

Chapter 2

A Meta-analytic Comparison of Regional Output Multipliers at Different Spatial Levels: Economic Impacts of Tourism

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2.1 Introduction

On a local (town) scale, tourism is more and more being regarded as a possible instrument to change the future. With decreasing employment in agriculture, tourism is often seen as a new activity in the rural economy, generating employment and income and at the same time embracing local tradition and (landscape) qualities.

Over the last decades, tourism has become a major activity in our society and an increasingly important sector in terms of economic development (Giaoutzi and Nijkamp 2006). Higher incomes and a greater amount of leisure time, together with improved transport systems have resulted in a growing flow of tourists, travelling more frequently and over longer distances. According to Pearce (1981), the socio-economic effects of tourism are very diverse. When focusing on small and medium-sized towns, important effects are regional development, diversification of the economy and employment opportunities. Because tourism also addresses more rural and peripheral areas, it allows the spread of economic activities more evenly over a region. In the peripheral areas, tourism can be helpful in improving the multifunctionality of the local area, leading to more robust economic development. Finally, as tourism is a rather labour-intensive sector, also requiring unskilled labour, it can be a good employment opportunity for small and medium-sized towns.

This has recently prompted much policy and research interest in the benefits of tourism for regional income and employment. Policy makers in the government need to know the magnitude of the impact of international and domestic tourist expenditures on the economy in order to make decisions about budget allocations for the development of tourist facilities (Freeman and Sultan 1999). But there is a great deal of variation, and the question emerges whether such variations can be ascribed to systematic factors.

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Therefore, in this chapter we will perform a meta-analysis on tourism multipliers. As multiplier values reflect the size of the multiplier effect, with respect to a specific feature of the economy such as income or employment, these values can help policy makers to learn something about the magnitude of tourist expenditures. Within a meta-analysis the empirical outcomes of studies with similar research questions are analysed (Baaijens et al. 1997). The research question we want to answer in this paper is:

Which characteristics of the tourism sector, the research area, or the type of publication in which a study appeared can explain variations in the size of the tourism multiplier?

Therefore, first, in Sect. 2.2, we elaborate on the meta-analytic approach. Then, in Sect. 2.3, we will briefly describe the input–output model and its multipliers. In Sect. 2.4, we explain the order of magnitude of the multipliers, followed by an initial analysis of the empirical data. After this, in Sect. 2.5, we perform a linear regression on our available data. Another meta-analytical method, viz. Rough set analysis, will be applied in Sect. 2.6. We then use the obtained insights to develop and reflect upon tourism multipliers for six Dutch towns in Sect. 2.7. Finally, in Sect. 2.8, some research conclusions will be drawn.

2.2 Meta-analysis

Meta-analysis can be defined as the “study of studies” (Glass et al. 1981). It refers to the statistical analysis of individual studies with the same research question in order to integrate the findings. In meta-analysis, outcomes from a collection of studies are combined in order to draw general conclusions. It was initially applied in the medical and natural sciences, where it was used to compare the result of (semi-) controlled experiments. Meta-analyses can be performed in almost all thinkable research fields. In the economic sciences, examples are: Nijkamp and Vindigni (2000) who studied the agricultural sector in several countries; Nijkamp and Pepping (1998) and Holmgren (2007) who all analysed public transport demand; van den Bergh et al. (1997) who dealt with environmental economics; and Baaijens et al. (1998) and Brander et al. (2007) who studied tourism-related subjects.

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

In meta-analysis there is often a concern that it is only studies which have obtained significant and expected results (at least the right sign) that are being published. It is possible that studies using sound methods and good data will not be reported because the results are not as expected (Begg 1994). Therefore, for a meta-analysis, it is important to be aware of this bias, and if possible to search for publications in all kind of fields and from different sources (such as refereed journals, research papers, or reports).

2.3 Input–Output Analysis and Multipliers

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

As described in Chap. 4, the basic information dealt with in input–output analysis concerns the flows of products from each industrial sector considered as a producer to each of the sectors considered as a user (Miller and Blair 1985). When the demand changes in one of the sectors, this can affect many other sectors as well, especially when they deliver or buy intermediate products from the sector concerned.

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

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

In the meta-analysis undertaken in this study, we look at output multipliers. The reason for this is that, in the sample of studies that we found, these multipliers are most often used.

2.4 Data Analysis of Tourist Multipliers

For our meta-analysis we were able to collect 32 case studies from 27 publications, which contain estimates of tourist multipliers including a (type II) output multiplier (see Appendix 1 for the references). A precondition was that the multiplier had to be derived with the help of input–output analysis. Also a (brief) description of background factors concerning, for example, the area and the tourist activities had to be given. Appendix 2 shows the characteristics we used together with the classification.

