Methodology and estimation of tourism-related road toll expenditures: experience from the Slovene Tourism Satellite Accounts

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The implementation of the complex Tourism Satellite Accounts (TSA) methodology for Slovenia has posed considerable challenges in different areas of tourism statistics. Particularly, due to lack of data in some tourism areas (i.e. transit visitors, same-day visitors, etc.), various estimation methods had to be developed to fill in the gap, as it is often the case with complex socioeconomic phenomena. Within the TSA methodology, transportation-related expenditures, such as gas and road toll expenditures represent an important product and service category, often ranking among top 5 tourism expenditure categories. This is especially true for small countries like Slovenia, with strategic geographical position, making ideal transit and on-the-way tourism destinations to other top tourist destinations (i.e. Croatia). The purpose of this paper is to provide experience, estimation tools and best practices in evaluating tourism-related road toll expenditures for different visitor categories in Slovenia for the year 2006. As such, the goal of the paper is to explain, how tourism-related road toll expenditures have been estimated within the TSA methodology for Slovenia for 2006 and to outline an estimation approach, which can be used either within the TSA or individually on its own.

Keywords: Tourism Satellite Accounts, road toll expenditures, estimation tools, best practices, Slovenia

1. Introduction

According to the United Nations World Tourism Organization (UNWTO) tourism is today in 4 out of 5 world countries among top 5 national industries. Globally, in 2008, international tourism generated over 642 billion EUR of revenues and represented over 30% of world exports of services (UNWTO 2009). Yet despite its importance, in terms of its impact on both the national and world economy, evaluating tourism, because of its demand driven phenomenon, is often hard and far from being methodologically exact. While the implementation of the Tourism Satellite Ac-

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counts (TSA) methodology is today believed to be the most in-depth and wholesome quantitative evaluation of tourism on the national economy, representing also an extension of the methodological approach of the System of National Accounts (SNA), the lack of appropriate data for some tourism-related expenditures and visitor categories (i.e. transit visitors, same-day visitors, etc.) means that evaluating these selected tourism expenditures today is still as much an art, as it is science. Nowhere is this more apparent than in the area of forecasting different tourist demand components (Chu, 2008). In this context, the development of comprehensive and consistent measurement approaches to compensate for the lack of reliable and available data in tourism, also for country comparison purposes, is one of the primary motivations for the use of TSA today (Frechtling 1999, Rivera 1999, Sharma-Olsen 2005). It is because of this, that sharing best practices and outlining transparent estimation approaches is of vital importance, particularly for newcomer countries, which are implementing the TSA methodology for the first time, and face considerable estimation challenges and questions, which the TSA Methodological Recommended Framework (Eurostat 2008) does not address in sufficient detail.

In Slovenia, tourism represents *"one of the leading economic activities, with a profound impact on national economy, regional development and employment"* (SURS 2009). Thus, tourism and its economic impact must be taken into consideration from the viewpoint of state, regional and economic development (Stynes 1999). However, despite its importance, the overall impact of tourism on Slovenia's national economy begun to be evaluated only with the implementation of the TSA methodology for the year 2000 only in 2004. Having said this, considerable progress has been made for 2003 and 2006 TSA estimations in the year 2007, where several new estimation approaches have been developed to compensate for the lack of available primary statistical data in some areas.

The structure of the TSA methodology is based on measuring the complexity of tourism in a national economy, and based also on its balance between demand for tourism-related products and services on one hand, with regards to their supply on the other hand (Rašković – Zagoršek 2008). It must also be noted that tourism measurement is particularly difficult and challenging, since tourism is implicit in many different industries, but does not comprise 100% of one single industry (Sacks 2004). Having said this, the general ideas of the TSA methodology are: (1) the analysis of all aspects of demand for goods and services, wholly or partly associated with tourism within the economy, (2) the observance of the operational interfacings with the supply of such goods and services within the reference economy, and (3) the description of supply and demand sides with other economic activities (Eurostat, TSA: Recommended Methodological Framework 2008).

