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## Conference Paper

# Regional Impacts of Tourism in Norway: Regional Satellite Accounting for Tourism as a basis for Regional Input-Output Modelling

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# Regional Satellite Accounts for Tourism Data, Concepts, Methods and Applications

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## **Abstract**

Economic Accounting is relatively well developed in Norway especially on the national level, but also on the regional level. Satellite accounting is used for focusing certain features of the economy, a.o. for tourism. A satellite account for tourism has been developed on the national level. Because the tourists' activities are regional activities, and because the impacts of tourism are significant not only on the national, but also on the regional level, a regional satellite account for tourism was developed by us during the past two years. Such satellite accounts on the regional level are, to our knowledge, not developed worldwide. The data can a.o. be used for moderating existing input-output models, so they can become more tailor-made for analysing impacts of tourists' economic activities. We propose a paper that focuses on our work

- methods for regionalising satellite accounts for tourism,
- indicators applied for this regionalisation,
- how regional satellite account figures can be adapted into existing input-output models of the Norwegian economy (on the regional level), and
- an example, showing how the regional satellite accounts for tourism can be used for simulating the regional impacts of tourism by the use of input-output techniques.

# 1 Introduction

The Norwegian Research Council, which is the main body for financing research in Norway, a couple of years ago initiated a research programme on travel and tourism. This programme was a follow-up of earlier research programmes on tourism. Some of the main aims of the new programme were to develop information (data) on tourism, and to develop (simulation) models that can be applied when calculating the impacts of tourism.

Norwegian Institute for Urban and Regional Research, Statistics Norway and the Institute for Transport Economics applied for a project combining these two aims. The project focuses on three main issues:

1. Developing regionalised tourism satellite accounts (RTSA) for Norway,
2. developing data that can be adapted for constructing the RTSA, and
3. developing a simplified input-output model for analysing the impacts of tourism on the regional level.

Issues one and two focus on providing better data/information, while issue three is focused on developing a model that can be used for simulating impacts of (changing) tourism on the regional level.

Generally, the National Accounts System is relatively well developed in Norway. We already have a Regional National Accounts System, where figures from the National Accounts are regionalised and consistent with the national figures. In addition, a national Tourism Satellite Accounting system (TSA) exists. One important condition when developing the RTSA was to secure consistency between the TSA, the Regional National Accounts and the RTSA. This is discussed in some detail in chapter 2 and 3. Chapter 3 also includes a discussion of the indicators applied for distributing TSA data regionally, as well as a presentation of some of the major figures in the RTSA. In chapter 4, a simplified input-output system for Hordaland county is used to simulate the impacts for production of increasing tourist consumption by 10 per cent (NOK 500 million). We find secondary impacts of around NOK 200 million, or a production multiplier of 1.4. Chapter 5 concludes the paper, discussing some future perspectives on RTSA and modelling tourism in Norway.

## 2 Regional satellite accounts for tourism

### 2.1 The National Accounts and tourism

The national accounts is a system designed to give a consistent and comprehensive picture of the national economy. There is international agreement on the basics of this system as described in SNA93. For our Norwegian economy there is a further specification known as ESA95 (Eurostat 1996). This accounting system should cover in an aggregate way all transactions of the economy. The transactions are grouped according to the nature of the products involved (e.g. hotel accommodation) and according to the purpose of the transactions (e.g. household consumption). The parties doing the transaction are grouped according to institutional sector (e.g. a non-financial corporation selling to a household), and the functional units are grouped according to industry. The results of the transactions are described in terms of income flows and stocks of economic assets. For all these classifications there are harmonised classifications with minimum requirements as to the details, at least

applicable to the European Economic Area. All nations have to provide National Accounts if they want to be members of the UN.

Tourism is of course a part of the economy and as such covered by the National Accounts System. If more information on tourism is wanted, why do we need Tourism Satellite Accounts (TSA)? There seems to be one main answer to this question, and some more additional points whose importance varies with national circumstances.

The main reason why we need TSA in addition to the regular National accounts, is that the regular National Accounts do not identify a 'tourist' in the classification of economic units/agents. Correspondingly, we do not find 'tourism' as a well defined purpose in the classification of transactions, even though some of the purposes are clearly relevant for tourists. In Norway, much of the TSA activities are concerned with the estimation of 'tourism consumption', loosely defined as the domestic expenditure of tourists (including business travellers and foreign tourists). All these expenditures are included in the regular National Accounts, but there they are not specifically related to tourists or tourism.

Another point is the interest in 'tourism industries', that is the industries supplying the goods and services for tourism consumption. The regular classification of production units into industries tries to define groups of units supplying similar or homogenous products. The 'tourism industry' is typically a mix of very different activities, such as restaurants, transportation etc. Of course a 'tourism industry' may be defined in terms of the regular industries as defined in the ISIC/ NACE classifications, provided sufficient detail is available. Our work in the TSA field has led to modifications in the classification of industries used in the regular accounts. A relevant example is splitting 'ocean transport' into passenger transport and other ocean transport.

In the TSA, we have defined 'tourism products' as products typically used for tourist consumption. These products are regular products in the supply and use tables of the National Accounts. Specifying tourism industries and tourism products is a way to collect the most relevant detailed information in the National Accounts. Some of this information is published in this TSA context only, although directly retrievable from the National Accounts databases.

Even though the National Accounts cover all transactions, all transactions are not covered equally well. Setting up the TSA also directs more attention to the relevant details of the regular National Accounts, and often further data are required, data that also can strengthen the regular accounts. For the Norwegian National Accounts, the focus on tourism has added quality and detail in the treatment of some tourism industries and relevant products.

## **2.2 Tourism Satellite Accounts**

The Norwegian Tourism Satellite Accounts are based on the (old) OECD guidelines (OECD(1991)). Central to the accounts is the definition of a tourist.

In the WTO recommendations, travellers are conceptually classified into *visitors* and other travellers. Visitors are persons travelling to and staying in places outside their usual environment – for not more than one consecutive year. The purpose of the travel may be leisure, business or other purposes. Overnight visitors are called tourists. Visitors not staying overnight will be referred to as day tourists, and are also included as tourists.

From the definition of a tourist, we define the tourist consumption as the expenditures of the tourists. Some of these expenditures are for products mainly used by tourists, such as hotel accommodation, air trips etc. These products are characteristic tourism products, and the industries supplying them are the tourism industries. Of course the tourists also use other products. The tourism industries also supply products for non-tourists. A typical example is restaurants, supplying their services to travellers and local people.

The tourist consumption is a domestic concept, adding domestic expenditures for residents and foreign visitors, but excluding expenditures abroad from residents.

Tourist consumption is made up of expenditures of several categories of the regular National Accounts. This is the case for expenditures for business travellers, recorded as intermediate expenditures (for their employers) and expenditure of foreign (non-resident) tourists, recorded as exports of services. For these expenditures the function of the Satellite accounts is not to redefine the concepts used for National Accounts, but rather to extract the relevant data from their place in the accounts so that they can be presented under a unifying heading.

