take the hotel sector as an example again. For the hotel sector the distribution is carried out by

$$Tqpae_i = qpae_j * QAEQ_i \qquad (3)$$

Where Tqpae is the number of employment in each sub-hotel sector (i); qpae is the number of employment for the aggregated hotel sector (j). This means that if the aggregate »Hotel« sector has 1000 employees, with the help of the distribution key ($QAEQ_i$), these 1000 employees are distributed into 7 sub-hotel sectors.

The same method is used for the values of production, intermediate consumption, primary income and other incomes, which are distributed by YLRAEQ into their corresponding detailed tourism sectors. The formula for the distribution is documented in the following equations.

$$Txae_i = xae_j * YLRAEQ_i \quad (4)$$
$$Txrae_i = xrae_j * YLRAEQ_i \quad (5)$$
$$Tyfae_i = yfae_j * YLRAEQ_i \quad (6)$$
$$Tyflae_i = yflae_j * YLRAEQ_i \quad (7)$$
$$Tyfkae_i = yfkae_j * YLRAEQ_i \quad (8)$$
$$Tyfnae_i = yfnae_j * YLRAEQ_i \quad (9)$$

Where $Txae_i$ is the production value in each detailed tourism sector (i); $xae_j$ is the production value for the aggregated tourism sector (j).
$Txrae_i$ is the intermediate input value in each detailed tourism sector (i); $xrae_j$ is the intermediate input value for the aggregated tourism sector (j).
$Tyfae_i$ is the gross factor income in each detailed tourism sector (i); $yfae_j$ is the gross factor income for the aggregated tourism sector (j).
$Tyflae_i$ is the value of compensation to employees in each detailed tourism sector (i); $yflae_j$ is the value of compensation to employees for the aggregated tourism sector (j).
$Tyfkae_i$ is the gross operating surplus in each detailed tourism sector (i); $yfkae_j$ is the gross operating surplus for the aggregated tourism sector (j).
$Tyfnae_i$ is the net value of commodity tax or subsidiaries in each detailed tourism sector (i); $yfnae_j$ is the net value of commodity tax or subsidiaries for the aggregated tourism sector (j).

From the above formulae it is shown that the supply shares are used as the distribution keys to construct the production, intermediate input consump-

tion, and primary income and employment data for the potential tourism-relevant sectors.

### 5.3.2 Estimation of Tourism Supply at Market Prices and the Tourism Ratio on Supply

The total domestic supply by tourism product is calculated by adding up the total domestic production with the total import at each product level. The production and import are in basis prices. The total supply at basis prices is balanced with the total demand at basis prices. This means that at each commodity level, supply equals demand at basis prices. Implicitly, the total demand at market prices can represent the total supply for commodities at market prices, as we have no information for supply at market prices. In other words, if we have information of the VAT and commodity taxes for each commodity and add these together with the wholesale and retailing margins to the total supply at basis prices for commodities, we will get the total supply at market prices. The total supply for tourism commodities at market prices is the basis for calculating the *tourism ratio on supply*.

The *tourism ratio on supply* represents a share of the tourism demand in the total domestic supply at each product category. For example, for the product of »camping site« and »holiday centres«, we assume that the *tourism ratios on supply* are quite high, or close to one. This means that most of the services in these sectors are relevant to the tourism demand; their supply is simply to meet the tourism demand. On the other hand, *tourism ratio on supply* in the other hotel forms, catering sectors and transport sectors cannot be one, as these sectors also have to meet the demand from local residents. For example, a family of local residents holds a wedding banquet in a hotel, or local residents eat dinner in the restaurants. These kinds of consumption are defined as non-tourism demand. Besides, tourism supply is also the basis for estimating tourism demand in some product categories that are missing from the tourism survey data. This point will be further discussed in the next sections.

### 5.3.3 Estimation of Tourism Demand from the Tourism Survey

Tourism demand at national and regional level should be estimated by both the tourism survey information and the national make and use matrices. In the use matrices, we can find the information about the use of tourism commodities. Tourism commodities are mainly used by private consumption. The private consumption consists of local private consumption, domestic tourism consumption and foreign tourism consumption. However, the national use matrix has neither information concerning tourism consumption versus local private consumption, nor information of regional tourism and local private consumption. Therefore, the tourism survey data is very important information, which is available to identify some tourism consumption categories, and it has regional tourism consumption information.

In the TØBBE data, the tourism consumption is presented by consumption components, namely, by the groups of commodities. Therefore, we have to transform TØBBE components into the model's consumption components, then to split consumption components into the detailed commodities. As mentioned above, the TØBBE data are regional data and are also available for identifying the different types of tourism, such as domestic private tourism, domestic business tourism, foreign same-day tourism and foreign overnight tourism. Besides, the TØBBE data can also identify the different tourist nationalities and the different types of accommodation.

The transformation of the TØBBE components into the detailed commodities is carried out in two steps: 1) from the TØBBE consumption components to the model's consumption components; 2) from the model's consumption components to the detailed commodity categories.

## Transformation from the TØBBE components to the model's components

Table 5.3 Transformation of tourism consumption components into model's consumption components

| Codes for tourism components | Explanation for the codes in TØBBE | Codes of components in the model's data level | Explanation for the codes in the model | Codes of components in the model's construction |
|---|---|---|---|---|
| A | Food | CPD1110-CPD1190 | Various food components | CPK1110 |
| B | Beverage | CPD1210-CPD2130 | Various drink components | CPK1120 |
| C | Tobacco | CPD2210 | Tobacco | CPK1130 |
| D | Restaurants, café | CPD9810 | Restaurants | CPK9810 |
| E | Entertainment | CPD9400 | Entertainment | CPK9400 |
| F | Petroleum use in cars | CPD7220 | Petroleum | CPK7220 |
| G | Local transport | CPD7300 | Local transport | CPK7300 |
| H | Clothing and footwear | CPD3110, CPD3200 | Clothing and footwear | CPK1141 |
| I | Audio-visual, photo and data equipments | CPD9110-CPD9150 | Various audio-visual, photo and data equipments | CPK1150 |
| J | Jewellery, watches, etc | CPD9921 | Jewellery and watches | CPK1160 |
| K | Other services | CPD3140<br>CPD7210<br>CPD7240<br>CPD8100<br>CPD9300<br>CPD9510<br>CPD9530<br>CPD9600<br>CPD9911<br>CPD9912<br>CPD9922<br>CPD9940<br>CPD9950<br>CPD9960 | Dry cleaning<br>Repairs of motor vehicles<br>Personal transport service<br>Tele-communication<br>Other items for recreation<br>Books and newspapers<br>Stationery, study materials<br>Package holidays<br>Hairdressing<br>Other personal care articles<br>Other personal service<br>Insurance<br>Financial services<br>Other service | CPK1181<br>CPK7210<br>CPK7210<br>CPK1182<br>CPK9300<br>CPK1171<br>CPK1171<br>CPK9600<br>CPK1181<br>CPK1181<br>CPK1181<br>CPK1182<br>CPK1182<br>CPK9960 |
| L | Hotels and other accommodation | CPD9820 | Hotels and other accommodation | CPK9820 |
| M | Expenditure on summer cottage | CPD4100-CPD4540 | Actual and imputed rental housing and consumption electricity, water, gas and fuels | CPK4100<br>CPK4510 |

Table 5.3 shows how we transformed the TØBBE tourism consumption components into the model's consumption components. From the table it is

seen that some components are simply transformed from one to another, such as »tobacco« to »tobacco«, or »restaurant« to »restaurant«. Some of the TØBBE consumption components have to be transformed from one category to several categories, for example, »food« is transformed into several food components in the model, and »other service« is transformed into different service categories. This transformation is made by using the shares of the private consumption in each sub-category. The significance for this transformation is that we assume tourists consumed a basketful food and series of services, including private and public service and other communication, insurance and financial services. The last column in table 5.3 shows the codes for the private consumption components in the data construction level. The purpose for the data construction is to avoid too many detailed categories; therefore some detailed categories are aggregated into one.

### Transformation from the consumption components to commodity categories

Table 5.4 shows the transformation between the model's consumption components and the model's commodity categories. The tourism consumption by non-tourism-specific components is simply transformed into corresponding non-tourism-specific commodities, such as tourism consumption for food, drinks and tobacco is transformed into the aggregated commodity for food, drink and tobacco in the model. Tourism consumption for clothing and footwear is transformed into the aggregated textile and footwear commodity. Tourism consumption in the different categories of private service is aggregated into the private service category. On the other hand, tourism consumption by tourism-specific components has to be expanded in order to show the detailed tourism commodities.