2.4.1 The Database

More than half of the case studies are (non-refereed) reports found on the Internet. These reports are often written by researchers to give local authorities insight into tourist situation of the area concerned. A fifth of the case studies collected are papers written for scientific conferences. In addition, several articles from refereed journals have been included. As Fig. 2.1a shows, conference papers estimate, on average, the highest multipliers, whereas the articles give relatively low values. We also incorporate the year in which the data was gathered in order to build the input–output table. In two instances this was before 1990, and in six instances it took place in 2000 or later. On average, as Fig. 2.1b shows, the oldest multipliers are the highest and the newer ones the lowest.

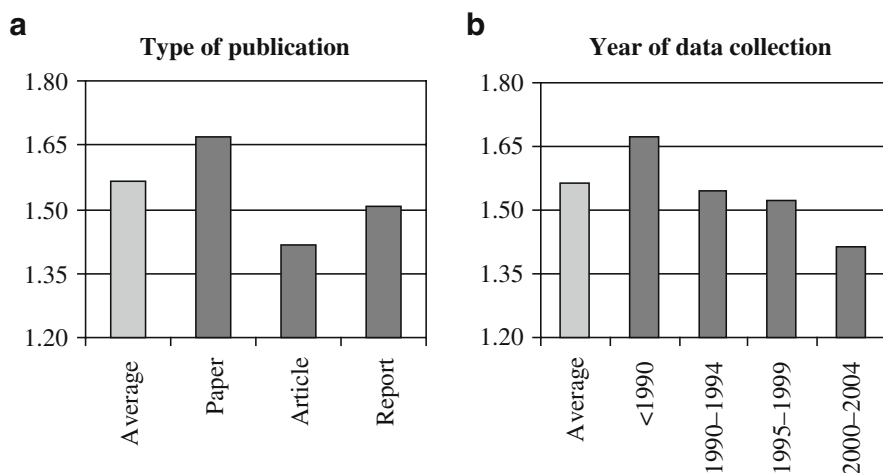


Fig. 2.1 Average multipliers according to type of publication (a) and years of data gathering (b)

Of course, not only characteristics of the reports affect the size of the output multiplier but also the characteristics of the areas which are described. Around half of the areas have a population density below 100 persons per km². Even a third of the studies have a population density of less than 30 persons per km². These areas are often the places with high nature values. The parts of the studies with the highest population density are related to urbanized areas or cities.

Figure 2.2a shows that, under type of area, multipliers concerning countries are higher on average than, for example, the average multiplier values of a city. This is partly because a city has to import a large part of its inputs, which lead to leakages. This also applies to a region or national park.

However, Fig. 2.2b shows that not only the size (here in terms of population) matters; the areas with the smallest population do not necessarily have the lowest multipliers. Nevertheless, the areas with a large population (8 studies) do have on average the highest multiplier.

Besides the publication and area-specific characteristics, tourism itself also has to be included in this multiplier analysis. The next two graphs (Fig. 2.3a and b) show the average multiplier values related to the type of attraction, as well as to the expenditures per square kilometer (*1,000\$/km²). In many studies, the visitors are attracted to their holiday destination by a beautiful landscape. A slightly smaller number of studies relate to tourists visiting an area because of the cultural values. Furthermore, we distinguish a group of studies in which people visit a place, because they want to enjoy the sun or because of a mix of values.

According to Fig. 2.3a, areas with tourists who want to enjoy the sun are related to the highest output multipliers. An explanation for this could be that people who visit areas to enjoy the sun often do not travel around a lot but stay in the village or hotel and spend all their money locally. On the other hand, visitors searching for culture have (very) small multipliers.

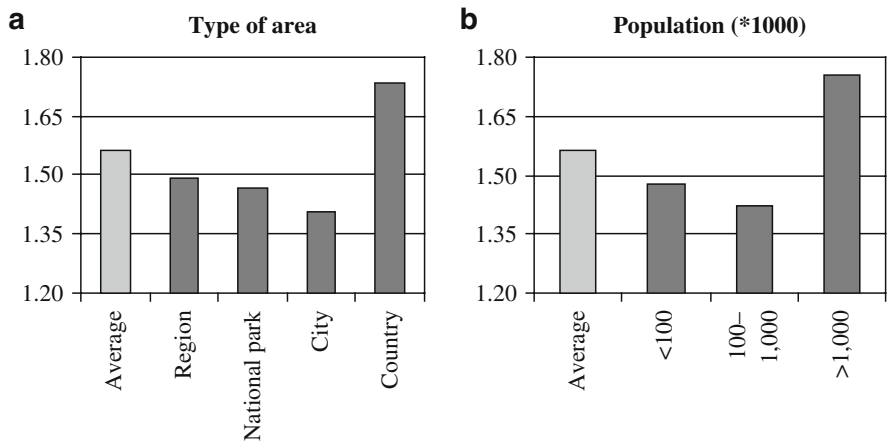


Fig. 2.2 Average multipliers according to type of area (a) and population (*1000) of the area (b)