Often, Satellite Accounts use other types of information besides the values of transactions that can be found in the National Accounts. In case of the tourism accounts, special interest is given to the numbers and nationalities of the tourist and the number of guest-nights used in various parts of the accommodation industries (hotels, camping sites ...).

### **2.3 Regional Tourism Satellite Accounts (RTSA)**

The manuals for tourism satellite accounts do not give much guidance for regional breakdowns of the accounts. For regionalising the activities of the tourism industries, we have used the Regional Accounts, for which there are manuals published by Eurostat (Eurostat, 1995). For the regional tourism consumption, we have tried to combine the National Accounts principles with the definitions of tourism consumption. To extend the Regional Accounts, each county has been regarded as a 'small nation' to which basic National Accounts and TSA principles have been applied. Tourism consumption has been defined according to the 'domestic' concept, that is the consumption taking place in the territory of the 'small nations'. Residents of other regions are then formally 'non-residents', so that for instance their food consumption should be counted as tourism consumption, while the national TSA of Norway disregard this consumption. In the end, however, all residents in Norway are grouped together, so that the accounts give a regional distribution of the national figures. Total tourism consumption of food and clothes is, however, a bit higher than in the regular TSA.

The demand for Regional Tourism Satellite Accounts (RTSA) in Norway has two main sources. One is the need for regional statistics in the study and planning of tourism. The other source, as we see it, is the need for consistency and increased realism in analyses of tourism and the related business potential.

The RTSA as such is not a source of primary statistics. The statistics has to be there in order to compile the accounts. There is, however, also the question of using the existing data in an efficient way. In particular we have made use of the existing Regional Accounts and their results for tourism industries (and other industries). Our aim has been to use the existing data sets (and the special data collection organised within the project) in a consistent and efficient way. With better basic statistics, the quality of our accounts could have been better. We think, however, that the results are useful.

Many local analysis of tourism have been too optimistic of the employment and profit possibilities of tourism projects. Our RTSA can give the practitioners a basic framework for local analysts, allowing for a better statistical background for their own data collection and model applications. Finally, the data are used as the data base for the regional models described later in the paper.

### **3. Regional satellite accounts for tourism (RTSA).**

The data situation is in general satisfactory in Norway. The regionalised national accounts exist, and TSA on the national level has also been developed (3.0). Some major figures from the TSA are presented in part 3.0.

The challenge is to regionalise the national TSA, and to secure that the new regionalised TSA is consistent with the national TSA as well as with the regionalised national accounts. In order to achieve these consistencies, additional data sources had to be developed. We therefore take a closer look at how these sources of information have been used and how new information has been added in order to give satisfactory coefficients for a regional distribution of the national satellite accounts (3.1). In section 3.2, we present some of the main figures from the resulting RTSA.

#### **3.0 TSA**

Statistics Norway, Division for National Accounts, is responsible for compiling satellite accounts for tourism in Norway. Tourism satellite accounts (TSA) for the years 1988 - 1997 have been published, as well as preliminary figures for 1998 and 1999. The RTSA has been compiled for 1997, as much of the data for tourism consumption is weaker for earlier period. *National* figures for 1997 are shown in table 1.

The TSA supply-and-use tables focus on the tourism demand and the tourism supply side. Tourism demand covers resident and non-resident tourist's consumption expenditures in Norway. In 1997, non-residents consumed approximately 30.5 per cent of the total tourism consumption. The tourism consumption of resident households is 49.6 per cent of the total. The remaining 19.9 per cent was related to resident industries' business travel expenditures (intermediate consumption). Final consumption by non-residents represented approximately 4.2 per cent of total exports in 1997 (approximately 6.7 per cent excluding exports of crude oil and natural gas).

Table 1 also shows which products enter into tourism consumption, and from where these products are supplied (domestic production by industry, imports). Based on this supply pattern, we have defined a group of specialised tourism industries in the TSA. These industries are hotels and restaurants, most passenger transportation and some other industries. The tourism industries produce 72.5 per cent of the total tourism consumption. Value added in the tourism industries is 4.5 per cent of the total Gross Value Added (GVA), and the industries represents a somewhat larger share of persons employed, 6.7 per cent.

*Table 1. Tourism consumption expenditures at market prices. Non-residents' tourism consumption (F), resident households tourism consumption (H) and resident industries' expenditures on business travel in Norway<sup>1</sup> (B). Million NOK 1997.*

	F	H	B	Total
Characteristic tourism products:				
Accommodation services	3560	2503	2426	8489
Food and beverage serving services	3287	3866	1188	8341
Passenger transport services	4294	6338	8752	19384
Package tours and car rental services *)	80	7552	0	7632
Museum, sporting activities etc.	467	975	0	1442
Total tourism consumption of tourism products	11688	21234	12366	45288
Other products				
Food, beverages and tobacco	2968	0	0	2968
Clothing and footwear	702	0	0	702
Souvenirs, maps etc.	583	275	0	858
Other transportation costs	1755	4229	0	5984
Of this: petrol and oil	1630	3873	0	5503
Other commodities and services	1373	5275	0	6648
Total tourism consumption of other products	7381	9779	0	17160
Total consumption expenditures	19069	31013	12366	62448

\*) Gross recording of package tours

### **Regional Tourism Satellite Accounts (RTSA)**

Our regional accounts may be used to study tourism (and other) industries. They also give information on the products produced and used for intermediate consumption. The regional accounts are weaker on the regional distribution of household consumption, and presently provide no information on the share consumed by tourists. In the following we will describe how the different sources have been used to regionalise the TSA. The presentation is divided in two, first the supply side and then the consumption side.

### **Output in the tourism industries.**

We have linked the production routines from the regionalised national accounts to the RTSA, which means that we have used distribution keys to allocate the output in the tourism industries to the 19 regions.

One of the major advantages of linking the RTSA to the existing regional accounts is that production of the RTSA can be linked to existing routines of data production. These routines will most likely also be continued in the future. This implies that the satellites can be produced more or less alongside the ordinary national accounts statistics. The disadvantage is mainly the long production period. Also, we need to work with the regional indicators that are used for distributing the national accounts figures by region. These were established without having our use of the results in mind. Although the compilation of the regional accounts is done at full national accounts level (175 industries, ca. 1000 products), the product

<sup>1</sup> Notice that "resident industries total expenditures on buissness travel" by definition is different from "the total expenditures of individuals travelling mainly on expense of privat or public domestic establishments". This is the case because a person who travels for business purposes may buy services and/or goods on her trip which are not paid by her employer, but by her own household.

information is generally treated in a summary way. Normally, the same regional indicator is used for distributing all the products of an industry. The RTSA will offer a possibility to review the regional distributions, entering more information on the product level as well. This has for instance proved possible for the hotels.