Within the TSA methodology transportation-related expenditures such as gas and road toll expenditures represent an important product and service category, often ranking among top 5 expenditure categories. This is especially true for small coun-

tries, with strategic geographical positions, making ideal transit and on-the-way tourism destinations, where most tourist and visitor arrivals are done by road. Indeed, Slovenia's geographic position, lying between East and West, North and South, and neighboring to Croatia, one of Europe's top summer tourism destinations makes it a popular by-car transit tourism destination. Having said this, an estimated 12 million transit cars passed Slovenia in 2006 (Zagoršek et al. 2008). In addition, close to 87% of all tourist arrivals were by-road arrivals (Zagoršek et al. 2008). This is also consistent with other research, which has shown that *"the ability of visitors to travel around destination areas is crucial for tourism"* (Dickinson-Robbins 2008).

The purpose of the paper is to provide experience, estimation tools and best practices for evaluating tourism-related road toll expenditures for different visitor categories (i.e. domestic and foreign tourists, domestic and foreign same-day visitors and transit visitors). Let us here note that the term visitor is a broader term then tourist, addressing both tourists with an overnight stay, as well as transit and same-day visitors (without an overnight stay). As such, the goal of the paper is to explain, how tourism-related road toll expenditures have been estimated within the TSA methodology for Slovenia for 2006 and to outline an estimation approach, which can be used either within the TSA framework or individually. In the first part of the paper, a brief overview of the TSA methodology is outlined, since understanding the logic and methodological structure is crucial for subsequent estimations. This is followed by an overview of the various tourism-related visitor categories for Slovenia in the second part. The third part of the paper outlines a series of 'physical flows' (i.e. number of check-ins at road-toll stations) which provide a quantitative basis for our evaluations and estimations. The fourth part outlines and describes our estimation approach to the evaluation of tourism-related road toll expenditures, followed by limitations of the research and recommendations for implementation of the estimation approach in the fifth part, followed by a short conclusion in the sixth part.

2.   A brief overview of the TSA methodology

France was the first country to start developing a methodological extension of the System of National Accounts (SNA), aimed first at evaluating the housing sector (Širše et al. 2004). By the 1970s France started to use the term *satellite accounts* for a methodological approach aimed at those accounting practices in specific horizontal areas, which were not correctly identified in the SNA, but could be approached methodologically as satellite sub-systems (Eurostat, TSA: Recommended Methodological Framework 2008).

By the beginning of the 1980s the UNWTO commissioned the preparation of Spain's tourism accounts, based on the SNA, which became one of the key documents at the UNWTO General Assembly in New Delhi in 1983 (Eurostat, TSA: Recommended Methodological Framework 2008). By 1985 Sweden was the first

country to partially implement the TSA methodology, however only for the supply side (Širše et al. 2004). By the beginning of the 1990s the Organization for Economic Cooperation and Development (OECD) began developing its Tourism Economic Accounts (TEA). In 1991 the Ottawa International Conference on Travel and Tourism Statistics held by the WTO provided a basis for the issue of Recommendation of Tourism Statistics in 1993, outlining the TSA methodology.

The first complete TSA were implemented by Canada in 1994, involving both the supply and demand sides. In 1999 the UNWTO conference at Nice presented a Conceptual framework for the TSA adopted both by the UNWTO, OECD and EUROSTAT. By the year 2000 EUROSTAT, OECD and UNWTO jointly issued the TSA: Recommended Methodological Framework, which is still in use today. In 2002 EUROSTAT issued in addition A Manual for use and implementation of TSA (Širše et al. 2004). Today the TSA methodology has started to be applied even for specific areas of tourism (i.e. TSA for the gambling industry) and for specific tourism regions, as well as providing important basis for economic policy and tourism decision making.