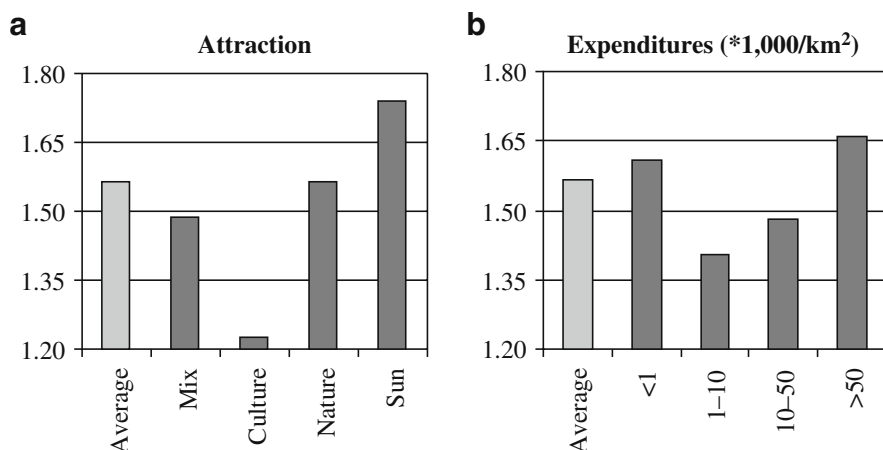


Fig. 2.3 Average multiplier values according to kind of attraction and total expenditures per year

From the data, it appears that areas with large expenditures have the highest multiplier values. However, this is partly related to the scale effect. Figure 2.3b shows the average values of the multipliers according to total tourist expenditures per year related to the size of the area. When looking at expenditures per km², it appears that there is no clear linear effect: both areas with the smallest amount of expenditures and those with the largest amounts have high multipliers. Obviously, we need to keep in mind that the multipliers themselves describe the effect of expenditures.

Of course, all these figures only show average multiplier values and they do not reveal anything concerning any relationship or coherence between the different indicators and the size of the output multipliers.

2.5 Linear Regression Results

2.5.1 Introduction

Linear regression is a standard technique that can also be used in meta-analytical experiments, insofar as statistical results from a sample of previous studies are analysed. This statistical model presupposes that there is a one-way causation between the dependent variable Y and the independent variable X. However, because we have only a limited number of studies available, it is not plausible that the assumptions of the standard linear regression are satisfied, for the variances of the distant multiplier values are not equal (see also Baaijens and Nijkamp 1996).

The analysis starts with the formulation of a set of hypotheses, which we will verify with the help of the linear regression model.

- Hypothesis 1: The larger the economic base, the higher the multiplier. As described in the section on multipliers, a larger economic base needs less import.

Import can be seen as a leakage of money to other regions. Therefore, it may be expected that the size of the land area or the size of the population has a positive effect on the multiplier. In particular, countries as a whole will have lower imports.

- Hypothesis 2: The more visitors or expenditures of visitors, the higher the multiplier. The visitors or at least the expenditures of the visitors may cause a higher multiplier as a result of cluster effects.
- Hypothesis 3: The longer ago the multiplier has been derived, the higher the multiplier. If we assume that the tourism sector has changed over the years and becomes more internationally oriented, the “older” multipliers should be higher

2.5.2 Results of the Regression Analysis

The estimation results for the output multiplier equations can be found in Table 2.1. When looking at the correlation between the variables with help of a bi-variate Pearson correlation, we find that several variables are related. We find, for example, a positive significant correlation between population and area or visitors and expenditures. Therefore, the variables size of area and number of visitors are excluded from the regression analysis.

The first equation focuses on the meta-variables. If we take into account R^2 , which describes the proportion of the total variation in the dependent variable (the output multiplier) explained by the regression of the variables, we see that the meta-variables describe only 12%. The equation shows us that the year of data collection is of significant importance: the more recent the data, the lower the multiplier. Furthermore, multipliers published in an article are lower than those published in a report, and those published in a paper are higher. However, in this equation these documentation variables are not significant.