In the regional accounts, the main principle is that the activity is located at the region of residence of the Local Kind of Activity Units (LKAU). This is a principle that works well for most of the non-transport tourism industries. In Norway, the data is generally produced for the LKAUs. Some transportation industries, such as air and railroad transport, the regional distribution of production is calculated by using regional activity indicators such as the number of passengers that enters or exit on stops in the region. This also works well for our purpose, although some industries, especially tour operators and sea passenger transport, would need a closer look. In most cases the region of production of the tourism services, as recorded in our regional accounts, would coincide with the region where the tourist consumption actually takes place.

### **Consumption**

The main part of our work on RTSA has been related to the regional distribution of tourism consumption and of household consumption in general. The regional accounts (RNA) provide no information on the share consumed by tourists. In addition the RNA is based on "the resident principle" and the RTSA will be based on "the domestic principle". For tourism consumption, priority has been given to relating consumption to the county where it actually took place. This is presumably the county where the transaction took place, and also where it can be related to local production. The household consumption in general is distributed according to the county of residence of the household. When the tourism part of household consumption can be specified, we will have a picture of an implicit net trade pattern for tourism services.

### **Developing data to compile a regionalised TSA**

On the national level we have the TSA as a starting point. Regional and local information (on tourism consumption is restricted to occasional studies for smaller regions. However, some information on tourists' consumption in different areas by type of accommodation and nationality exists. In addition to hotel accommodation statistics there are surveys covering domestic and in-coming tourism that have been used for regionalising data on tourist flows for all types of accommodation. In part 3.1 some methodological problems connected to the implementation of consumption and tourism survey results and national tourism statistics are discussed.

## **3.1 Data needs and data quality for regional distribution of tourist consumption**

There are various approaches to identify the total production consumed by tourists and the distribution of tourists' consumption on the various types of goods and services (see for instance Frechtling 1994:368).

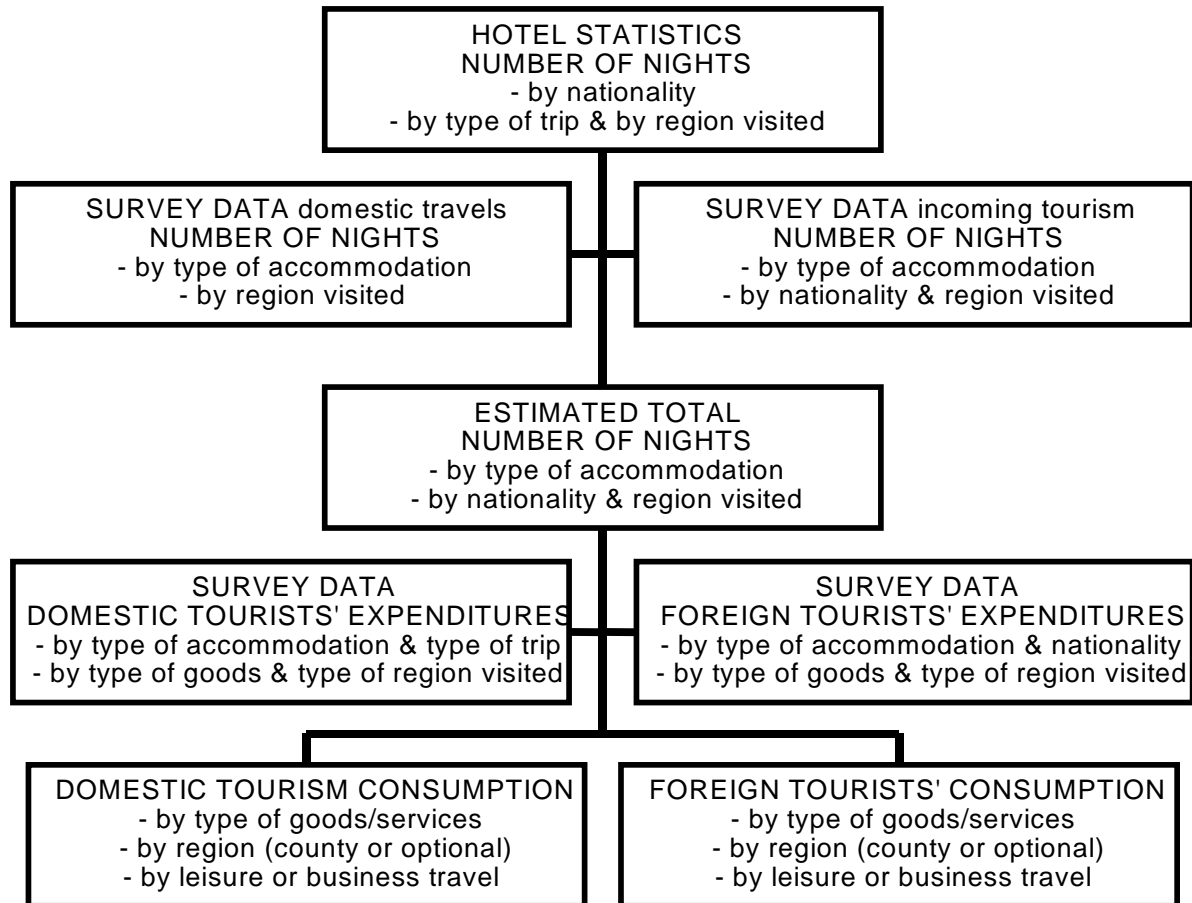
One basic type of approach is to use production data and estimate the distribution of the production of goods and services in various sectors on tourists' consumption and non-tourists' consumption. Tourists' consumption comprises products from several other production industries than the basic tourism industries. Besides, local residents may consume considerable parts of the production of characteristic tourism industries (in restaurants, leisure parks, etc). This implies that a bottom-up approach, where data have to be collected within the area of concern (often on company level), usually have to be adapted. A bottom-up approach



is generally better suited in small areas, where data collection may be kept within a reasonable extent.

An approach usually chosen in TSA work, is a top-down approach based on visitor survey consumption data and visitor statistics. The principles of the consumption-based method used for the Norwegian TSA, as well as the main information sources, are shown in figure 1. The first step is to estimate total number of tourists (and length of stay) by type of accommodation for each region. The next step is to collect survey data on consumption, specified on various goods and services as well as type of region.

Figure 1 Step-wise estimation of tourist consumption



Establishing regional TSA (RTSA) implies that the material from the statistic sources shown in the figure 1 can be broken down on county level without too high statistical uncertainty. In other words, the quality of the data is crucial for the result. An example of high quality data is the Danish tourism survey (Danmarks Turistråd 1999), compiled for national and regional economic studies of tourism. The survey comprises 60,000 interviews annually, securing a regional division of bed-nights and tourist consumption that more or less eliminate problems of statistical uncertainty.

Regional breakdown requires sufficiently large samples, and support from other indicators. Such indicators may be capacity statistics (hotels, camping, private accommodation), and regional statistics on number of second homes and the use of second homes.