2.1.   *The basic idea of the TSA methodology*

As already mentioned, the TSA methodology builds on the concept of SNA, which are the most complete and extensive representation of economic processes and activities within a national economy. The TSA comprehensively analyze myriad aspects of tourism-related demand for products and services, and compares it with the supply side. This approach is underpinned by the uniqueness of tourism being very much a demand driven socio-economic phenomenon, thus mostly following an expenditure approach. In addition, TSA further evaluate how tourism-related supply of products and services further directly and indirectly impacts other economic actors, industries and activities, and thus evaluates the total impact of tourism on a national economy.

Having said this, the TSA consist of 10 individual tables, which measure the demand and supply side of (1) tourism-related products and services, (2) tourism-connected products and services, and (3) non-tourism connected products and services, indirectly tied to some extent with tourism. The TSA further explore the impact of (a) inbound domestic and foreign tourism, (b) outbound domestic tourism, and the impact of tourism on (c) employment and evaluate tourism in terms of its (d) GDP percentage, (e) employment, (f) added value, (g) capital investments, (h) fiscal revenues (taxes, social expenditures, etc.) and its impact on the (i) balance of payments. The application of TSA enables a clearer understanding of the impact of tourism on a particular economy, provides a basis for more effective and efficient eco-

nomic and developmental policies and strategies, and enables a world-wide comparison of data on tourism and its impact on various national economies.

Tables 1, 2 and 3 of the TSA represent the most important component of tourism-related demand, outlined by various types of visitor categories – the final cash expenditures. In this context Table 1 evaluates inbound expenditures by different foreign visitor categories (i.e. same-day visitors, transit visitors and tourists, spending at least 1 night in the country of reference). Table 2 evaluates domestic tourism expenditures by different visitor categories, while Table 3 evaluates outbound domestic tourism expenditures by different visitor categories. Table 4 of the TSA represents a summary of all tourism-related cash expenditures, generated by inbound and outbound, domestic and foreign visitor categories. In addition, it also takes into account expenditures in kind and tourism-related social transfers. The final result is thus internal tourism-related demand in cash and kind. This represents the basis for evaluating tourism-related share in a country's GDP and tourism-related added-value.

Table 5 of the TSA represents the supply of tourism and non-tourism related industries in the national economy. Their output is divided into (1) tourism-specific product and service categories (i.e. hotel services, food and beverage expenditures etc.), (2) tourism-connected products and services (i.e. postage, insurance etc.) and (3) non-specific products and services (i.e. fuel expenditure, retail etc.). Table 6 of the TSA summarizes the data on tourism-connected demand and supply, and adds estimates on the level of tourism-related imports and net taxes from tourism-related production. Table 7 of the TSA evaluates tourism in terms of tourism-related employment and number of jobs, while Table 10 represents an overview of selected physical tourism-related flows, such as the numbers of different visitor categories, number of overnight stays and number of arrivals. Tables 8 and 9 and seen as auxiliary tables within the TSA, and look at capital investment flows, connected with tourism.

Based on the outlined structure of the TSA methodology and its complexity, the UNWTO (2000) points to 3 important principles in the process of TSA implementation. First, a wider stakeholder support must be obtained in order to facilitate cooperation and information sharing. Second, both conceptual and organizational flexibility are needed in the process of the actual development of the TSA. It is in this area particularly, that sharing of best practices in terms of estimating specific constructs is vital and that this paper partially addresses. Third, the implementation of the TSA has a strong learning curve and should be implemented on a gradual step-by-step basis. It is in this area that the OECD (Draft OECD Guidelines for a Tourism Satellite Account 1999) emphasizes the need for establishing priorities in estimation procedures and obtaining high quality information (Sharma - Olsen 2005).

3. Relevant visitor categories for Slovenia for 2006

Since the paper address the estimation of tourism-related road toll expenditures for Slovenia for the year 2006, all relevant tourism information will be presented for 2006 as well.