The second equation uses the variables related to the characteristics of the area concerned. It appears that, in particular, the size of population is significant, the larger the population, the higher the output multiplier. Furthermore, the country dummy is significant. This dummy variable has the value 1 if the area is a country, and a 0 if the area is for example a region or a city. Because the country dummy shows a positive coefficient, this can indicate that the boundaries of countries prevent, to a certain extent, leakages.

When looking at the next column, with the tourism-specific variables we find again that the year of data is of importance, and so is the expenditures variable. This last variable indicates that more expenditures lead to higher multipliers, when no area-specific variables are taken into account. The dummies that describe the factor which attracts visitors, e.g. nature values, cultural values, or sun, are not significant in this equation.

The final equation includes all variables distinguished for the regression analysis. We find five variables that show significant coefficients. As can be found in the table, the year of data has a negative effect on the multipliers. This means that when the data are younger, the multipliers get lower. It also appears that when a multiplier

Table 2.1 Regression equations of the output multiplier

Variable	Meta-variables	Area-specific	Tourism-specific	All variables
	1	2	3	4
Constant	1.95***	1.484***	1.480***	1.720***
t-value	10.016	23.647	8.738	11.63
Year of data (0 = 1980)	-0.025*		-0.019*	-0.018**
t-value	-1.673		-1.819	-2.147
Conference paper (dummy)	0.143			0.012
t-value	0.936			0.120
Article (dummy)	-0.071			-0.426***
t-value	-0.431			-3.789
Density (100 inh/km ²)		0.005		0.013**
t-value		1.15		2.522
Population (1E 07)		0.010***		0.014**
t-value		4.972		5.912
Country (dummy)		0.200*		0.191
t-value		1.881		1.425
City (dummy)		-0.165		-0.139
t-value		-1.268		-1.087
National park (dummy)		-0.019		0.030
t-value		-0.193		0.283
Expenditures (1E 07)			0.076***	-0.015
t-value			4.383	0.563
Nature (dummy)			0.109	-0.07
t-value			1.072	-0.669
Sun (dummy)			0.049	0.202**
t-value			0.400	2.177
Culture (dummy)			-0.069	0.103
t-value			0.466	0.832
R ²	0.12	0.64	0.50	0.86
N	33	33	32	32

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

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

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

is published in an article in a scientific journal, the value will be lower than when published in a paper or report. According to the values of the parameters, we may say that the output multiplier published in an article is 0.43 lower than the multiplier found in an average report commissioned by a client. Furthermore, the population density and the population size show positive coefficients with the output multiplier. In this equation, the expenditures variable has a negative sign. It is also insignificant. This indicates that the relation between output multipliers and expenditures is not easy to explain. Furthermore, in this broader context the “attraction” sun has an significant effect on the output multiplier. This is in line with what was found in an earlier similar publication (van Leeuwen et al. 2006), in which fewer tourism multipliers were included.

Looking back at the three hypotheses, we can conclude that Hypothesis 1 can be accepted; the larger the economic base, the higher the multiplier. The effect of the

size of population, as well as of the density variable is positive significant. However, second Hypothesis 2 is rejected. Although the amount of expenditures is significant when only variables related to the tourism sector are taken into account, it is not significant in the total model. Furthermore, we can accept Hypothesis 3; the longer ago the multiplier has been derived, the higher the multiplier.

2.6 Rough Set Analysis

2.6.1 Introduction

Rough set analysis was developed in the early 1980s by Pawlak (1991). The method generally serves to pinpoint regularities in classified data, in order to identify the relative importance of some specific data attributes and to eliminate less relevant ones, and to discover possible cause-effect relationships by logical deterministic inference rules (van den Bergh et al. 1997). It is essentially a classification method devised for non-stochastic information. This means that categorical information (qualitative data) can be taken into consideration. Quantitative data must first be converted into qualitative or categorical data by means of a codification (Nijkamp and Pepping 1998). However, this classification of the values of the attributes is a somewhat problematic issue in the application, as the use of thresholds implies some loss of information, and the thresholds are chosen subjectively (Bruinsma et al. 2000).

The difference between the outcomes of linear regression and rough set analysis is that the first method indicates a potential causal relationship between the dependent and the independent variable. The relationship between a decision attribute (the dependent variable) and the condition attribute (the independent variable) of the rough set analysis refers to the statistical frequency at which a certain category of the decision attribute occurs in certain categories of the condition attributes (Oltmer 2003). An important product of rough set analysis is decision rules of an “if . . . then . . .” nature. The method aims to determine which combinations of a classified set of attributes that characterize the objects are consistent with the occurrences of variation in the dependent variable or the decision attribute (Bruinsma et al. 2000).