Table 5.4 Transformation of the consumption components into commodities

| Code for consumption components | Explanation for the codes | Code for aggregate commodities in model | Explanation for the codes |
|---|---|---|---|
| CPK1110<br>CPK1120<br>CPK1130 | Food<br>Beverage<br>Tobacco | VAK014000 | Aggregate food commodities |
| CPK1141 | Clothing and footwear | VAK020000 | Aggregate textile commodities |
| CPK1150 | Audio-visual, photo and data equipments | VAK050000 | Electronic commodities |
| CPK1160 | Jewellery, watches, etc. | VAK110000 | Toy, jewellery and watches |
| CPK1171<br>CPK1181<br>CPK7210<br>CPK9300<br>CPK9600 | Books and newspapers<br>Other private services<br>Maintenance and repair<br>Other recreation items<br>Packaged holidays | VAK154000 | Other private services |
| CPK1182 | Communication, insurance and finance | VAK153000 | Communication, insurance and finance |
| CPK7220* | Fuels used by transport vehicles | VAK011209<br>VAK601002<br>VAK602300<br>VAK611020 | Ref. table 5.5.1 and table 5.5.2 |
| CPK7300* | Transport service | VAK602000<br>VAK602100<br>VAK602223 | Ref. table 5.6 |
| CPK9400* | Recreation and cultural service | VAK923300<br>VAK925200<br>VAK925300<br>VAK926100 | Ref. table 5.7 |
| CPK9810 | Restaurants, café | VAK553009<br>VAK554000 | Restaurants and night club |
| CPK9820* | Hotels and other accommodation | VAK551100-<br>VAK552390* | Ref. table 5.8 |
| CPK4100<br>CPK4510 | Expenditure on summer cottage | VAK703130<br>VAK151000 | Holiday cottage rental and consumption on energy |

Note: * These consumption components will be further split up into different commodities, ref. the relevant tables.

In the list of the commodity categories, there are several commodities that belong to a single consumption component, for example, »subway train« (VAK602000), »buses« (VAK602100) and »taxi« (VAK602223) are the commodity categories that belong to the same »transport service« (CPK7300) component. It is the same for other consumption components, such as »fuels used by transport vehicles« (CPK7220), »recreation and cultural service« (CPK9400), and »hotels and other accommodation« (CPK9820). These consumption components should be further split up into their corresponding tourism-specific commodities by different methods.

Tourism consumption at component F from the TØBBE data is defined as the tourist consumption at both long-distance transport services and petroleum consumption. Tourism consumption at component F is transformed into the model consumption component (CPK7220) (See table 5.3). The information from both the national accounts and the TØBBE data should be used to estimate the tourism consumption in the different TSA product categories concerning the long-distance transport services and the petroleum consumption.

As one of the objectives for TSA is to maintain the links to the existing national accounts, the estimated tourism consumption at each product category should not exceed the national private consumption. The data for the national private consumption at each product category are available from the national use table. The private consumption at »air transport« and »charter air transport« is, by definition, the tourism consumption. The argument is that if a person travels by airplane from one place to another for a private purpose, the consumption related to this travel is tourism consumption, ref. to the section of »definition of tourism-related terms«. Therefore, the domestic private tourism consumption and the foreign overnight tourism consumption at these two product categories are estimated by the national private consumption at these categories. The private consumption at »ferry, passenger« covers the consumption by both tourist who travel for leisure and business, and local residents who commute to their jobs. The tourism consumption at this category is estimated by private consumption multiplied with a fixed share. (The fixed share is estimated by an assumption that 50% of ferry users are tourist at present).

The distribution of both domestic and foreign tourism consumption at component F to the other product categories including tourism consumption at petroleum is shown in table 5.5.1. It should be noticed here that tourism consumption at the three products (i.e. railway, passenger, land passenger and petroleum) are estimated by the TØBBE data at component F by giving a fixed share to each product. The other three products (i.e. air transport, charter air transport and ferry, passenger) are estimated by private consumption in the national use table. Therefore the total estimate for the long-distance transport the petroleum consumption will be greater than the data shown by the TØBBE data at component F.

Table 5.5.1 Distribution of Danish and foreign tourism consumption on petroleum consumption and other long-distance transport into different product categories

| Codes for products | Name of products | Share of distribution for Danish tourist consumption (%) | Share of distribution for foreign tourist consumption (%) |
|---|---|---|---|
| VAK612002 | Railway, passenger | 15 | 6 |
| VAK602300 | Land, passenger | 10 | 10 |
| VAK611020 | Ferry, passenger | Estimated by private consumption at ferry, passenger with a fixed share | Estimated by private consumption at ferry, passenger with a fixed share |
| VAK621000 | Air transport | Estimated by private consumption at air transport | Estimated by private consumption at air transport |
| VAK622000 | Charter air transport | Estimated by private consumption at charter air transport | Estimated by private consumption at charter air transport |
| VAK011209 | Petroleum consumption | 50 | 50 |

The Danish business tourism consumption at long-distance transport and petroleum is estimated by another distribution key as shown in table 5.5.2. The method is the same for business tourism consumption at »air transport« and »charter air transport«, that is, by definition, they are tourism consumption. If a person travels by airplane from one place to another for a business purpose, the consumption related to this travel is tourism consumption.

Table 5.5.2 Distribution of Danish business tourism consumption on petroleum consumption and other long-distance transport into different product categories

| Codes for products | Name of products | Share for distribution (%) |
|---|---|---|
| VAK601002 | Railway, passenger | 20 |
| VAK602300 | Land, passenger | 4 |
| VAK611020 | Ferry, passenger | Estimated by intermediate consumption at ferry, passenger with a fixed share |
| VAK621000 | Air transport | Estimated by intermediate consumption at air transport |
| VAK622000 | Charter air transport | Estimated by intermediate consumption at charter air transport |
| VAK011209 | Petroleum consumption | 35 |

The Danish business tourism consumption at these two products is estimated by intermediate consumption at these two product categories from the national use table. The business consumption at »ferry, passenger« is also estimated by intermediate consumption multiplied with a fixed share. The Danish business tourism consumption at the other three products (i.e. railway passenger, land passenger and petroleum) is estimated by the TØBBE data at component F by giving a fixed share to each product.

The tourism consumption on »local transport« is distributed according to the shares shown in table 5.6. As in the TØBBE interviewing, it contains a question of »how much a tourist spends on the local transportation«. But the information does not provide us with what kinds of local transportation are used by the tourists. The shares for distributing the local transport into three kinds of local transport modes are provided by VisitDenmark by investigating the relationships between the tourism consumption in the TØBBE data and the private consumption in the national accounts. They should also take into account the TSA experience from other countries. Considering different tourists have different patterns of using the local transport, two columns are given in table 5.6. One column shows the shares given for distributing the Danish tourism consumption; another is the shares for distributing the foreign tourist consumption. It is seen that the domestic tourists tend to used more »buses« and »subway train« than the foreign tourists, while the foreign tourists tend to use more »taxi« than the domestic tourists.

Table 5.6 Distribution of Danish and foreign tourism consumption on local transport into different transport products

| Codes for products | Name of products | Share of distribution for Danish tourist consumption (%) | Share of distribution for foreign tourist consumption (%) |
|---|---|---|---|
| VAK602000 | Subway train | 10 | 6.73 |
| VAK602100 | Buses and other route transport | 55 | 26.82 |
| VAK602223 | Taxi | 35 | 66.45 |
| | Total | 100 | 100.00 |

The tourism consumption on entertainment is distributed according to the information from the private household consumption survey in Statistics Denmark. The statistical information shows how much the Danish house-

holds consumed on different recreation and cultural activities during the period 1997-2001. The average share of each tourism product for this period is estimated as shown in table 5.7. These shares are used to distribute the consumption component »entertainment« into five recreation products as shown in the table.

Table 5.7 Distribution of tourism consumption on recreation into different recreation products

| Codes for products | Name of tourism products | Share for distribution (%) |
|---|---|---|
| VAK923300 | Amusement parks | 60 |
| VAK925200 | Museum | 3 |
| VAK925300 | Botanical garden and zoo | 3 |
| VAK926100 | Sports facilities | 9 |
| VAK156009 | Other recreation and cultural activities | 25 |
| | Total | 100 |

The tourism consumption at hotel and other accommodation in the TØBBE data is simply presented by two categories (L and M). The tourist expenditure at M category can be transformed into the tourism product called »holiday cottage rental«, as it exists in the national account. However, the expenditure at L category should be further split up into different tourism products, such as from the »hotel with restaurant« (commodity code is 551110) to »other accommodation for short-period stay« (552390) and »yacht harbour« (632220).

Fortunately, the TØBBE data have information on types of accommodation; it can be used to transform the TØBBE data from the tourism consumption at different types of accommodation to the tourism products. Table 5.8 shows the relationship between the types of accommodation from TØBBE and the tourism products in the model. It is seen that the transformation is not precise, as there is no precise linkage between these two categories. We first transform the tourism consumption at the four types of hotels into the four forms of hotel products, as shown in the table as a united consumption at hotels, and then we use the private consumption data from the national use matrix to distribute this consumption further into each hotel product.

As shown from the table, the other types of accommodation are simply transformed into their corresponding product categories, such as »camp-

ing« to »camping«, »youth hostel« to »youth hostel« and »holiday centre« to »holiday centre«. The category in »rented summer cottages« is transformed into product category »holiday cottage rental«. The other two forms of »summer cottages«, namely »own« and »borrowed summer cottages« are transformed into »dwelling«. All the transformation is carried out with the exception of »festival«, »farm« and »cruise ships«. There are no product categories called »festival«, »farm« and »cruise ships« in the national make and use tables. Therefore, we have to find some product categories that are the most similar to these three categories. We decide to put tourism consumption at »festival« and »farm« into the »camping« category, as they are more similar to each other and the national use matrix also shows relatively large private consumption in camping.