3.1. A brief overview of Slovene tourism up to 2006

According to the data from the Slovene National Statistical Office (now on denoted as SURS) the most prosperous year for Slovene tourism was 1986, when Slovenia backed by a strong and 'patriotic' Yugoslav 22-milliom market recorded 2.8 million arrivals and over 9.2 million overnight stays (SURS 2009). Following Slovenia's independence in 1991 and conflicts in neighboring Croatia and Bosnia and Herzegovina, visitor numbers plummeted and began to pick up only by the mid 1990s. Since the mid 2000 the arrival of low cost airlines further increased visitor numbers, bringing visitors closer to the 1986 peak. Figure 1 displays a comparison of arrivals and number of overnight stays in the period 1950 up to 2006, while Figure 2 displays the ratio of domestic to foreign tourist arrivals and overnight stays from 1991 up to 2006.

Figure 1. Comparison of tourism arrivals and overnight stays in the period between 1950 and 2006 (in 1000)
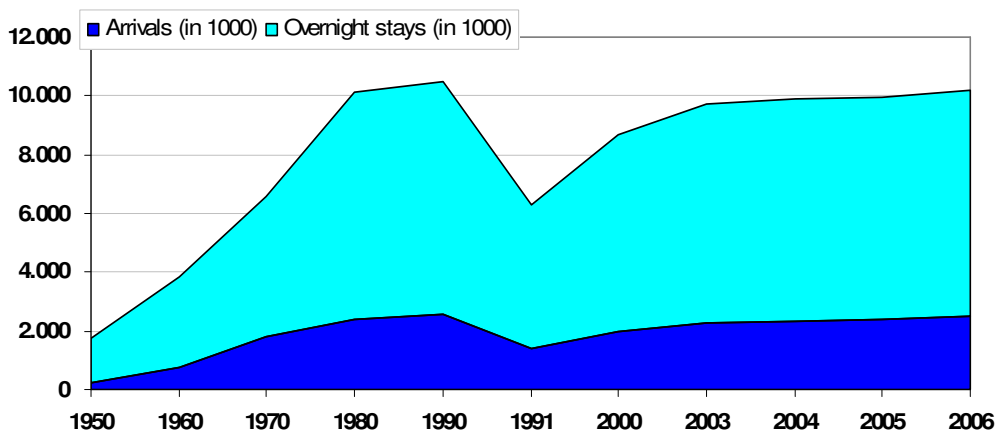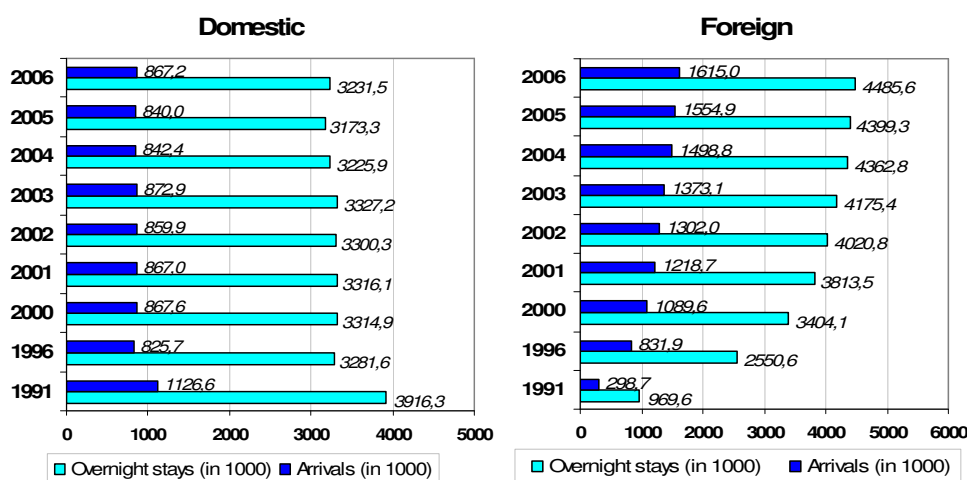

Source: SURS, Statistical Yearbook, 2007; own depiction

As the data from Figure 2 shows, the number of domestic tourist arrivals increased by more than 5% from 1996 to 2006, while the number of overnight stays fell by

around 2% respectively. In the same period the number of foreign tourist arrivals increased by 94%, while the number of overnight stays rose by some 76% (SURS, Statistical Yearbook 2007).