For this analysis we aim to describe the relationship between the decision attribute, the output multiplier, and seven condition attributes. The condition attributes are first considered as one group, and then divided into three sub-groups. The first of those subgroups describes the characteristics of the information source; the so-called “meta-variables”, the second subgroup describes the characteristics of the area and the third subgroup describes the characteristics of the tourism sector. Table 2.2 shows the relevant attributes per group. Attribute classes can be found in Appendix 2.

According to van den Bergh et al. (1997), the categorization of data is seen as the most problematic issues in taxonomic experiments. For example, a loss of information of continuous variables is involved because they have to be translated into discrete ones. Another aspect of classification is that it can affect the outcomes. Different classifications can lead to different outcomes. In this study, we categorize the

Table 2.2 Attributes per group

Information source	Area	Tourism
Year of data collection	Size of population	Year of data collection
Type of documentation	Geographic entity	Kind of attraction to tourists
	Kind of attraction to tourists	Total expenditures per year
	Population density	

data according to the “equal-frequency binning”, in only two groups (Witten and Frank 2000). This method implies an even distribution of the attribute values over a predetermined number of bins, in this case two bins. As rough set analysis deals with monotonic relationships, and a significant number of our variables are ordinal in nature, the best option is to use two classes: relatively low and relatively high values. This will improve the interpretation of the results.

2.6.2 The Minimal Set of Reducts

First, we examine the minimal set of reducts together with their frequencies of appearance. The minimal subset of attributes, called a “reduct”, ensures the same quality of classification as the total set of attributes. Often, a number of reducts can be found. However, the minimal set of reducts contains no redundant information. In an optimal situation, only one reduct occurs because, the fewer possibilities for minimal sets, the higher the “predictive power” of the information (Pawlak 1991). If an attribute appears in all reducts it is called a “core” attribute. This core attribute is the most meaningful attribute and the common part of all reducts.

When analysing the relationship between the tourism output multiplier and the seven condition attributes, it appears that three of those nine are the most important ones: year of data, kind of attraction, and geographic entity. All three variables are core variables and with no other attributes apparent in the minimal set of reducts it means that there is only one reduct which has a high predictive power. It also means, that in theory, only these three variables are necessary to predict high or low multiplier values.

If, however, we derive the reducts for the separate groups of attributes, concerning the area, the tourism sector, and the information source, we find that all seven attributes are core attributes, and therefore of equal importance.

2.6.3 The Decision Rules

To obtain decision rules we use the Rose program (Predki and Wilk 1999) to calculate the basic minimal covering. We only use those rules with a strength of 2 or more. This means that the relation described in the rule appears at least twice in the

Table 2.3 Output multiplier rules when distinguishing two equal classes

Rules related to all the attributes							
Year of data	Documentation	Population	Density	Geo-graphic	Attraction	Expenditures	Multiplier
1 2		–		2			1
2	1	–		1			1
3		–		3	4		1
4		–	1	3		1	1
5 1		–		2			2
6		–	1	4			2
7		–			1		2

Rules related to meta-data			
	Year of data	Documentation	Multiplier
1	1	3	2

Rules related to the area				
	Attraction	Population	Geographic	Multiplier
1	4	–	3	1
2	1	–		2
3	2	–	4	2
4	4	–	4	2

Rules related to tourism sector				
	Attraction	Expenditures	Year data	Multiplier
1	4	1	2	1
2	1			2
3	2	2	1	2

data set, but in some cases it also appears seven times. Table 2.3 shows the decision rules for the output multipliers. For example, the first rule, when including all the attributes, means: IF the year of data attribute has value 2 and the geographic entity attribute has a value 2, THEN the income multiplier has a value 1. If we take a look at the classification of the data in Appendix 2, we can see that the decision rule can also be stated as: IF the year of data collection is after 1997, and the geographic entity is a national park, THEN the income multiplier has a value between 1.10 and 1.50.

The first part of Table 2.3, shows the rules when using all the attributes. Although year of data, kind of attraction and geographic entity are the most relevant ones,

we are also interested in the influence of the other variables in order to be able to compare the rough set analysis results with those of the linear regression. Table 2.3 also indicates that more recent data is related to lower multipliers, and that a sunny destination relates to high multipliers and a destination with a mix of attractions to lower ones. Furthermore, multipliers published in an article and dealing with cities are related to low multipliers.

The rules which only include variables related to the publication show that, when the data is older, and the multiplier is described in a conference paper, its value is higher.