Table 5.8 Transformation of TØBBE's accommodation into tourism products

| Code for TØBBE's types of accommodation | Explanation for types of accommodation in TØBBE | Code for aggregate commodities in the model | Explanation for commodities in the model |
|---|---|---|---|
| HotelF | Hotel – holiday | 551110 + 551120 + 551200 | Hotel with/without restaurant, conference centre |
| HotelB | Hotel – business | Same as above | Same as above |
| HotelM | Hotel – conference | Same as above | Same as above |
| HotelA | Hotel – others | Same as above | Same as above |
| Camp | Camping | 552200 | Camping |
| Vandre | Youth hostel | 552100 | Youth hostel |
| Sumhus | Rented summer cottage | 703130 | Holiday cottage rental |
| Sumege | Owned summer cottage | 702009 | Dwelling |
| Sumlon | Borrowed summer cottage | 702009 | Dwelling |
| Ferie | Holiday centre | 552310 | Holiday centre |
| Fest | Festival | 552200 | Camping |
| Lyst | Yacht harbour | 632220 | Yacht harbour |
| Bonde | Farm | 552200 | Camping |
| Kryds | Cruise ships | 552390 | Accommodation for short-period stay |

Tourism consumption at »cruise ships« is transformed into »other accommodation for short-period stay« (552390), as recommended by the TSA documents. There are two other types of accommodation in the TØBBE data base, i.e. »visiting family and friends« and »same-day visit«. As these types of tourists have no spending on accommodation, we do not need to make distribution.

### 5.3.4 A New Method – Combination of Estimations from Both Tourism Demand and Tourism Supply Sides

As mentioned above, TØBBE data are the tourism survey data. The tourism consumption in TØBBE is the product of the number of tourist nights multiplied by the average daily consumption. The average daily consumption is estimated by the tourist interviewing samples. The tourism consumption for hotel spending at each type of accommodation can be different from the data in the national private consumption. The tourism consumption is part of the private consumption in the model and it cannot exceed the private consumption. Therefore, the tourism consumption data at hotel and other accommodation will be adjusted by the national private consumption in these categories in order to have the consistency. Besides, the tourism demand in some important tourism product categories, such as »travel agency«, »tourist bureau« and »car rental« is unavailable in the survey data. Several tourism consumption data have to be supplemented by the tourism supply data.

In order to give an accurate estimation of the tourism demand that covers all the tourism products, we have to use a method that combines both the demand estimation from the survey data and the supply estimation from the national make matrix. The national make matrix shows production output by industrial and service sectors for each product. For those tourism products that have no information from the tourism survey data, we can estimate them from the supply data.

The TSA documents provide us with the methodology for constructing tourism demand data. With regards to the methodology, the documents suggest to have three ways to collect information on internal tourism consumption: a) direct information from suppliers (information on their classes of customers); b) from visitors (sample surveys of expenditure by products); c) from opinions of experts familiar with the relationships (ref. RMF, page 63).

The principles for applying the mixed methodology to estimate the tourism demand are: a) when the tourism survey data are available, we shall use the tourism survey data as the tourism demand; b) when the tourism survey data are not consistent with the national use table, especially when the tourism demand data from the survey exceed the national private

consumption data, we shall adjust the tourism survey data by the national use data; c) when the tourism demand data are not available in some important tourism product categories, we shall use the tourism supply information to estimate the tourism demand.

Table 5.9 shows the method of the combination of both tourism demand and tourism supply estimations. The first column gives the names of the Danish TSA specific and non-specific products. The second column shows the product codes within the Danish national accounts. The third column shows that the tourism demand is estimated by the TØBBE data. The fourth column shows that the tourism demand is estimated by the information from the national use table. The last column shows that the tourism demand is estimated by the information from the national supply table. After the estimation of the tourism demand, the tourism consumption in these product categories will be sent to Statistics Denmark and the relevant companies for their evaluation. From the table it is easy to find how the tourism demand is estimated.

The tourism demand for various accommodation products is necessary to be adjusted by the national private consumption data, as in principle the private tourism consumption cannot exceed the total private consumption. The adjustment is made only at the national total consumption. This means that the patterns of the tourism consumption by different groups of tourism, such as by domestic and foreign tourism or by different regions, are exactly the same as the tourism survey data. The method used here is the scaling method, i.e. every cell of the data is scaled down in order to be adjusted to match the total private consumption.

Table 5.9 Combination of both tourism demand and tourism supply estimations

| Name of products | VAK codes | TØBBE data | National use table | National supply table |
|---|---|---|---|---|
| **TSA specific products:** | | | | |
| Hotels with restaurants | 551110 | X | * | |
| Conference centre | 551120 | X | * | |
| Hotels without restaurants | 551200 | X | * | |
| Youth hostels | 552100 | X | * | |
| Camping sites | 552200 | X | * | |
| Holiday centres | 552310 | X | * | |
| Other short-stay accommodation | 552390 | X | * | |
| Restaurants | 553000 | X | | |
| Disco and night clubs | 554000 | X | | |
| Canteen | 555100 | NA | | |
| Catering and transportable catering service | 555200 | NA | | |
| Railway, passenger transport | 601002 | X | | |
| Subway train | 602000 | X | | |
| Bus and other route transport | 602100 | X | | |
| Taxi | 602200 | X | | |
| Other land passenger transport | 602300 | X | | |
| Ferry and other water passenger transport | 611020 | X | | |
| Water transport, inland | 612000 | | X | |
| Route air transport | 621000 | | X | |
| Charter and taxi air transport | 622000 | | X | |
| Toll for highways, bridges and tunnels | 632130 | | X | |
| Yacht harbour | 632220 | X | * | |
| Tourist bureau | 633010 | | X | |
| Travel agency, tour operators | 633020 | | | X |
| Travel agency, ticket booking | 633030 | | X | |
| Holiday cottage rental | 703130 | X | * | |
| Car rental | 711000 | | | X |
| Congress fair and exhibition activities | 748440 | NA | | |
| Amusement parks | 923300 | X | | |
| Museum | 925200 | X | | |
| Botanical garden and zoo | 925300 | X | | |
| Sports facilities | 926100 | X | | |
| **Non-specific products:** | (aggregated codes) | | | |
| Agriculture and fishing | 011009 | | | |
| Oil, natural gas and petroleum | 011209 | X | | |
| Food, drinks and tobacco | 014000 | X | | |
| Textile and clothing industry | 020000 | X | | |
| Electronic industry | 050000 | X | | |
| Toy, gold and silver products | 110000 | X | | |
| Manufacturing | 140009 | X | | |
| Housing and energy supply | 151000 | | | |
| Construction | 152000 | | | |
| Post, bank and insurance | 153000 | X | | |
| Private services | 154000 | X | | |
| Public services | 155000 | X | | |
| Other recreation and culture | 156009 | X | | |

Note: The mark X means the choice of the methods for the estimation. The mark * means that the tourism demand of the product has been adjusted by the national use table, i.e. by the national private consumption data.

Table 5.9 shows that some TSA products are estimated by the information from the national use table, i.e. the national private consumption. By defini-

tion, the private consumption at »water transport inland« (VAK612000) is tourism consumption, because this consumption is typically related to the residential consumption on boating and other recreational activities at inland waters. The private consumption at »tourist bureau« (VAK633010) and »travel agency, ticket booking« (VAK633030) by definition are tourism consumption. Therefore both private consumption and intermediate consumption at these two products are defined as tourism consumption. For the product category »toll for highways, bridges and tunnels« (VAK632130), a part of private consumption is tourism consumption, another part is the consumption by commuters; therefore, a distribution share (53.5%) is given to the tourism consumption according to the survey data.

Two categories »travel agency, tour operators« (VAK633020) and »car rental« (VAK711000) are not estimated by the demand data, as there is no information from the survey data. They are estimated by the supply information at the moment, by giving tourism ratios on supply. When the interviewing data are available for these two categories, we shall make changes on the estimation by the survey data.

### 5.3.5 Transformation from the TSA Products to the Model's Consumption Components

The tourism demand by the TSA product categories shall be transformed into the consumption components again. This is because the modelling is conducted in the component dimension for the private consumption. In the model, the local private consumption is obtained by subtracting different parts of the tourism consumption in the corresponding components from the total private consumption.

The transformation from the TSA products to the model's consumption components follows the relations between the commodities and components in the data of national private consumption. For most of non-specific tourism products, they are kept the same as shown in the table 5.4. Some special TSA products are transformed into the consumption components listed in Table 5.10. In principle, they should be the same as in the table 5.4, but because of new estimations as shown in tables 5.5.1 to 5.8, it is better to give a new table here.

Table 5.10 shows that all the products related to the »hotels and other accommodation« (from VAK551110 to VAK552390) are transformed into the component »hotels and other accommodation« (CPK9820) and the products concerning »restaurants and catering« are transformed into the component »restaurants and catering« (CPK9810). Many transport services, covering from the railway passenger, local transport, other land passenger, ferry and water transport and route air transport, to the tourist bureau and travel agency, are all transformed into one consumption component (i.e. CPK7300).

The »travel agency, tour operator« is different from the other travel agency, because in the national private consumption, this product category is linked to the »package holiday« (CPK9600). The »toll of highways, bridges and tunnels« and the »car rental« are transformed into personal transport services together with the transport vehicles maintenance and repairs (CPK7210/ CPK7240). The tourism products relating to cultural and recreational services are transformed into the component »recreation and cultural service« (CPK9400).