Figure 2. Comparison of domestic and foreign tourism arrivals and overnight stays in the period between 1991 and 2006 (in 1000)

Source: SURS, Statistical Yearbook, 2007; own depiction

With regards to the country of origin, German tourist overnight stays have decreased from 23.5% in 1995 to 13.9% in 2006, while the share of overnight stays by Italian tourists has increased from 15.9% in 1995 to 19.8% in 2006. These two groups of tourists also represent the most important tourists in terms of country of origin. In large part the increase of Italian tourists may be attributed to a ban on gambling in Italy and a thriving gambling industry in Slovenia. Hence, the gambling industry is also an important driver of same-day tourist visitors. The most prominent rise of the share of overnight stays is seen for UK tourists, whose share of overnight stays has increased almost 2.5-fold between 1995 and 2006, mostly because of low cost airlines. In addition, the share of overnight stays by US tourists has almost doubled from 1.3% in 1995 to 2.4% in 2006 respectively (SURS 2009).

3.2.   Relevant tourism-related visitor flows for Slovenia for 2006

The TSA methodology distinguishes between the following tourism-related visitor categories, which are relevant to the evaluation of tourism-related road toll expenditures: (1) *domestic tourists*, (2) *foreign tourists*, (3) *domestic same-day visitors*, (4) *foreign same-day visitors* and (5) *foreign transit visitors*. Here, a tourist is referred

as a visitor with at least one overnight stay in the country of reference. While precise statistical data is usually available for domestic and foreign tourists incurring an overnight stay, less statistical data is available for same-day and transit visitors, which most often have to be estimated, as was the case also for Slovenia.

The number of (1) **domestic tourists** is based on data from SURS (Statistical Yearbook 2007), which registered 867,200 domestic tourist arrivals and 3.2 million domestic tourist overnight stays for 2006. In addition to inbound domestic tourist trips (made almost exclusively by car) 1.9 million car trips were also made by Slovenes as tourist abroad (outbound) and starting from Slovenia (SURS, Statistical Yearbook 2007).

Multiplying these 1.9 million outbound car trips by an average of 2.8 household members, we get some 5.3 million outbound domestic tourists travelling by car. Similarly, the data for (2) **foreign tourists** is also based on data from SURS (Statistical Yearbook, 2007), which recorded 1,615,000 foreign tourist arrivals and 4,485,600 overnight stays for 2006. Applying the 87% share of incoming tourist arrivals by car, 1.4 million foreign tourists are thought to have arrived by road in 2006.

The number of (3) **domestic same-day visitors** were estimated at about 9.8 million for 2006. This estimation is based on the number of domestic same-day car trips from the Survey of tourism trips by domestic visitors for 2003 (latest possible data) commissioned by the Slovene Tourism Organization. Estimates for 2006 were based on the extrapolation of 2003 structures. Based on the Survey on tourism travels of domestic population for 2003 conducted by SURS and extrapolated for 2006, an estimated 4.1 million same-day trips were made by Slovenes, out of which 3.5 million were made by car (86.2%). Multiplying this share by the average number of household members in Slovenia (2.8 based on the last 2002 census) we get some 9.8 million by-car domestic same-day visitors.

Among all visitor categories the estimation of the number of (4) **foreign same-day visitors** (excluding transit visitors, who were estimated separately) was hardest, due to lack of systematic statistical data collection. Because of Slovenia's size and geographical position, it is a popular one-day visitor destination for many tourists from Croatia, Austria and Italy. Because they do not generate an overnight stay and usually visit just one or two top tourist attractions in Slovenia, official statistics and has not been able to develop a systematic way of their tracking. In addition, the division between same-day and transit visitors, with the latter only crossing Slovenia to their final tourist destination, makes it even harder. Having said this, based on estimates from the main tourist attractions in Slovenia and more thorough data on foreign same-day gambling visitors, which constitute a sizable portion of all foreign same-day visitors (mainly from Italy, where gambling is prohibited by law), we have estimated some 2.1 million same-day foreign visitors for 2006 (Estimation of TSA for 2003 and extrapolation for 2006, 2007). Due to the nature of same-day

tourism visits, only a negligible share (< 5%) of these visitors is thought to have arrived by non-road transport (i.e. train).