The rules including the area-specific attributes do not include the population attribute. They show that regions, especially when they have no specific attraction but a mix, often have low multiplier values. On the other hand, a country with a mix of attractions is related to higher multipliers; apparently the size of the area has a stronger effect than the kind of attraction. Furthermore, the tourism multipliers tend to be higher in sunny areas. Finally, the tourism-related rules again confirm the importance of the year of data, as well as of the attraction variable. In addition, tourism-related Rules 1 and 3 (as well Rule 4 related to all attributes) implicate that higher expenditures are related to higher multipliers.

Recalling the three hypotheses described in Sect. 2.5, it appears that from the rough set analysis we can (again) accept Hypothesis 1: “the larger the economic base, the higher the multiplier”, but with less certainty. Although the size of population did not appear in any of the rules, we did find that countries relate to higher multipliers than regions or cities do. From the rough set analysis, we can also accept Hypothesis 2: Greater expenditures are related to higher multiplier values. The explanation for this can be that when the tourism sector becomes an important sector, with many visitors and expenditures, the economy as a whole is more involved with these kind of activities, resulting in higher multipliers. Furthermore, we can again accept the Hypothesis 3; the older the data from which the multiplier was derived, the higher the multiplier.

The results from the rough set analysis confirm the results from the linear regression analysis. In addition, it suggests the acceptance of Hypothesis 2 which was rejected by the linear regression analysis. However, we have to keep in mind that the method has its limitations and that it is not really suitable to draw conclusions about the complicated relationships that seem to exist (see also Fig. 2.3b) between the amount of expenditures and the tourism output multiplier.

2.7 Tourism Multipliers for Dutch Towns

The transferability of research findings is an often-mentioned problematic issue related to meta-analysis, but, at the same time, it is also one of its greatest potentials (Baaijens et al. 1997). In their study describing a meta-analysis of tourism income multipliers, Baaijens et al. state that in 1997 the transfer of existing knowledge to a similar situation had not been investigated before. Also nowadays, these

kind of studies are very rare. In the Baaijens study, an interval of plausible values of unknown tourist income multipliers is derived by using the regression equations estimated from the meta-analysis. This, of course, requires the availability of data related to the variables used in the regression analysis. In this section, we want to estimate output multipliers for six Dutch towns. Although, no information is available about the number of visitors or expenditures of visitors per town, we did find information about the expenditures of tourists in several other large Dutch cities, as well as in Zandvoort, a town located at the seaside with around 16,000 inhabitants (Gemeente Zandvoort 2004), and in Heusden a small town of 6,000 inhabitants in the south of the Netherlands (www.Heusden.nl). Together with information about the relative importance of the tourism sector in the six (case-study) towns, it is possible to estimate plausible expenditures for each of them.

With this information we can use the regression equation to estimate the multiplier values. In the next step, we will first estimate tourism multipliers with the linear regression model, and then we will calculate tourism multipliers using local input–output models. This enables us to evaluate the usefulness of the results of the meta-analysis to transfer the outcomes to a similar situation.

2.7.1 Expectations Resulting from the Meta-analysis

The meta-analysis pointed out the important factors affecting the size of tourism output multipliers. Of course, for the Dutch towns, some of the factors are more relevant than others. First of all, the meta-variables are the same for all towns. However, the year of data collection, 2003, points to lower multiplier values than the average 1.56 of the meta-analysis. In addition, the (small) size of the population of the towns, between 7,000 and 20,000 inhabitants, also suggests low multiplier values. On the other hand, the attractiveness of the towns could result in a diversification of the outcomes per town: Oudewater and Bolsward, for example, are two historic towns with more cultural attractiveness, while Nunspeet is perhaps less appealing as a town but it is located near a highly appreciated nature area, “De Hoge Veluwe” which has many recreation facilities.

Table 2.4 shows the different characteristics of the towns, relevant for the value of the tourism multiplier. All towns are considered as “a city”, except for Nunspeet which is regarded as being a national park, because most visitors stay in or close to De Hoge Veluwe. Furthermore, Table 2.4 also shows the multiplier value derived with help of the linear regression model.

According to the town characteristics, it would be expected that Schagen and Nunspeet would have higher multipliers because of their medium-sized population and the relatively large share of firms in tourism-related sectors. The municipality of Bolsward also has a relatively large share of firms in tourism-related sectors, but its population is relatively small. Given its relatively low population, its impacts on the multiplier values are small.