### **Accommodation data**

Statistics Norway has produced hotel statistics and camping statistics (see for instance Statistics Norway 1998) for a long time, and statistics for holiday homes have now been established. However, accommodation statistics are still complete and sufficiently reliable for hotel accommodation only.

Figures for 1998 show that domestic holiday travellers spent 20 per cent only of their bed-nights in hotels and camping sites. For foreign holiday visitors the corresponding figure was 50 per cent. Hence, a considerable number of bed-nights are spent in non-registered accommodation.

The method used to determine the number of bed-nights by type of accommodation for each county was to combine hotel statistics (giving total numbers) with survey data (relative distribution on type of accommodation). The EC tourism statistics<sup>2</sup> directive in national statistics secured reasonable good data on domestic travellers. However, to obtain sufficient sample size to split accommodation data by county, it was necessary to combine quarterly surveys for two years (1997 and 1998). Still, the level of reliability remains somewhat uncertain.

As regards foreign visitors, yearly surveys of foreign visitors including interviews at all important border crossings, ferry terminals and airports were used. These survey covers both holiday and business travels, and is documented in several reports (for instance Haukeland and Rideng 2000, Jacobsen 1999). There are problems, however, when it comes to estimating distribution by type of accommodation for each region. The incoming holiday tourism is dominated by round trips including several counties, and it has been nearly impossible to record the exact number of days spent by each respondent in each county. However, by examining geographical travel patterns, and camping capacity, number of holiday homes, etc, in each county, we have reached fairly good estimates on the distribution of bed-nights by type of accommodation. The hotel statistics, which are reliable also on county level, provides the final anchor to obtain reasonable good input for the tourist consumption estimates.

### **Consumption data**

Tourist consumption data are also available from tourist surveys. The Norwegian studies used in the current RTSA work (Haukeland and Grue 1996), as well as other studies (Flognfeldt and Onshus 1996, Jean-Hansen 1996) clearly demonstrate that the total consumption as well as the distribution on items depends on several variables. The most important are type of holiday (characterised by type of accommodation) and, very important for RTSA calculations, type of destination visited. The visitor survey samples have to be large enough to supply representative data for these variables.

This is obviously a weakness of the Norwegian study. Clearly, the most significant problem is to get consumption data that are representative for both type of region and type of accommodation. The original material specifies three different types of destination (city, small city, rural area). In our RTSA work each municipality have been linked to one of these characteristics, and an index of "destination type" was established for each county.

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<sup>2</sup> Council Directive 95/57/EC of 23. November 1995 on the collection of statistical information in the field of tourism.

### 3.2 Tourist consumption on regional level: Figures from the RTSA

#### The method:

The TSA specifies consumption of more than two hundred different products. Some of these products are given the same regional distribution key as the output of the product in the RNA. Others are grouped and given a joint distribution according to regional consumption indicators. A complete list of distribution keys for the products in question will be too comprehensive in this context, but will be presented in the final report from the project (in progress). Here, we limit the presentation to giving a list of the main principles applied in our method.

We use three main types of indicators for distributing the consumption by regions:

- RNA (Regional National Accounts)
- Guest nights
- Combination of guests nights and survey data (calculated distribution)

#### RNA:

This method implies that the distribution of output is equivalent to the distribution of the consumption. For some of the tourism products the supply is used 100 %, or close to, for tourism consumption. The production in the industry is then production delivered to tourist consumption. For some of these industries, accordingly the hotels, the residence of the producer (the LKAU unit) is the region where the consumption takes place. Some transport activities, such as air travel, have been regionalised by means of traffic indicators, giving an acceptable indicator of the consumption distribution. This means that we can use the distribution of the output to distribute the consumption. This is the case for the products, or consumption groups, listed in table 2.

Table 2, Products mainly consumed by tourists. Million NOK 1997.

	Output	Import	Total supply	F	H	B	Tourist consump.	In % of output
Hotel services	7889	0	7889	3038	1959	2426	7423	94,09
Camping services	721	0	721	346	375	0	721	100,00
Other accommodation	345	0	345	176	169	0	345	100,00
Transport with railways	1498	82	1580	261	836	75	1254	83,71
Transport by bus	623	0	623	40	563	20	623	100,00
Ocean and coastal passenger transport, inland	494	0	494	226	247	0	473	95,75
Ocean and coastal passenger transport, abroad	2895	149	3044	110	330	925	2813	97,17
Air transport	12271	1184	13455	203	3284	7223	12273	100,52
Tour operators	7370	0	7370	0	7370	0	7370	100,00
<b>Sum:</b>	<b>33440</b>	<b>1415</b>	<b>34855</b>	<b>4400</b>	<b>15133</b>	<b>10669</b>	<b>33295</b>	<b>97,70</b>

#### Guest nights.

The problem by using guest nights as a distribution key is that we ignore the fact that different accommodation services differ in prices, and that the level of tourist consumption is dependent on the choice of accommodation services. But in our case there is one exception, the resident industries' expenditures on business travel in Norway (B). This is because an assumption in the TSA is that a person travelling on industry expenditures is staying in hotels and therefore will have the same level and content of consumption expenditures. This means that every guest night will generate the same consumption expenditures and therefore can be used as a distribution key.

### ***Combination of guest nights and survey data (calculated distribution)***

For the consumption of the remaining products the benchmark is the distribution of the accommodation services, measured by guest nights. The problem is that this information is not sufficient as a distribution key for the tourist consumption. That is because the different accommodation services generate different patterns of consumption. Using the accommodation figures means that we assume *a constant level of consumption expenditures independent of the type of accommodation services the tourists are using*. In addition - the fact that the prices of the accommodation service itself, for instance a room in a hotel, will vary depending on *categories / purpose of staying*, makes the guest nights a non-preferable choice.

To be able to use guest nights data to the fullest extent, we needed data on the *consumption level* and the *content of the consumption for the different accommodation categories*. We chose to combine the data of guest nights with the survey data on the level and content of the consumption. Multiplying guest nights with consumption levels gave us the level of different consumption categories for each region, a calculated distribution of the consumption groups in the TSA.

An additional argument for carrying out this calculation is that we wanted to separate foreign households' consumption from foreign industry expenditures. Such information is not available in the TSA, but we have data on guest nights for the two different categories that we prefer to use. Using the distribution of the calculated figures we were able to separate the two accommodation groups. The calculation gave us the distribution between the two categories of foreign tourists.

#### **Results:**

The first problem was that the calculated consumption level on the national level did not harmonise with the level from the TSA. The main problem is probably the reliability of the survey data (see part 3.1). Nevertheless the TSA level is regarded as a benchmark.

In spite of the fact that the calculated distribution resulted in a different level than the TSA, the combined data gave us useful information. We used the regional distribution of the calculated consumption as distribution keys according to the consumption groups from the TSA.

#### ***The final distribution***

Figures for the regional TSA are presented in the three following tables. These are based on preliminary figures for accommodation and therefore not yet considered final. The final distribution will imply some minor changes, mainly in the county of Oppland.