Table 5.10 Relationships between some special TSA products and tourism consumption components

| Code for tourism products (VAK) | Explanation for tourism products | Code for tourism components (CPK) | Explanation for tourism components |
|---|---|---|---|
| 551110 | Hotels with restaurants | 9820 | Hotel and other accommodation |
| 551120 | Conference centre | 9820 | Hotel and other accommodation |
| 551200 | Hotels without restaurants | 9820 | Hotel and other accommodation |
| 552100 | Youth hostels | 9810/9820 | Hotel and other accommodation |
| 552200 | Camping sites | 9820 | Hotel and other accommodation |
| 552310 | Holiday centres | 9810/9820 | Hotel and other accommodation |
| 552390 | Other short-stay accommodation | 9810/9820 | Hotel and other accommodation |
| 553000 | Restaurants | 9810 | Catering service |
| 554000 | Disco and night clubs | 9810 | Catering service |
| 601002 | Railway, passenger transport | 7300 | Transport service |
| 602000 | Subway train | 7300 | Transport service |
| 602100 | Bus and other route transport | 7300 | Transport service |
| 602200 | Taxi | 7300 | Transport service |
| 602300 | Other land passenger transport | 7300 | Transport service |
| 611020 | Ferry and other water passenger transport | 7300 | Transport service |
| 612000 | Water transport, inland | 7300 | Transport service |
| 621000 | Route air transport | 7300 | Transport service |
| 622000 | Charter and taxi air transport | 7300 | Transport service |
| 633010 | Tourist bureau | 7300 | Transport/recreation service |
| 633030 | Travel agency, ticket booking | 7300 | Transport service |
| 632220 | Yacht harbour | 9300 | Other recreation items/equipments |
| 633020 | Travel agency, tour operators | 9600 | Package holiday |
| 702009 | Imputed rental in house | 4100 | Housing |
| 703130 | Holiday cottage rental | 4100 | Housing |
| 632130 | Toll for highways, bridges | 7210/7240 | Transport service and maintenance |
| 711000 | Car rental | 7210/7240 | Transport service and maintenance |
| 011209 | Oil, natural gas and petroleum | 7220 | Fuels used by transport vehicles |
| 156009 | Other recreation activities | 9400 | Recreation and cultural service |
| 923300 | Amusement parks | 9400 | Recreation and cultural service |
| 925200 | Museum | 9400 | Recreation and cultural service |
| 925300 | Botanical garden and zoo | 9400 | Recreation and cultural service |
| 926100 | Sports facilities | 9400 | Recreation and cultural service |

# 6 RTSA Results

The TSA tables, shown in this section, are aggregated national TSA tables. The regional TSA tables are available in the model system that will be used by VisitDenmark for the regional tourism analysis.

Due to the confidentiality of the detailed TSA statistics, we shall not present the regional TSA tables that contain the information of detailed sectors and products. TSA data are constructed on the basis of estimations of tourism consumption at detailed commodities and services information from the national accounts. The advantage in the model system is that the model-presenting system can be made in a way to present the data at a more aggregated industry and product level.

The tourism industries are aggregated into eight industries, listed below:

1. Hotels – including hotels and other accommodation sectors.
2. Second homes – including summer cottage rental and the real estate agencies.
3. Restaurants – including restaurants and other catering businesses.
4. Local transport – including subway, buses and taxies.
5. Long distance transport – including railway, water and air transport.
6. Travel agency and transport service – including travel agencies, tourist bureaus and other transport services.
7. Transport and equipment rental – including car and computer rental businesses.
8. Recreation and cultural activities – including recreational, cultural and sport sectors.

All the other industries shown in TSA table 5 are aggregated as one non-tourism industry; in the model system, however, the non-tourism industries are disaggregated into several industries in order to distinguish the key economic sectors, such as agriculture, manufacture and energy, etc. There is one tourism-connected industry in TSA Table 5, showing those industries that are related to the tourism industries, such as the transport supporting industries.

TSA products are aggregated as follows:

*The tourism specific products:*

1. Hotels – including hotels with/without restaurants and conference centre.
2. Other accommodations – including hostels, camping sites and holiday centre.
3. Restaurants and other caterings – including restaurants and other catering, night clubs and canteen.
4. Local transport – including subway, buses and taxies.
5. Long-distance transport – including railway passenger, water passenger transport and air transport.
6. Travel agency and transport service – including the travel agencies and tourist bureaus, payment for using tunnels and bridges, and payment for using the yacht harbours.
7. Holiday cottage and car rental – including the summer cottage rental and car rental.
8. Cultural and recreational service – including the amusement parks, museums, botanical garden and zoo, sport activities.

*The non-specific tourism products:*

9. Agricultural products – including agriculture, forest and other primary products.
10. Petroleum – including the oil, gas and petroleum products.*
11. Food, drinks and tobacco – including all kinds of food, drink and tobacco products.*
12. Clothes and footwear – including textile products, dressing and leather products.*

13. Consumer electronics – including computer, radio, TV, camera and other consumer electronic products.*
14. Jewellery and watches – toys, watches and jewellery.*
15. Other manufacturing – All other industrial products.
16. Housing and energy – expenses on house, electricity, gas and other energy supply.
17. Construction
18. Business and private service – including telecommunication, finance and insurance services.*
19. Public service – including educational and social institutional services.
20. Other services – including all kinds of services.

Within the non-specific tourism products, the products with * marks are tourism-connected products. These products are also consumed by the tourists; therefore, these six non-specific tourism products will be shown in Table 1-4. All of the 12 non-specific tourism products will be shown in Table 5 and Table 6, where the national production accounts are given in Table 5.

TSA table 1 (Table 6.1) shows the inbound tourism consumption in Denmark in 2000. The table shows the tourism consumption by products (row) and categories of visitors (column). The products are classified by two types: tourism specific products and non-specific tourism products. The categories of visitors are foreign same-day visitors and foreign overnight tourists.

The total inbound tourism consumption in Denmark in 2000 is 28 239 million DKK (3 800 million EURO). The tourism consumption from the foreign same-day visitors accounts for 41% of the total consumption, while the foreign overnight tourism consumption accounts for 59% of the total inbound tourism consumption.

The tourism consumption from the foreign same-day visitors are mainly concentrated on the non-specific tourism products, such as food, drink, clothes and footwear, petroleum and other services. The non-specific tourism products accounted for 79%, while the tourism specific products accounted for only 21%. The foreign overnight tourists consumed 61% of

tourism specific products, in which 44% of consumption is at hotels, restaurants, and other accommodation and summer cottages. The non-specific tourism products accounts for 39% of the consumption.

TSA table 2 (Table 6.2) shows the domestic private tourism consumption in 2000, by products and types of tourism. The domestic private tourism consumption covers only the Danish private tourism consumption; it does not include the consumption from the domestic business visitors. The domestic private consumption is also classified by two types: the domestic same-day visitors and the domestic overnight tourists. The data for the domestic same-day visitors are not available at the moment; however, VisitDenmark is planning to collect the data in the near future.

The tourism consumption from Danish private overnight tourists in 2000 is 14 685 million DKK (1 978 million EURO). The domestic private overnight tourists consumed 55% of non-specific tourism products and 45% of the tourism specific products.

We should mention here that the tourism consumption at hotel and other accommodation has been scaled down in accordance with the data from the total private consumption at hotel and other accommodation in the national accounts (ref. in section 5.3). Therefore the tourism consumption data at hotels and other accommodation seem to be lower, than other consumption groups.

TSA Table 3 should show the outbound tourism consumption by products and categories of visitors. This table is not available for the Danish TSA at the moment.

Table 6.1 TSA Table 1 – Inbound tourism consumption in 2000, by products and categories of visitors (in million DKK, current price)

| **Tourism specific products:** | **Same-day visitors** | **Share (%)** | **Tourists** | **Share (%)** | **Total visitors** |
|---|---|---|---|---|---|
| Hotels | 0 | 0 | 1 653 | 9.9 | 1 653 |
| Other accommodation | 0 | 0 | 457 | 2.7 | 457 |
| Restaurants and other caterings | 1 321 | 11.4 | 2 606 | 15.6 | 3 927 |
| Local transport (subway, bus and taxi) | 451 | 3.9 | 258 | 1.6 | 709 |
| Long distance transport (railway, water and air) | 488 | 4.2 | 1 040 | 6.2 | 1 528 |
| Travel agency and transport services | 0 | 0 | 1 064 | 6.4 | 1 064 |
| Holiday cottage and car rental | 0 | 0 | 2 632 | 15.8 | 2 632 |
| Cultural and recreational services | 135 | 1.2 | 405 | 2.4 | 540 |
| *Tourism specific products, sub-total:* | *2 395* | *20.7* | *10 116* | *60.7* | *12 511* |
| **Non-specific tourism products:** | | | | | |
| Petroleum | 1 835 | 15.9 | 1 058 | 6.4 | 2 894 |
| Food, drinks and tobacco | 3 256 | 28.2 | 2 319 | 13.9 | 5 575 |
| Clothes and footwear | 1 144 | 9.9 | 1 070 | 6.4 | 2 214 |
| Consumer's electronics | 87 | 0.8 | 95 | 0.6 | 181 |
| Jewellery and watches | 148 | 1.3 | 213 | 1.3 | 361 |
| Other services | 2 704 | 23.4 | 1 800 | 10.8 | 4 503 |
| *Non-specific tourism products, sub-total:* | *9 173* | *79.3* | *6 555* | *39.3* | *15 728* |
| **Tourism consumption, total:** | **11 569** | **100.0** | **16 671** | **100.0** | **28 239** |

Source: own calculation is taken on the basis of the data sources from Statistics Denmark and VisitDenmark.