Table 2.4 Town characteristics and the estimated relative multiplier value of the six Dutch towns (2003)

Town	Population size town	Density (pop/km ²)	Share of firms in tourism related sectors (%) [*]	Expenditures (\$ *106) ^{**}	Attraction	Multiplier values from regression model
Dalfsen	6,570	2,900	17	20	Nature ⁺ Culture	1.08
Schagen	17,214	3,900	33	100	Culture	1.16
Bolsward	9,378	3,700	32	100	Culture	1.13
Nunspeet	19,215	3,200	27	100	Mix	1.16
Oudewater	7,745	2,800	17	50	Culture	1.09
Gemert	14,815	3,800	20	40	Mix	1.13

^{*} Retail, catering and culture/recreation sector in 2003 (Source: own calculations from CBS data)

^{**} Based on the share of firms in tourism related sectors and expenditures in Zandvoort, which is a seaside resort of 16,000 inhabitants receiving \$300*106 of tourism expenditures (Gemeente Zandvoort, 2004), and in Heusden, a small town of 6,000 inhabitants receiving \$20*106 of tourism expenditures (www.Heusden.nl).

2.7.2 Composition of Local Tourism Multipliers

To be able to evaluate the above-estimated multipliers with help of the linear regression model, we will now develop local tourism multipliers ourselves.

As mentioned in the introduction, it is important to be aware that no such thing exists as “the tourism sector” in any usual statistical definition. First of all, even sectors that are strongly oriented towards leisure activities also serve non-leisure business activities. Furthermore, different kinds of tourism require different inputs and provide different outputs. Day trippers, for example, have different expenditures than visitors who stay overnight.

According to the Dutch corporation for “Continuous Holiday Research” (Stichting Continu Vakantie Onderzoek, 2002), visitors to Dutch city-centres (day-trippers) spend on average 40% of their expenditures on shopping, 40% on catering services, and the rest, 20%, on other services.

For visitors staying overnight, it is more difficult to predict their expenditures. However, in some of the studies used for the meta-analysis, it is described how the tourism multipliers are derived. Table 2.5 shows the distribution of tourism expenditures over several sectors, as described in 7 studies. The last column shows the distribution estimated for the Dutch towns. The first two studies describe the distribution of expenditures of tourists visiting a region in Spain and Denmark. These tourists spend most of their money on accommodation, around 60%. The other studies focus on cities, of which Christchurch and Akaroa in New Zealand are the smallest and most similar to the Dutch towns. In these cities, around 30% of total expenditures are spent on accommodation, another 19–24% on shopping and around 23% on restaurants and catering. Taking all this information together resulted in the estimated distribution of expenditures in the Dutch towns. This is in line with the “general” distribution that Chang (2001) proposes in his dissertation about variation in tourism multipliers.

Table 2.5 Distribution of tourism expenditures of visitors staying overnight over different sectors, as described in 7 studies, and estimated for Dutch towns

	Galicia	Denmark		Washington		Christ-church		Akaroa		Amsterdam		Edinburgh		Dutch towns	
	Region	Island		City		City		Town		City		City		Town	
Accommodation	60	60		30		28		28		50		26		30	
Recreational Facilities	9	6		8		9		19		–		6		10	
Shopping	7	7		12		24		19		35		22		20	
Restaurants and catering	–	23		40		24		22		–		41		25	
Transport (local)	2	4		6		8		1		–		–		2	
Other	22	0		4		7		11		15		5		13	

2.7.3 Tourism Output Multipliers for the Six Dutch Towns and their Hinterland

In this thesis, we derived output multipliers for several sectors located in the six Dutch towns (by using SAM tables). The exact method was described in Sect. 2.5. However, Table 2.6 shows the type II output multipliers for the sectors which are related to tourism, and which are thus necessary to estimate a tourist multiplier.

Table 2.7 shows that, on average, the tourism multiplier for the Dutch towns is 1.13 for day trippers, and 1.14 for visitors who stay overnight. This value is relatively low, even when taking into account the small area and the year of data, but it is not implausible. In addition, Butcher et al. (2003) derive a tourism multiplier for a town of less than 1,000 inhabitants in New-Zealand (Akaroa), and that multiplier also has a value of 1.13.