In the following tables, we have divided tourists' consumption into four main categories. These are non-resident industries' expenditures on business travel (FH), non-resident households' tourism consumption (F), resident households' tourism consumption (H) and resident industries' expenditures on business travel in Norway<sup>3</sup> (B).

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<sup>3</sup> Notice that "resident industries total expenditures on buissness travel" by definition is different from "the total expenditures of individuals travelling mainly on expense of privat or public domestic establishments". This is the case because a person who travels for business purposes may buy services and/or goods on her trip which are not paid by her employer, but by her own household.

County	Tourist consumption of characteristic tourism products				TOTAL
	FH	FB	H	B	FH+FB+H+B
Østfold	123	29	433	87	673
Akershus	902	592	3 003	4 646	9 142
Oslo	941	1 824	1 560	1 494	5 819
Hedmark	301	68	844	99	1 311
Oppland	526	236	2 367	268	3 397
Buskerud	382	172	1 565	244	2 363
Vestfold	143	65	871	270	1 349
Telemark	214	78	1 150	192	1 634
Aust-Agder	164	58	475	120	817
Vest-Agder	205	73	749	275	1 302
Rogaland	438	362	1 183	902	2 886
Hordaland	913	387	1 319	987	3 607
Sogn og Fj.	392	95	682	143	1 312
Møre og R.	300	97	895	333	1 625
Sør-Tr.lag	268	98	1 350	290	2 006
Nord-Tr.lag	106	47	497	321	971
Nordland	377	162	1 285	926	2 750
Troms	267	93	676	574	1 611
Finnmark	145	46	330	193	713
<b>Total</b>	<b>7 108</b>	<b>4 580</b>	<b>21 234</b>	<b>12 366</b>	<b>45 288</b>

Table 3. Tourist consumption of characteristic tourism products. Million NOK 1997

County	Tourist consumption of other products				TOTAL
	FH	FB	H	B	FH+FB+H+B
Østfold	154	12	431	0	597
Akershus	119	47	755	0	921
Oslo	297	880	598	0	1 775
Hedmark	520	41	809	0	1 371
Oppland	525	170	2 332	0	3 028
Buskerud	321	107	1 450	0	1 878
Vestfold	76	9	878	0	963
Telemark	224	45	1 113	0	1 382
Aust-Agder	167	19	442	0	629
Vest-Agder	242	19	596	0	857
Rogaland	421	142	734	0	1 297
Hordaland	695	135	836	0	1 667
Sogn og Fj.	569	55	533	0	1 156
Møre og R.	330	34	643	0	1 007
Sør-Tr.lag	203	42	1 058	0	1 303
Nord-Tr.lag	82	10	331	0	424
Nordland	248	40	745	0	1 033
Troms	203	25	344	0	572
Finnmark	130	24	228	0	381
<b>Total</b>	<b>5 525</b>	<b>1 856</b>	<b>14 858</b>	<b>0</b>	<b>22 239</b>
Difference from TSA, due to inclusion of food consumption for T in RTSA					<b>5 079</b>
From TSA:					<b>17 160</b>

Table 4. Tourist consumption of other products. Million NOK 1997

As we can see from table 5, the Oslo- and Akershus region is the largest regarding tourism consumption. Approximately 26 percent of the total were allocated to this area. Well over half of this is due to business travellers' expenditures. More than 50 percent of the total domestic and non-domestic business expenditures in Norway are spent in this region.

County	Tourist consumption				TOTAL FH+FB+H+B
	FH	FB	H	B	
Østfold	277	41	864	87	1 269
Akershus	1 021	639	3 757	4 646	10 063
Oslo	1 238	2 704	2 158	1 494	7 594
Hedmark	821	109	1 653	99	2 682
Oppland	1 051	406	4 699	268	6 425
Buskerud	702	279	3 015	244	4 241
Vestfold	219	73	1 749	270	2 312
Telemark	438	123	2 263	192	3 017
Aust-Agder	331	77	918	120	1 446
Vest-Agder	447	92	1 345	275	2 159
Rogaland	859	503	1 918	902	4 183
Hordaland	1 608	523	2 155	987	5 273
Sogn og Fj.	961	150	1 215	143	2 469
Møre og R.	630	131	1 539	333	2 632
Sør-Tr.lag	471	139	2 408	290	3 308
Nord-Tr.lag	188	57	828	321	1 394
Nordland	624	201	2 030	926	3 782
Troms	471	118	1 020	574	2 183
Finnmark	274	69	559	193	1 095
<b>Total</b>	<b>12 633</b>	<b>6 436</b>	<b>36 092</b>	<b>12 366</b>	<b>67 527</b>

Table 5. Total tourism consumption. Million NOK 1997.

For Oppland and Hedemark the opposite is the case. For these regions resident and non-resident households consume the main share of the tourism consumption. These counties are also two of the dominating counties according to the value of the tourism consumption. But the level itself is not the only interesting indicator. Another way to put the figures is to relate them to other indicators such as production, total consumption, size of population etc. The following figure 2 shows the total tourist consumption pr. inhabitant in the nineteen counties. Oppland, Sogn og Fjordane and Akershus have the highest level of tourism consumption pr. person living in the county.

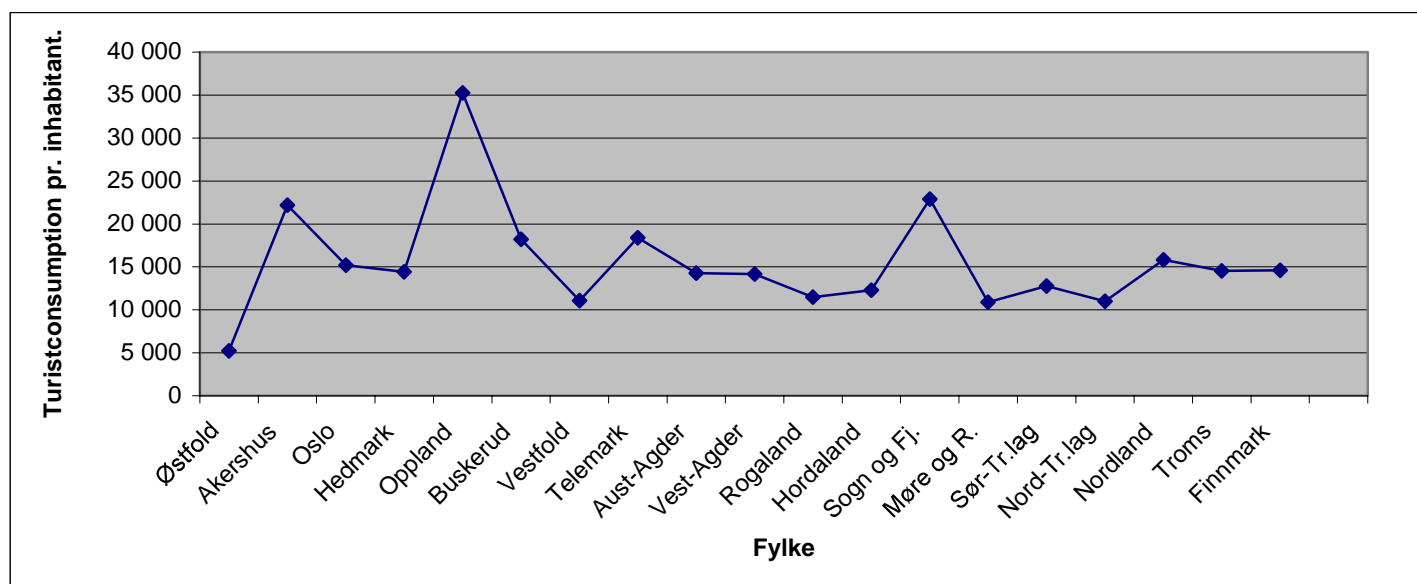


Figure 2. Tourism consumption pr. inhabitant each county. NOK.