Table 6.2 TSA Table 2 – Domestic private tourism consumption in 2000, by products and types of tourism (in million DKK, current price)

| **Tourism specific products:** | **Same-day visitors** | **Tourists** | **Share (%)** | **Total visitors** |
|---|---|---|---|---|
| Hotels | na | 564 | 3.8 | 564 |
| Other accommodation | na | 873 | 5.9 | 873 |
| Restaurants and other caterings | na | 1 696 | 11.6 | 1 696 |
| Local transport (subway, bus and taxi) | na | 613 | 4.2 | 613 |
| Long distance transport (railway, water and air) | na | 1 115 | 7.6 | 1 115 |
| Travel agency and transport services | na | 943 | 6.4 | 943 |
| Holiday cottage and car rental | na | 437 | 3.0 | 437 |
| Cultural and recreational services | na | 393 | 2.7 | 393 |
| *Tourism specific products, sub-total:* | *na* | *6 634* | *45.2* | *6 634* |
| **Non-specific tourism products:** | | | | |
| Petroleum | na | 836 | 5.7 | 836 |
| Food, drinks and tobacco | na | 3 738 | 25.5 | 3 738 |
| Clothes and footwear | na | 940 | 6.4 | 940 |
| Consumer's electronics | na | 164 | 1.1 | 164 |
| Jewellery and watches | na | 572 | 3.9 | 572 |
| Other services | na | 1 802 | 12.3 | 1 802 |
| *Non-specific tourism products, sub-total:* | *na* | *8 051* | *54.8* | *8 051* |
| **Tourism consumption, total:** | | **14 685** | **100.0** | **14 685** |

Source: own calculation is taken on the basis of the data sources from Statistics Denmark and VisitDenmark.

Note: na means that data are not available at moment.

TSA table 4 (Table 6.3) is the internal tourism consumption by products and types of tourism. The first column of the table is the same as the total inbound tourism consumption from Table 1, and the second column is the same as the total domestic private tourism consumption from Table 2. The third column combines the inbound and domestic private tourism consumption, showing the internal tourism consumption within the final consumption expenditure in Denmark. By definition, the consumption by the visitors during their business travels is also tourism consumption, but this expenditure is not private consumption. The domestic business tourism consumption is a part of intermediate consumption. According to the RMF document, the domestic business tourism consumption should be included in TSA Table 4; therefore this information is put at column 4. The last column shows the total tourism consumption in Denmark. It shows that the tourism specific products accounted for 49% and non-specific tourism products accounted for 51% of total tourism consumption.

TSA table 4 provides data on tourism consumption which can be directly entered into TSA table 6 where tourism product supply and consumption can be compared.

TSA table 5 (Table 6.4) is the production accounts of tourism industries and other industries. It shows the relationships between the tourism industries and the products (both tourism specific and non-specific products). The columns are tourism industries, from hotels and other accommodation sectors to recreation and cultural activities; then the total tourism industries, tourism connected, non-tourism industries and the last column is the total output by product. The rows are products divided by three blocks. The first block is the tourism specific products; the second block is the non-specific tourism products; and the third block is the total production output and the relationships between the intermediate consumption and the gross value added of production activities.

The last row of the first block shows the total tourism specific products produced by each sector, for example, hotels and other accommodation sectors produce 7 565 million DKK of hotel service, 1 486 million DKK of other accommodation services and 700 million DKK of restaurant services. In total, the hotel and other accommodation sector produce 9 751 million DKK of tourism specific products.

Table 6.3 TSA Table 4 – Internal tourism consumption in 2000, by products and types of tourism (in million DKK, current price)

| Tourism specific products: | Inbound tourism consumption | Domestic tourism consumption | Internal tourism consumption | Danish business visitors | Total tourism consumption |
|---|---|---|---|---|---|
| Hotels | 1 653 | 564 | 2 216 | 2 149 | 4 366 |
| Other accommodation | 457 | 873 | 1 330 | 0 | 1 330 |
| Restaurants and other caterings | 3 927 | 1 696 | 5 623 | 453 | 6 076 |
| Local transport (subway, bus and taxi) | 709 | 613 | 1 322 | 28 | 1 350 |
| Long distance transport (railway, water and air) | 1 528 | 1 115 | 2 643 | 476 | 3 118 |
| Travel agency and transport services | 1 064 | 943 | 2 008 | 577 | 2 584 |
| Holiday cottage and car rental | 2 632 | 437 | 3 069 | 228 | 3 297 |
| Cultural and recreational services | 540 | 393 | 934 | 19 | 953 |
| *Tourism specific products, sub-total:* | *12 511* | *6 634* | *19 145* | *3 930* | *23 075* |
| **Non-specific tourism products:** | | | | | |
| Petroleum | 2 894 | 836 | 3 729 | 256 | 3 985 |
| Food, drinks and tobacco | 5 575 | 3 738 | 9 314 | 107 | 9 420 |
| Clothes and footwear | 2 214 | 940 | 3 154 | 100 | 3 254 |
| Consumer's electronics | 181 | 164 | 345 | 5 | 349 |
| Jewellery and watches | 361 | 572 | 932 | 2 | 935 |
| Other services | 4 503 | 1 802 | 6 305 | 79 | 6 384 |
| *Non-specific tourism products, sub-total:* | *15 728* | *8 051* | *23 779* | *548* | *24 328* |
| **Tourism consumption, total:** | **28 239** | **14 685** | **42 924** | **4 478** | **47 402** |

Source: own calculation is taken on the basis of the data sources from Statistics Denmark and VisitDenmark.

Table 6.4 TSA Table 5 – Production accounts of tourism industries and other industries, in 2000 (in million DKK, current price)

| Industries | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | Total tourism | Tourism connected | Non-tourism industry | Total output of domestic production |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Tourism specific products** | | | | | | | | | | | | |
| Hotels | 7 565 | | | | | | | | 7 565 | | | 7 565 |
| Other accommodation | 1 486 | | | | | | | | 1 486 | | | 1.486 |
| Restaurants and other caterings | 700 | | 25 886 | | | | | | 26 586 | | | 26 586 |
| Local transport (subway, bus and taxi) | | | | 14 622 | | | | | 14 622 | | | 14 622 |
| Long distance transport (railway, water, air) | | | | | 30 630 | | | | 30 630 | | | 30 630 |
| Travel agency and transport services | | | | | | 10 156 | | | 10 156 | | | 10 156 |
| Holiday cottage and car rental | | 1 771 | | | | | 2 117 | | 3 888 | | | 3 888 |
| Cultural and recreational services | | | | | | | | 9 976 | 9 976 | | | 9 976 |
| **Tourism specific products, total** | 9 751 | 1 771 | 25 886 | 14 622 | 30 630 | 10 156 | 2 117 | 9 976 | 104 909 | | | 104 909 |
| **Non-specific tourism products** | | | | | | | | | | | | |
| Agricultural products | | | | | | | | | 0 | 0 | 70 589 | 70 589 |
| Petroleum | | | | | | | | | 0 | 383 | 54 724 | 55 107 |
| Food, drinks and tobacco | | | | | | | | | 0 | 0 | 114 989 | 114 989 |
| Clothes and footwear | | | | | | | | | 0 | 0 | 15 346 | 15 346 |
| Consumer's electronics | | | | | | | | | 0 | 0 | 38 975 | 38 975 |
| Jewellery and watches | | | | | | | | | 0 | 0 | 4 648 | 4 648 |
| Other manufacturing | | | | | | | | | 0 | 0 | 314 331 | 314 331 |
| Housing and energy | | | | | | | | | 0 | 0 | 39 250 | 39 250 |
| Construction | | | | | | | | | | 0 | 146 192 | 146 192 |
| Business and private services | | 4 994 | | | | | 7 887 | 24 111 | 36 992 | 67 613 | 271 786 | 339 399 |
| Public services | | | | | | 2 | | 50 | 53 | 54 | 357 729 | 357 783 |
| Other services | 31 | 42 | 3 935 | 9 | 89 905 | 20 944 | 51 | 204 | 115 121 | 137 934 | 230 873 | 368 807 |
| Domestic retailing and wholesaling margins | | | | | | | | | | | 220 287 | 220 287 |
| **Non-specific tourism products, total** | 31 | 5 036 | 3 935 | 9 | 89 905 | 20 946 | 7 938 | 24 365 | 152 165 | 205 983 | 1 879 719 | 2 085 702 |
| Total output at basic price | **9 782** | **6 807** | **29 821** | **14 631** | **120 535** | **31 102** | **10 055** | **34 341** | **257 074** | **32 830** | **1 900 706** | **2 190.611** |
| Total intermediate consumption | 5 121 | 3 971 | 15 166 | 7 745 | 93 728 | 13 832 | 5 623 | 14 007 | 159 193 | 17 407 | 921 929 | 1 098 529 |
| Total gross value added of activities | 4 662 | 2 836 | 14 655 | 6 886 | 26 807 | 17 270 | 4 432 | 20 334 | 97 881 | 15 424 | 978 777 | 1 092 082 |
| Compensation of employees | 3 006 | 2 225 | 7 356 | 5 820 | 12 645 | 9 099 | 1 388 | 11 303 | 52 872 | 8 202 | 619 297 | 630 371 |
| Other taxes less subsidies on production | -12 | 364 | -35 | -1 197 | -317 | 25 | -5 | -787 | -1 964 | 46 | 4 525 | 2 607 |
| Gross mixed income | | | | | | | | | | | | |
| Gross operating surplus | 1 668 | 216 | 7 333 | 2 263 | 14 479 | 8 146 | 3 050 | 9 818 | 46 973 | 7 176 | 358 765 | 412 913 |
| Share of tourism specific products by Industry (%) | 99.68 | 26.02 | 86.81 | 99.94 | 25.41 | 32.65 | 21.05 | 29.05 | | | | 4,79% |

Note: T1– hotels and similar; T2 – second home; T3 – restaurants and caterings; T4 – local transport service; T5 – long distance transport; T6 – travel agency and other transport services; T7 – transport equipment rental; T8 – recreational, cultural and sport activities.