The tourism multiplier values per town are quite diverse. First of all, the multiplier of Dalfsen is relatively low: only 1.08 for day trippers, and 1.10 for visitors staying overnight. But, according to the relevant factors which resulted from the meta-analysis (Table 2.4), this was expected. The estimated multiplier from the linear regression model has the same value. It was also expected that the tourism multiplier of Oudewater would be relatively low which can be confirmed by our calculations. Both towns have a small population and a low share of firms related to

Table 2.6 Estimated type II output multipliers for tourism related sectors in six Dutch towns

	Transport Services	Retail Services	Hotels and catering	Public administration and recreation*	Average of all sectors
Dalfsen	1.36	1.02	1.14	1.02	1.10
Schagen	1.42	1.24	1.16	1.09	1.20
Bolsward	1.29	1.15	1.14	1.09	1.17
Nunspeet	1.03	1.07	1.43	1.06	1.10
Oudewater	1.02	1.20	1.02	1.10	1.05
Gemert	1.04	1.04	1.11	1.02	1.04
Average	1.19	1.12	1.17	1.06	1.11

* Public administration, education, recreation and other services

Table 2.7 Tourism output multipliers for the six Dutch towns

	Day trippers	Visitors staying overnight
Dalfsen	1.08	1.10
Schagen	1.18	1.17
Bolsward	1.13	1.13
Nunspeet	1.23	1.28
Oudewater	1.11	1.08
Gemert	1.07	1.08
Average	1.13	1.14

the tourism sector. Furthermore, in line with our expectations, Schagen has a high multiplier value and Bolsward a medium one. However, the linear regression model does not predict the multiplier for Nunspeet very well. Although, the regression model does predict a relatively high multiplier value (1.16), the actual value is even higher. Furthermore, the multiplier value of Gemert is lower than was expected from the regression model. In spite of the larger population of Gemert, the actual tourism multiplier is the lowest of all the towns.

This indicates that for these small towns, the regression model predicts the multiplier values quite well, but there are some discrepancies.

2.8 Conclusions

In this chapter we have performed a meta-analysis on tourism output multipliers. The basic research question we addressed in this paper is: “Which characteristics of the documentation source, the research area, or the tourism sector affect the size of the output tourism multiplier?”

After the first analysis in which we considered average multiplier values according to relevant characteristics, a linear regression analysis and a rough set analysis were performed. Therefore we formulated three hypotheses:

1. The larger the economic base, the higher the multiplier.
2. The more visitors or expenditures of visitors, the higher the multiplier.
3. The longer ago the multiplier has been derived, the higher the multiplier.

Trying to answer the basic research question in this paper, it appears first of all that the characteristics of the documentation source do have an effect on the size of the multiplier. According to all three analyses we found that especially conference papers estimate higher multipliers than articles do. We also found that recently derived multipliers often have lower values. This can be related to the increasing openness of local economies that is characteristic of many economies nowadays.

As can be found in many other publications, it appears that multipliers for countries are higher, and so are multipliers for areas with large populations, which is consistent with the expectation that higher multiplier values are expected for larger economies. In addition, national multipliers are higher than regional multipliers, probably because country boundaries decrease import leakage (Hypothesis 1). The year of data has a negative impact, which confirms Hypothesis 3.

Seemingly, the outcomes of the rough set analysis are complementary to the outcomes of the linear regression because, besides accepting Hypotheses 1 and 3, Hypothesis 2 can be accepted as well.

Finally, we tried to transfer our findings to a similar situation: six Dutch towns. Therefore, we used the total linear regression model to predict the multiplier values of the towns, taking into account the population, density, expenditures, kind of attraction and importance of the tourism sector per town.

It appeared that the relative multiplier values for the tourism sector in six Dutch towns could be “predicted” quite well by the linear regression model. The

predicted multiplier for Nunspeet was underestimated and for Gemert overestimated by the regression model. This seems to result from the variables “nature” and “expenditures”, which are both positively related to the output multiplier, when only tourism-specific variables are included, and negatively for the total regression model. Apparently, further research on these two variables is needed in order to find out how they exactly affect tourism output multipliers.

Furthermore, both the explorative analysis and the rough set analysis showed that the amount of expenditures has an effect on the output multipliers. However, in which way is not exactly clear.

Appendix 1: Publications Used for the Meta-analysis

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Appendix 2: Attribute Classes When Using Two Equal Classes

Decision attribute	Classes		
Output multiplier			
1	1.10–1.50		
2	1.51–2.75		
Condition attribute	Classes	Condition attribute	Classes
Population	(#)	Publication	
1	0–323,000	1	Article
2	323,000–123,000,000	2	Report
		3	Conference Paper
Expenditures	(Mil. \$/year)	Attraction	
1	0–300	1	Sun
2	300–13.000	2	Nature
Density	(Inh/km ²)	3	Culture
1	0–50	4	Mix
2	51–4.000		
Year of data	(Year)	Geographic	
1	1980–1997	1	City
2	1998–2004	2	National Park
		3	Region
		4	Country/State

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