#### TSA versus RTSA:

In the RTSA the tourist consumption for non-residents, F, is split in two categories:

- FH, Non-resident households' consumption

## - FB, Non-resident industries' expenditures on business travel

Another deviation between TSA and RTSA is the resident households' tourist consumption. Countries within the EU and the EEA have to use a set of guidelines for producing regionalised national accounts, as they are presented in a manual produced by Eurostat (1995). There is no particular manual relating to regional tourism accounts. However, several principles may be inferred from the manual on regional national accounts. The main principle has been to apply the national guidelines to each region as if the regions were small nations. So, for instance, in the OECD guidelines that we presently use for our tourism accounts, the rule is that normal food consumption for resident tourists on travel does not belong to tourism consumption (only extra expenditures do). For non-residents all expenditures are included. Applying this principle to a region, food consumption for tourists resident in other regions of the county is included in tourism expenditure as with expenditure of foreign tourists. To keep the link with the tourism accounts on the national scale, all tourists residing in Norway shall be classified as domestic tourists. The tourist consumption of food will, however, be different. As a large part of domestic tourism is for own holiday homes, this could have some importance. Of course, classifying food consumption as tourism consumption in a region does not imply that the food is produced in the region, although most of the related trade margins probably are.

### **Tour operators:**

The recording of tour operator services is a classic challenge to tourism accountants. In our regional accounts, as in the national accounts, there is a gross recording of tour operator services. Hence, the full amount paid for the package tour is the production of the tour operator, and his expenses for transport, accommodation, meals etc, in short the components of the package tour, are intermediate consumption for the tour operator. This implies that the product 'package tours' is produced in the region of residence of the tour operator, while actual consumption of the tourism services could well occur in other regions. Norwegian tour operators mainly organise travels abroad. In that case it is reasonable to say that the actual consumption of the services takes place abroad, with the exception of the margin of the tour operator. So, the consumption could be distributed as if package tours are recorded net.

### **Distribution of output in the tourism industry.**

As described in part 3.2 we have used the distribution keys from the RNA to regionalise the output in the tourism industries. The distribution is given in table 6.

The first row in table 6 indicates the tourism industry according to the following list:

1. Hotels and restaurants
2. Transport via railways, tramway and suburban transport
3. Scheduled motor bus transportation and taxi operation
4. Ocean and coastal water passenger transport abroad
5. Inland water transport
6. Air transport
7. Activities of travel agencies etc.
8. Rental of transport equipment
9. Motion picture and other entertainment, news agencies and cultural services
10. Sporting and other recreational activities.

Tourism industry. County	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	Total output in tourism ind.
Østfold	901	199	252	13	29	0	405	51	423	35	2307
Akershus	2540	284	2006	187	150	9760	1847	268	1131	97	18270
Oslo	7047	2938	1331	1424	152	544	4727	340	3927	87	22517
Hedmark	849	343	359	1	3	0	255	29	467	34	2341
Oppland	1611	229	396	2	5	2	427	6	353	33	3062
Buskerud	1721	577	424	1	1	0	232	63	445	59	3523
Vestfold	1020	63	319	182	84	177	195	65	442	34	2579
Telemark	1071	201	262	26	22	30	148	60	385	27	2231
Aust-Agder	546	34	202	135	7	21	110	17	154	17	1244
Vest-Agder	896	204	272	141	61	177	160	42	438	26	2416
Rogaland	2438	202	721	374	566	1849	502	322	930	53	7956
Hordaland	2957	365	839	694	480	1190	539	166	1035	60	8324
Sogn og Fj.	816	41	261	5	402	181	130	23	215	8	2082
Møre og R.	1187	19	337	48	1023	411	198	77	387	20	3706
Sør-Tr.lag	1811	668	591	16	296	82	481	48	799	45	4838
Nord-Tr.lag	548	94	190	5	108	492	81	36	235	25	1812
Nordland	1353	390	498	10	890	1527	110	76	724	25	5602
Troms	1099	0	263	7	655	782	208	29	297	15	3354
Finnmark	479	0	168	1	22	217	69	22	214	7	1198
Extra regio	0	0	1	0	0	89	80	4	177	0	350
Total	30889	6852	9690	3271	4954	17531	10900	1742	13176	706	99711

Table 6. Distribution of output in the tourism industries at basic prices. Current prices, MNOK.

## 4 A simulation example

In previous sections of the paper, we have discussed the consistency requirements between the RTSA, the TSA and the (regionalised) national accounts. These requirements have been fulfilled according to international standards. The principles and some main figures from the RTSA have been presented above. In this section, we will discuss how the impacts of changes in tourism can be simulated, given information from the RTSA and a simulation model, and also present an example based on an existing input-output model.

### 4.1 Choice of model

In the pilot study that was conducted before this project (Dybedal et al 1999), different simulation models for assessing the regional impacts of tourism in Norway were discussed. Dybedal et al (op.cit) discussed different classes of models (i.e. equilibrium vs disequilibrium), but the focus of the discussion was to what extent existing models, and the amount of work and information put into these, could be applied. Existing macroeconomic regional models in Norway are the two input-output models REGION (which is an interregional model) and PANDA (which is a single region model). Both models are based on input-output tables from the regionalised national accounts, where the county level is the basic regional level. Exogenous final demand is the main component driving these demand side models.

In the pilot study, several ways of modifying these models were discussed. Tourist consumption is an exogenous activity to the regional economy. The tourists demand certain goods and services (a consumption pattern) and use a certain amount of money. In this sense, tourism is an exogenous category of final demand. On the national level, native tourists' consumption can be regarded a part of private consumption and thus adds up to zero (see section 3.1). Regionally, consumption by tourists from the same nation, but from other



regions, is exogenous to the economy. However, in an interregional world, native tourists' consumption when travelling may be considered endogenous to the visited regions' economies.