The last row of the second block shows the total non-specific tourism products. The tourism industries also produce some non-specific tourism products, such as general service and other transport services. The non-specific tourism products are mainly produced by the non-tourism industries.

In the third block, the total production output is obtained by adding up the tourism specific products with the non-specific tourism products at each industry. The third block also gives the information of intermediate consumption and gross value added of production activities by industry. After the row of gross value added of activities, it gives the contents of the gross value added, such as compensation of employees, other production taxes less subsidies on production, and gross operating surplus. These rows show the relationships among the production outputs, intermediate consumption, gross value added and other factors in industries.

The last row of the table 5 shows the shares of tourism products by industry. The shares are calculated by dividing the total tourism specific products by the total output at each industry. It is shown that some tourism industries have higher shares than other industries, such as share in the hotel and other accommodation industry is 99.68%, in restaurant is 86.81, and in local transport is 99.94%. This means that their products are mainly concentrate on the areas that are identified as tourism specific products. It should be clarified that it does not mean that all these products are consumed by tourists. If we want to get information about what is the share of the each product consumed by tourists, we should see TSA table 6 where the tourism ratios on supply is given.

TSA table 6 (Table 6.5) shows both the domestic supply by each aggregated product and the total tourism consumption by product. The purpose of Table 6 is to calculate the tourism ratios on supply. The first column in Table 6 is the output of domestic production at basis prices, the second column is import, the third column is net commodity taxes less subsidies, VAT, and retailing and wholesaling margins by product. When these three columns are added up, it is the market prices for each product, representing the product supply at purchase prices. The total tourism consumption is also in purchase prices. The tourism ratio on supply for each product category, shown in the last column, is calculated by dividing the total tourism consumption by the total supply at purchase prices.

The tourism ratios on supply in Table 6 are quite different for different products. It is shown that the hotels, other accommodation and holiday cottage rental have higher ratios than other TSA products. Travel agency and transport services, restaurant and catering service have relative higher ratios.

TSA Table 7 (Table 6.6) presents the employment in the tourism related industries. The total employment in the sectors that corresponds to tourism consumption is estimated to 148 449 persons. The estimation takes supply shares of the aggregated sectors into account; therefore it shows the direct jobs in the tourism-related industries. The tourism employment accounts for 5.3% of total employment in Denmark. According to the RMF document, the indicator for the size of employment should be the number of jobs and the number of employed persons having at least one job in these tourism industries. The employment presented in this table is the average number of employed persons. The Statistics Denmark national accounts define employment by the term “average number of employed persons”. That is to say a person, who worked during the whole accounting period, is counted as one employment; a person, who worked during the half of the accounting period, is counted as a half employment. By this way the problem of seasonality will be solved. But this employment accounting method will not show how many working hours the persons have been employed. For example, a part-time employed person, if he (or she) worked for the whole accounting period, is counted as one employment. Furthermore, it has the rule of primary employment: a person who has committed himself to more than one employment relation is registered as just one employment within his primarily employed industry.

The RMF suggests a breakdown of the employment according to the gender. TSA table 7 shows the employment by 11 tourism-related industries (rows) and by gender (columns). The last two columns show the share of male workers and female workers in each industry. Only in the hotels and restaurants industries do female employees account for more than half of employment; in the transport industries, as clearly shown, the male employment account for large shares of sectors employment. Female accounted for a little more than half of employment in the recreational, cultural and sport sectors.

Table 6.5 TSA Table 6 – Domestic supply and internal tourism consumption in 2000, by products (in million DKK, current price)

| **Tourism specific products:** | **Domestic production** | **Import** | **Taxes and others** | **Domestic supply** | **Tourism** | **Tourism ratios** |
|---|---|---|---|---|---|---|
| Hotels | 7 565 | | 1 832 | 9 396 | 4 366 | 46.5 |
| Other accommodation | 1 486 | | 346 | 1 832 | 1 330 | 72.6 |
| Restaurants and other caterings | 26 586 | | 5 384 | 31 970 | 6 076 | 19.0 |
| Local transport (subway, bus and taxi) | 14 622 | | -1 827 | 12 795 | 2 002 | 15.7 |
| Long distance transport (railway, water and air) | 30 630 | 1 966 | -4 579 | 28 018 | 2 467 | 8.8 |
| Travel agency and transport services | 10 156 | | 258 | 10 414 | 2 584 | 24.8 |
| Holiday cottage and car rental | 3 888 | | 570 | 4 458 | 2 757 | 61.9 |
| Cultural and recreational services | 9 976 | | 582 | 10 557 | 953 | 9.0 |
| *Tourism specific products, sub-total:* | *104 909* | | *2 565* | *109 440* | *22 535* | *20.6* |
| **Non-specific tourism products:** | | | | | | |
| Agricultural products | 70 589 | | 11 927 | 95 072 | 0 | 0 |
| Petroleum | 55 107 | | 30 014 | 110 956 | 3 985 | 3.6 |
| Food, drinks and tobacco | 114 989 | | 65 110 | 214 404 | 9 420 | 4.4 |
| Clothes and footwear | 15 346 | | 25 025 | 71 730 | 3 254 | 4.5 |
| Consumer's electronics | 38 975 | | 25 050 | 116 584 | 349 | 0.3 |
| Jewellery and watches | 4 648 | | 6 909 | 16 216 | 935 | 5.8 |
| Other manufacturing | 314 331 | | 146 284 | 663 127 | 0 | 0 |
| Housing and energy | 39 250 | | 24 149 | 63 960 | 526 | 0.8 |
| Construction | 146 192 | | 19 419 | 165 610 | 0 | 0 |
| Business and private services | 339 399 | | 20 738 | 366 164 | 6 384 | 1.7 |
| Public services | 357 783 | | 4 692 | 362 474 | 0 | 0 |
| Other services | 368 807 | | 7 317 | 454 917 | 14 | 0 |
| Domestic retailing and wholesaling margins | 220 287 | | 2 937 | 17 970 | 0 | 0 |
| *Non-specific tourism products, sub-total:* | *2 085 702* | | *389 572* | *2 719 183* | *24 867* | *0.9* |
| **Total output** | **2 190 611** | | **392 137** | **2 828 624** | **47 402** | **1.7** |

Table 6.6 TSA Table 7 – Employment in the tourism industries in 2000

| Tourism industry | Male | Female | Total | Share of male | Share of female |
|---|---|---|---|---|---|
| 1. Hotels and similar | 8 364 | 12 268 | 20 632 | 40.5 | 59.5 |
| 2. Second home | 439 | 435 | 874 | 50.2 | 49.8 |
| 3. Restaurants and similar | 24 190 | 30 118 | 54 308 | 44.5 | 55.5 |
| 4. Railway passenger transport | 7 436 | 2 371 | 9 807 | 75.8 | 24.2 |
| 5. Road passenger transport | 10 493 | 2 486 | 12 979 | 80.8 | 19.2 |
| 6. Taxi and other road transport | 11 647 | 1 913 | 13 560 | 85.9 | 14.1 |
| 7. Water passenger transport | 2 368 | 570 | 2 938 | 80.6 | 19.4 |
| 8. Air transport | 6 899 | 4 162 | 11 061 | 62.4 | 37.6 |
| 9. Travel agency | 6 841 | 3 984 | 10 825 | 63.2 | 36.8 |
| 10. Transport equipment rental | 718 | 337 | 1 055 | 68.1 | 31.9 |
| 11. Recreation, cultural and sport | 5 196 | 5 214 | 10 410 | 49.9 | 50.1 |
| **Total employment in the tourism industries** | **84 591** | **63 858** | **148 449** | | |

# 7 Supplement and Recommendation

In the closing section, it is necessary to give some supplementary information and the recommendations for the future researches and work concerning the regional TSA.

## 7.1 Tourism Accounting versus Tourism Modelling

The documentation in this report is only the document for the accounting part of the TSA. However, the tourism satellite accounting is merged into the Danish interregional macroeconomic model. The advantages of combining the accounting and modelling as an integrated system are: a) the system gives automatically regional dimension for the TSA; b) the model has time series for the data both from the national accounts and the tourism survey. This means that the regional TSA for Denmark is not only made for one-year's period as many other countries did, but it shall have a time dimension including forecasting years when the data from the national accounts are not available.

The Danish interregional macroeconomic model, LINE, is applied in this project. The LINE model and the tourism sub-model in the LINE are documented in the other reports from AKF (see Madsen, 2001a, Madsen, 2001b, and Zhang, 2001). The Regional TSA has also applied the tourism survey data and shall conduct the regional tourism economic consequence analysis. The tourism survey data and the method for the consequence analysis are also documented in the AKF report (see Zhang, 2001).

With the modelling solution, the model system can provide us with not only the regional TSA (the accounting part), but also the regional economic analysis (the modelling part), but also the regional economic analysis (the modelling part). In the accounting part, the system will show the TSA tables according to the requirement from the TSA documents. In the modelling part, the system gives information about tourism GDP, tourism incomes, tourism employment, and other governmental revenues related to tourism.

## 7.2 Regional TSA versus National TSA

One of the features in the interregional macroeconomic model is that the model has spatial regional dimensions. The data from the national accounts, such as production, intermediate consumption, private consumption, governmental collective consumption, gross fixed capital formation, import and export, are regionalized. Besides, the tourism survey data are also regional data at a county level. It is possible to make the regional TSA at a county level with this model system, which can also present the national TSA by aggregating all the regional together.

## 7.3 Forecasting Method for TSA

The LINE model applies the Danish national macroeconomic model, ADAM, from Statistics Denmark in the regional economic forecasting. The key economic variables, such as production, income, consumption, import and export, as well as population, labour force and employment follow the same trend as the national economic development.

The forecasting for tourism product development adopts the same method. It is assumed that a tourism product development follows the same trend as the development of the industry that produces this product. For example, the latest data from the national accounts is year 2000 at present, from which we have information of tourism products produced by each industry. We shall forecast the same data for the year 2001-2004, i.e. the tourism products provided by these industries in 2001-2004 is forecasted

by using the corresponding data in 2000 multiplied with the national growth rate from 2000 to 2004 in the same industries.

## 7.4 Recommendation for the Future Researches and TSA Work

There are several tables unavailable in the Danish TSA tables in according with the requirements from the TSA documents. Some special efforts that have to be made in the future work on the Danish TSA are addressed here.

### 7.4.1 Tourism Consumption from Danish Same-day Visitors

The tourism consumption from the Danish same-day visitors is a part of domestic tourism consumption which is shown in the TSA Table 2. It is not available at present due to lack of data. However, the process of collecting the relevant data has already started in 2004 by both Statistics Denmark and VisitDenmark. The tourism consumption from Danish same-day visitors is expected to be included into the system in 2005.

### 7.4.2 Outbound Tourism

Due to the same reason, the tourism consumption for the Danish outbound tourism is not available at present. The development for the outbound tourism required at least two steps: a) to collect the data; b) to put the data into the model system and to make the modelling.

Data collection involves both Statistics Denmark and VisitDenmark. The data cover both the numbers of nights (trips) and their daily consumption for Danish residents going out of country for travelling. The data should also include the information about the purpose of the trips, such as business or private; in which country the travel has been made; which kinds of accommodation the Danish tourists (businessmen) have stayed and how much did they spend in total and in the separate consumption groups.

The inbound tourism consumption in Denmark is treated as export in the modelling solution. The outbound tourism consumption is seen as the Danish import. Therefore, tourism economic consequences will be shown

in the modelling from both the inbound and the outbound tourism. This raises a question about the effects on the destination competition between the Denmark and the other countries.

### 7.4.3 Domestic Business Tourism

The foreign business tourism consumption in Denmark is treated as export in the modelling; however, this consumption is also a part of private consumption, as foreign tourists, whichever, for the business or private purpose, they consumed products and services in Denmark as a part of final demand. On the other hand, domestic business tourism consumption is not a part of private consumption. This is because most of consumption for the business trip is financed by their companies and institutions. For example, most of the companies and the institutions pay for their employees business travelling expenses including hotel, restaurant and transport. The travellers may also have some other expenses, such as on clothes, souvenir, and recreation activities on their own budget. The consumption paid by the companies and the institutions actually is a part of intermediate consumption in the national accounts. The spending they paid themselves should be included in the private consumption.

In the TSA tables, the domestic business tourism consumption should be presented as the final consumption. In the modelling the intermediate consumption part of this consumption should be treated as the inputs to the production. The consequence of reducing (or increasing) intermediate consumption on hotels on the economies and employment should be further investigated.

Therefore, both the accounting part and the modelling part need more researches and work in the future TSA project.

### 7.4.4 Tourism Collective Consumption and Fixed Capital Formation

According to the TSA documents, the TSA tables should include the tourism-collective consumption and the fixed capital formation of the tourism sectors. There is some information in the national accounts of the collective consumption on some tourism products. But these data are far from

enough to compile the TSA table. If this table should be compiled, some surveys have to be made for the purpose.

The foreign business tourism consumption in Denmark is treated as export in the modelling; however, this consumption is also a part of private consumption, as foreign tourists, whichever, for the business or private purpose, they consumed products and services in Denmark as a part of final demand.

The fixed capital formation in the tourism sectors is not available in Statistics Denmark's national accounts. The data of the national gross capital formation in the national accounts are presented by groups of capital formation components, such as machines and equipments, transport, housing, etc. The data are not available by the industries; therefore, the TSA table for the fixed capital formation is impossible to compile.

### 7.4.5 Closing Words

To conclude the Danish regional TSA project, we find some advantages in applying the Danish regional model to construct tourism satellite account. The methods for developing the Danish TSA follow the official documents and recommendations from the Eurostat, OECD, WTO and the UN statistics division. The TSA accounting part is merged into the regional model that ensures the consistency with the national accounts and the regional production accounts. Another advantage is that the Danish regional TSA has time series, and by using the national macroeconomic model, ADAM, it is possible to forecast the regional TSA to the present year. The model is used by the Danish Tourism Board for making the tourism regional economic analysis.

Several aspects in the TSA work have to be improved in the future work. Apart from what have been mentioned in the above recommendations, there are still rooms for the TSA improvement. For example, the private consumption in hotel and in some forms of transport, for example, air transport in the national accounts seems to be lower than the data from the tourism survey. Some information is still unavailable from the tourism survey, such as the tourism consumption in car rental and in use of tourism bureaus; the domestic tourists (or visitors) use of private car for the

tourism purposes. The future work still requires the co-operation among the Denmark Statistics, the Danish Tourism Board and akf.

# Appendix

Table A1.1 Identifying tourism specific products from the national accounts

| CPA | Code in NRNR | Tourism products in English | Turistsvares navn på dansk |
|---|---|---|---|
| 55.11.10 | 551110 | Hotels with restaurants | Hoteller med restauration |
| 55.11.20 | 551120 | Conference centre | Konferencecentre og kursusejendomme |
| 55.12.00 | 551200 | Hotels without restaurants | Hoteller uden restauration |
| 55.21.00 | 552100 | Youth hostels | Vandrehjem |
| 55.22.00 | 552200 | Camping sites | Campingpladser |
| 55.23.10 | 552310 | Holiday centres | Feriecentre |
| 55.23.90 | 552390 | Other short stay accommodation | Andre faciliteter til korttidsophold |
| 55.30.00 | 553000 | Restaurants | Restaurationsvirksomhed |
| 55.40.00 | 554000 | Disco and night clubs | Værtshuse, diskoteker, m.v. |
| 55.51.00 | 555100 | Canteen | Kantiner |
| 55.52.00 | 555200 | Catering and transportable catering service | Catering, diner transportable |
| 60.10.02 | 601002 | Railway, passenger transport | Jernbaner, passagertransport |
| 60.20.00 | 602000 | Subway train | S-tog |
| 60.21.00 | 602100 | Bus and other route transport | Bustrafik m.v. rutefart |
| 60.22.00 | 602200 | Taxi | Taxikørsel |
| 60.23.00 | 602300 | Other land passenger transport | Anden landpassagertransport |
| 61.10.20 | 611020 | Ferry and other water passenger transport | Rederivirksomhed, passagerfart |
| 61.20.00 | 612000 | Water transport, inland | Transport ad indre vandveje |
| 62.10.00 | 621000 | Route air transport | Ruteflyvning |
| 62.20.00 | 622000 | Charter and taxi air transport | Charter/taxiflyvning |
| 63.21.30 | 632130 | Toll for highways, bridges and tunnels | Betalingsvej, - bro og tunnel |
| 63.22.20 | 632220 | Yacht harbour | Lystbådehavne |
| 63.30.10 | 633010 | Tourist bureau | Turistbureauer |
| 63.30.20 | 633020 | Travel agency, tour operator | Rejsebureauer, tur arrangerende |
| 63.30.30 | 633030 | Travel agency, ticket booking | Rejsebureauer, billetudstedende |
| 70.31.30 | 703130 | Holiday cottage rental | Ferieboligudlejning |
| 71.10.00 | 711000 | Car rental | Personbiludlejning |
| 74.84.40 | 748440 | Congress fair and exhibition activities | Kongres-, messe- og udstillingsaktiviteter |
| 92.33.00 | 923300 | Amusement parks | Forlystelsesparker |
| 92.52.00 | 925200 | Museum | Museer |
| 92.53.00 | 925300 | Botanical garden and zoo | Botaniske og zoologiske haver |
| 92.61.00 | 926100 | Sport facilities | Idrætsanlæg, markedsmæssigt |

Note: * code 553009 is used for the general aggregation category for restaurant.