### **Modifying existing models**

In the pilot study, several ways of modifying existing models were discussed. Since foreign tourist consumption is a category of final demand, foreigners' tourist consumption would in all cases have to be decided outside the input-output core of the model (exogenous to the economy in that sense). This, of course, does not imply that policies and marketing efforts directed towards increasing the number of foreign tourists, and the amount of money they spend in the region, is pointless. It only implies that these models are not constructed for answering the question of how these efforts work. The exogenous character of foreign tourist consumption is common to both regional models.

The second question was how to implement tourist consumption by residents in other counties. PANDA is a single region model, and all activities outside the region are exogenous. In PANDA, therefore, residents' tourist consumption can be treated similarly to the consumption of foreign tourists. In REGION, the interregional model, there are several ways of treating national tourists' consumption. The simplest way is to treat it exogenously, as in PANDA. Another way of including it, is to let tourist consumption in county *r* depend on income levels in other counties. This would, however, mean specifying several new equations in the model.

Finally, there is the question of how to specify activities in the tourist industries as well as in the industries where tourists' consumption is important. This could also be done in two ways. One is to modify the input-output core of the models by specifying new tourism industry equations. Another, and more simple (but not as precise) way, is to construct a sub-model where tourist generated activities are separated from the non-tourist generated activities.

The Research Council was not interested in financing work on modifying the existing models. Therefore, we have not done so. The principles for doing so are presented by Dybedal et al (1999), as well as here in a shorter version. However, the Research Council was interested in us utilising the RTSA for modelling purposes, in a 'third way'.

### **A third way**

Models for calculating impacts of tourist activities will be used for analysing the importance of tourism for regional economies. The county level is only one in a hierarchy of regions. Lower regional levels, for instance the municipal level or groups of municipalities, are also important regions. The pilot study (Dybedal et al 1999) therefore proposed to make a relatively simple economic model, which can be used for calculating tourism multipliers on different regional levels *below* the county level. Information from the regionalised national accounts and from the RTSA was proposed as basic information for calculating these multipliers. However, the pilot project proposed a relatively flexible model, where additional information collected locally can be applied directly, substituting information from the RTSA and/or the regionalised national accounts where appropriate. Substituting existing information will give better estimates for local multipliers, but is more costly than applying existing data.

### **What did we do, finally?**

The pilot study resulted in resources being allocated to developing a RTSA, as well as to developing a simple economic model (the 'third' way), but not for modifying existing models using the RTSA. However, parts of a relatively flexible system (PANDA), can substitute the

‘third’ way. We therefore have focused on constructing a pre-model for tourist consumption in each county. The three (four) categories of tourists’ consumption pattern can be used as exogenous final demand categories, and the input-output structure for each county in PANDA as the core of the model.

## 4.2 Simulation example

In this section, we will show how the regional impacts of changes in tourism can be calculated using information from the RTSA and the input-output core of the PANDA model.

Information on tourist consumption in a region is given in the form of the following matrix:

	Foreign holidaymakers	Foreign business travellers	National holidaymakers	National business travellers	All tourists
Characteristic tourism products (several)					
Other products (several)					
SUM					

The tourist consumption by category is given in NOK (see previous chapters), and divided between several characteristic tourism products and several other products. Since the PANDA model’s base year is 1992, and the RTSA is from 1997, we have only looked at the distribution of consumption by products. We have also chosen to limit the simulation to the category ‘all tourists’, rather than looking at each category of tourists. Tourist consumption is considered as exogenous to the regional economy.

Given PANDA’s single region structure, we had to choose one county. Hordaland was chosen, as it is a typical touristic region on the west coast, with fjords and mountains as well as the second largest city of Norway<sup>4</sup>. Given the distribution of all tourists’ consumption of characteristic tourism products, we looked at a 10 per cent increase in tourist consumption in Hordaland (NOK 500 million, 1992 money).

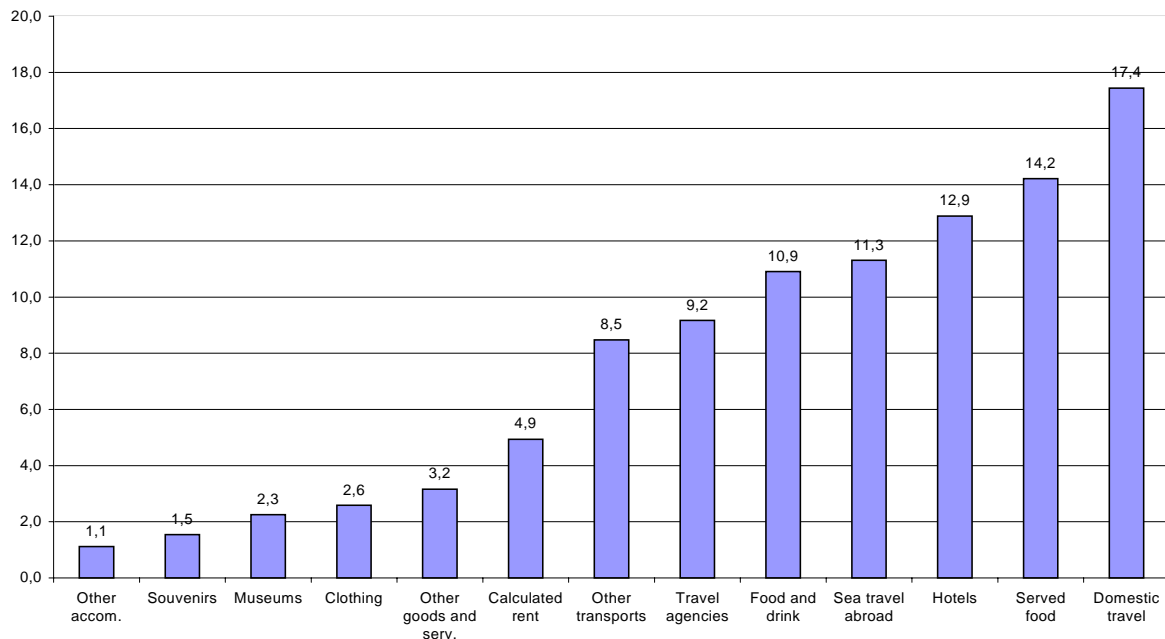
The PANDA model is a sector-by-sector input-output model. Exogenous final demand drives the regional economy, under the assumption that there are no capacity limits to the economy. This means that there are no restrictions on the supply side, and resources are utilised as (final) demand changes. Given an exogenous increase in final demand (i.e. tourist consumption), the local economy responds by producing more. This leads to increased employment, increased demand for intermediate deliveries (in the local/regional economy and imports from other parts of the country and from abroad<sup>5</sup>) and increased income (and subsequently increased private consumption). Total effects are the sum of the initial impulse and secondary and induced impulses (the production multiplier). No crowding out mechanisms or price effects are assumed. This implies that the model describes the economy better in times of high unemployment than in times of relatively low unemployment, and thus

<sup>4</sup> Similar simulations can of course be made for any county in Norway.