Table A1.2 Tourism industries with NACE and DB93 codes

| NACE | DB93 | Tourism industry (branches) in English | Turismeerhverv på dansk |
|---|---|---|---|
| 55.11 | 551110 | Hotels with restaurants | Hoteller med restauration |
| 55.11 | 551120 | Conference centre | Konferencecentre og kursusejendomme |
| 55.12 | 551200 | Hotels without restaurants | Hoteller uden restauration |
| 55.21 | 552100 | Youth hostels | Vandrerhjem |
| 55.22 | 552200 | Camping sites | Campingpladser |
| 55.23 | 552310 | Holiday centres | Feriecentre |
| 55.23 | 552390 | Other short stay accommodation | Andre faciliteter til korttidsophold |
| 55.30 | 553000 | Restaurants | Restaurationsvirksomhed |
| 55.40 | 554000 | Disco and night clubs | Værtshuse, diskoteker, m.v. |
| 55.51 | 555100 | Canteen | Kantiner |
| 55.52 | 555200 | Catering and transportable catering service | Catering, diner transportable |
| 60.10 | 601000 | Railway | Jernbaner |
| 60.21 | 602000 | Bus, subway train and other route transport | Bus- og S-togstrafik, rutefart |
| 60.22 | 602200 | Taxi | Taxikørsel |
| 60.23 | 602300 | Other land passenger transport | Anden landpassagertransport |
| 61.10 | 611020 | Ferry and other water passenger transport | Rederivirksomhed, færge- og passagerfart |
| 61.20 | 612000 | Water transport, inland | Transport ad indre vandveje |
| 62.10 | 621000 | Route air transport | Ruteflyvning |
| 62.20 | 622000 | Charter and taxi air transport | Charter/taxiflyvning |
| 63.21 | 632130 | Toll for highways, bridges and tunnels | Betalingsvej, - bro og tunnel |
| 63.22 | 632220 | Yacht harbour | Lystbådehavne |
| 63.30 | 633010 | Tourist bureau | Turistbureauer |
| 63.30 | 633020 | Travel agency, tour operator | Rejsebureauer, tur arrangerende |
| 63.30 | 633030 | Travel agency, ticket booking | Rejsebureauer, billetudstedende |
| 63.30 | 633040 | Tourist guide business | Turistguidevirksomhed |
| 70.31 | 703130 | Holiday cottage rental | Ferieboligudlejning |
| 71.10 | 711000 | Car rental | Personbiludlejning |
| 74.84 | 748440 | Congress fair and exhibition activities | Kongres-, messe- og udstillingsaktiviteter |
| 92.33 | 923300 | Amusement parks | Forlystelsesparker |
| 92.52 | 925200 | Museum | Museer |
| 92.53 | 925300 | Botanical garden and zoo | Botaniske og zoologiske haver |
| 92.61 | 926100 | Sport facilities | Idræts – og svømmehaller |

Note: * NACE is Nomenclature of activity of European Communities. * DB93 is the Danish Branch code from 1993.

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# Sammenfatning

## Dokumentation for regionale turistsatellitregnskaber i Danmark

*Jie Zhang, marts 2005*

Denne sammenfatning er dokumentation for regionale turistsatellitregnskaber (RTSA) i Danmark. RTSA-projektet indgår som led i turismeprojektet mellem akf, amternes og kommunernes forskningsinstitut, og VisitDenmark. Siden 1996, hvor samarbejdet mellem akf og VisitDenmark startede, har målet med turismeprojektet været at indsamle oplysninger om turismeefterspørgslen på grundlag af undersøgelsesmetoden og at lave økonomiske analyser af den regionale turisme ved hjælp af en interregional makroøkonomisk model. De to parter har i fællesskab besluttet, at turismeregnskabsmetoden skal udvikles yderligere, så det sikres, at turismestatistikken indsamles i overensstemmelse med den internationale standard. Et turistsatellitregnskab (TSA) er en international standardmetode til indsamling af turismestatistik. OECDs statistiske udvalg, Eurostat, World Tourism Organisation (WTO) og FNs statistiske afdeling har anbefalet alle medlemslandene at benytte TSA.

Formålet med regionale turistsatellitregnskaber er at udarbejde regionale TSA-tabeller og måle turismebidraget til regionaløkonomien. TSA-tabellerne bør være i overensstemmelse med nationalregnskabet, og de bør kunne sammenlignes med TSA-tabeller fra andre lande og tabeller fra andre erhverv. Turistsatellitregnskaberne skal sikre, at turismestatistikken er

troværdig, konsekvent, pålidelig og sammenlignelig og kan fungere som analyseværktøj for regionale turismeundersøgelser.

Dokumentationen indeholder seks afsnit. Afsnit 1 indeholder en introduktion. Afsnit 2 indeholder formål og retningslinjer for TSA. Afsnit 3 giver definitioner på turismerelaterede udtryk. Detaljerede definitioner af udtrykkene turist og turisme, turismeefterspørgsel, turismeprodukter og turismeerhverv findes i officielle TSA-dokumenter. Dette afsnit indeholder en oversigt over definitionerne for at fastlægge betydningen af udtrykkene turisme, turismeefterspørgsel og turismeindustrier, som anvendes i danske turismesatellitregnskaber. Det er vigtigt at definere disse udtryk, da de ikke benyttes hverken som traditionelle økonomiske termer eller i nationalregnskabet. Appendix indeholder en liste over turismeprodukter og turismeerhverv, der er defineret i dansk TSA-sammenhæng. I afsnit 4 beskrives datakravene til den regionale model og de TSA-tabeller, der kræves af Eurostat, OECD, WTO og FN. De metodikker, der er brugt i forbindelse med udviklingen af de danske regionale turismesatellitregnskaber, præsenteres i afsnit 5. I afsnit 5.2 beskrives en mere generel procedure for udarbejdelse af regionale turismesatellitregnskaber, og de detaljerede beregningsmetoder præsenteres i afsnit 5.3. I afsnit 6 præsenteres og forklares resultaterne af TSA-tabellerne. De seks TSA-tabeller vises i dette afsnit. Sidste afsnit indeholder supplerende oplysninger og anbefalinger.

Hovedparten af denne rapport er helliget metodikdokumentation for udvikling af danske RTSA. Rapporten indeholder dokumentation for datakilder og -metoder til indsamling af TSA-statistik. TSA-statistik består af to hovedelementer: turismeudbud og turismeefterspørgsel. Turismeudbuddet viser de turismeprodukter, der produceres af de turismerelaterede erhverv. Det er nødvendigt at måle turismeudbuddet både i basispriser og i markedspriser, og det er nødvendigt med nogle metodikker for at beregne turismeudbuddet i markedspriser.

Beregningerne af turismeefterspørgslen er mere komplicerede end beregningerne af turismeudbuddet. De vigtigste datakilder til beregning af turismeefterspørgslen er turismeundersøgelsesdata. De danske turismeundersøgelsesdata er ikke direkte kompatible med TSA-tabelkravene, og de er heller ikke i overensstemmelse med nationalregnskabet. Derfor er det nødvendigt med nogle metoder til at beregne turismeefterspørgslen mere præcist. For det første skal forbrugskomponenterne i turismeundersøgelsesda-

taene omdannes til de forbrugskomponenter i modellen, der er de samme som i nationalregnskabet. For det andet skal komponenterne omdannes til de produktkategorier, der svarer til den internationale standard for TSA-produkterne. For det tredje benyttes der en ny metode i den danske TSA-udvikling, dvs. at vi kombinerer turismeundersøgelsesdataene og turisme-udbudsdataene for at beregne turismeefterspørgslen i form af TSA-produkterne. Dette skyldes, at der mangler nogle produktkategorier i turismeundersøgelsesdataene, hvilket igen betyder, at der mangler nogle oplysninger til udarbejdelsen af TSA-tabellerne. Derfor er turismeefterspørgselsberegningen baseret på tre kilder: turismeundersøgelsesdata, de nationale forbrugstabeller og de nationale udbudstabeller.

Som afslutning på det danske regionale TSA-projekt kan vi sige, at fordelene ved dette arbejde efter vores mening er følgende:

a. Det er udført i overensstemmelse med de officielle dokumenter og anbefalinger.
b. Det forener TSA-regnskabsdelen med opstilling af modeller, og begge dele er baseret på nationalregnskabet. De danske turismesatellitregnskaber er i overensstemmelse med det danske nationalregnskab.
c. Det indeholder tidsserier samt mulighed for at udarbejde prognoser for TSA-tabeller til indeværende år.
d. Der er tale om regionale turismesatellitregnskaber, så derfor kan de lettere anvendes til økonomiske analyser af regional turisme.

Der er flere aspekter ved TSA-arbejdet, der skal forbedres i forbindelse med det fremtidige arbejde. Ud over det, der er nævnt i sidste afsnit om danske endagsturister, udgående turisme og indenlandsk forretningsturisme, er der stadig plads til forbedring af TSA. For eksempel kan det nævnes, at privatforbruget på hoteller og i forbindelse med nogle former for transport, fx lufttransport, lader til at være lavere i nationalregnskabet end i turismeundersøgelsens data. Nogle oplysninger fra turismeundersøgelsen er stadig ikke tilgængelige, fx turismeforbruget i forbindelse med biludlejning og brug af turistbureauer og indenlandske turisters (eller besøgendes) brug af privatbiler til turismeformål. Samarbejdet mellem Danmarks Statistik, VisitDenmark og akf er fortsat nødvendigt i det fremtidige arbejde.