<sup>5</sup> Regional ‘self sufficiency rates’ are estimated from data in the model’s base year

one might call the production multiplier an expression of the county's production potential per extra NOK spent by tourists.

Figure 3: *Total tourist consumption by category. Per cent of total, Hordaland 1997.*



In the figure, the distribution of tourists' consumption in Hordaland by product category is shown. Almost six billion NOK was spent totally by tourists in Hordaland in 1997. The majority of the consumption is on travel, food and accommodation, or on getting around, getting fed and sleeping. Only a minor part of the money is spent on souvenirs and museums.

When simulating, we have assumed a self sufficiency rate of 100 per cent for tourist consumption in Hordaland. This means that all the money spent by tourists in Hordaland is spent in Hordaland. For intermediate deliveries, however, the self sufficiency rates vary. This means that the sectors of production in Hordaland are not able to produce everything that is demanded in the county, and that only a part of the intermediates comes from sectors within the county. The rates of self sufficiency vary substantially; for some products it's zero, and for others it's 100 per cent. We will not discuss the details here.

In addition, we have had to re-code the tourism products to fit PANDA's 30 sector-by-sector input-output matrix. This re-coding is not totally accurate, because the products' aggregation levels are not completely comparable, but it's accurate to more than 90 per cent.

We have made two simulations on the model. The first one is the base alternative, where growth rates for exogenous final demand are consistent with growth rates in the Government's Long Term Programme (Johansen et al 1993). The second one is based on the same assumptions, but we add the exogenous change in tourists' consumption of NOK 500 million (a 10 per cent increase), where the demand distribution follows the pattern in the figure above. An increase of NOK 500 million is an imaginary figure, but it can be realistic if Norwegian tourists increase their travels to Hordaland or if foreigners increase their travels there. Several factors influence the tourists' choice of destination, for instance increased incomes, changed preferences (due to for instance marketing efforts), changes in currency rates, the number of business conferences or others. We will not discuss them here, only point out that tourism is

an important issue for local and regional authorities and businesses, but that the competition between different regions is great.

Given the direct increase in tourist consumption and the spending pattern of tourists, one can calculate indirect and induced impacts through the input-output structure of PANDA. Given the model's linear structure, one can argue that the impacts will be similar if the change in tourist consumption in fact was negative. The difference between the two simulations shows the impacts of the changes in tourism – direct and indirect.

The simulations are based on an assumption that *resource based production* and *production of public services* are determined outside the input-output core of the model. In other words; production in these sectors are not influenced to a great extent by demand inside the region, and thus not by changes in regional demand. For some of these sectors, production is based on political decisions, while in production in others is based on the resources and markets outside the region. In table 7, the sectors where by assumption production is determined exogenously are denoted 'E'.

Table 7: Direct, Indirect (incl. Induced) and Total impacts of a 10 per cent (NOK 500 million 1992 prices) change in tourism consumption in Hordaland. "Multipliers".

	Direct	Indirect	Total	'Multiplier'
Agriculture		E	0	
Forestry		E	0	
Fishing		E	0	
Fish farming		E	0	
Mining		E	0	
Fish processing		2	2	
Processing of other foodstuffs		13	13	
Textiles		1	1	
Wood and timber		0	0	
Processed wood		1	1	
Graphics a.o.		4	4	
Chemicals		5	5	
Minerals		1	1	
Iron and ferro		1	1	
Other manufacturing		6	6	
Shipbuilding		E	0	
Furniture		0	0	
Power and water		6	6	
Construction		16	16	
Oil and gas		E	0	
Wholesale and retail trade	67	23	90	1,33
Hotels and restaurants	141	7	148	1,05
Foreign sea transports	57	18	75	1,33
Domestic transports	130	23	153	1,18
Post and telecom	0	11	11	
Bank and insurance	0	9	9	
Business services	25	36	61	2,47
Other private services	81	13	94	1,17
Municipal services		E	0	
State services		E	0	
Production impacts	500	196	696	1,39

The multiplier in table 7 can be found at the bottom of the table (the last row) to the right. It denotes that if tourist consumption in Hordaland increases by 1, the total production increase will be 1,39. In the final column of the table, we have added 'multipliers' for each tourism industry. These are not really multipliers; they are dependent on the sector distribution of the direct impact (the consumption increase), but it shows that an increase in tourist consumption increases production in these sectors by more than the initial increase. In fact, 120 million NOK of the total indirect and induced effects can be found in what we have defined as 'tourism sectors' (sectors with direct impacts from tourism). None of these sectors are, in other words, pure tourist sectors. The most touristic of them, measured by the lowest fraction between total and direct impacts, is 'hotels and restaurants', where the indirect and induced impacts are only 5 per cent of the direct impacts. The least touristic is 'business services', where the indirect and induced impacts of tourism are 147 per cent of the direct impacts.

Tourist consumption is defined as consumption of services. Structurally, most induced impacts can be found within production of services as well. In addition, some of the intermediate deliveries will also be between tourism sectors and non-tourism production of services. All together, most of the secondary impacts of tourism can be found within production of services. Around 140 million NOK of the secondary impacts will be in these sectors all together. The rest, around 55 million NOK, can be found within manufacturing (including construction). This distribution of secondary impacts across activities is comparable to findings in simulations of impacts of other types of activities (see for instance Karlstad 2000, Johansen og Nilsen 1999, Freeman and Sultan 1997, Johansen og Onsager 1993, Toresen 1989).

## 5 Final comments

In this paper, we have presented some major results from an ongoing research project in Norway. The aims of the project are to construct a Regional Tourism Satellite Account (RTSA) system for Norway and to construct a simple simulation model to analyse impacts of changes in tourism on the regional level. The project will be finished this year.

Remaining work is connected mainly to publishing the results from the project. The data presented in this paper are preliminary, and the final data on tourist consumption will be adjusted. This applies especially to the county of Oppland, but the adjustments will probably be relatively moderate. In addition, multipliers for each county will be developed for constructing 19 simple single-region tourism impacts models. Both data and model papers and reports are being written and will be published during the autumn of 2001.

Future work is dependent on finances. The production of TSA is continuing on the national level. Producing RTSA can be done in conjunction with this and with the RNA, but it additionally needs some indicators for distributing (parts of) tourist consumption regionally. This requires money. Focus in the RTSA work has been laid on *consumption* rather than on production. Additional work could have been put into the production side as well. This also requires money. The third focus on the data side, that probably would prove quite expensive, would be improving the indicators used for distributing tourist consumption (and production in tourism industries) regionally. This would mean increasing the number of respondents, at different tourist sites and border crossings, to improve the quality of the data used for constructing regional distribution indicators.

When it comes to modelling, both interregional and single-region models have a potential for being improved using the RTSA statistics, as discussed in chapter 4. However, the simplified

model described will be used for local and regional analyses of impacts of tourism, if the demand for such analyses exists. This model, one for each county, can be modified with local and regional information, depending on the willingness to pay for collecting this information.

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