While (5) **foreign transit visitors** are sometimes grouped with foreign same-day visitors, Slovenia's geographic position and incoming visitor structure call for a division between the 2 categories. According to the survey data from SURS (Statistical Yearbook, 2007) almost 87% of all incoming tourists arrive to Slovenia by road. In addition, according to data from border crossings, an estimated 38.2 million transit visitors (tourism and non-tourism related) passed Slovenia in 2006 by car, which makes for some 12 million transit cars in 2006. Most of them in the late spring, summer and early autumn seasons, going to Croatia; one of Europe's top summer tourist destinations. Thus an estimated 65% of all individual person border crossing are thought to be transit-related (Estimation of TSA for 2003 and extrapolation for 2006, 2007).Of these transit-related visitors about 60% are thought to be tourism-related which brings us to some 22.9 million tourism-related foreign transit visitors in 2006. Table 1 in the end summarizes the presented data or estimations for all the 5 relevant visitor categories for 2006.

Table 1. Summary of relevant data and estimations for all 5 visitor categories for Slovenia for 2006

Visitor category	Number of by-car visitors for 2006
Domestic same-day visitors	~ 9.8 million
Domestic tourists	0.867 million (+ 5.3 million outbound)
Foreign transit visitors	22.9 million
Foreign same-day visitors	~ 2.1 million
Foreign tourists	1.4 million

Source: SURS, Statistical Yearbook, 2007; Zagoršek et al., 2008; own estimations

The provided data and estimations of the 5 relevant visitor categories in Table 1 was later on used to divide the total estimated amount of all road toll expenditures, among the 5 relevant visitor categories. This is described in greater detail in the next section of the paper.

4.   The methodological approach

In the next section, the paper outlines the general methodological approach adopted in the estimation of tourism-related road toll expenditures for Slovenia in 2006. In this context, a top-to-bottom approach was used in the sense that, first the cumulative share of total tourism-related road toll expenditures was estimated using a differential approach (explained in greater detail further on) and second, this expendi-

ture amount was later divided between particular visitor categories (i.e. domestic tourists, foreign same-day visitors, transit visitors, etc.).

4.1.   *Relevant input sources*

The main methodological approach to the evaluation of cumulative tourism-related road toll expenditures is based on comparing (1) physical flows from road toll stations in **tourist and non-tourist times (seasons) of year** and (2) comparing flows between **regular working days, weekends and holidays**. In all cases the difference between tourist vs. non-tourist, as well as regular work days vs. other days was corrected by a factor and attributed to tourism. Hence, the difference obtained from this comparison was then used as an input for the estimation of cumulative tourism-related road toll, as a percentage of total (tourism and non-tourism) road toll expenditures in 2006. Having said this, 3 key information sources provided the basis for our estimates.

The first information sources represented (1) **actual physical data on the number of crossings at all road toll stations** across Slovenia gathered systematically by DARS, a state-run Motorway Company of the Republic of Slovenia. All together, data was gathered from 26 road-toll stations in Slovenia, which registered almost 60 million crossings by all non-carriage vehicles (i.e. commercial trucks etc.). In this part, data was compared for first 2 classes of road toll, thus including (a) personal vehicles (toll class R1), as well as other vehicles up to 3.5 tons (toll class R2). The second information source was the so called (2) **Traffic calendar**, which displays a day-by-day classification of physical flows, with direction of flows, and classifies each day into one of the following categories: (1) low traffic density, (2) increased traffic density, (3) high traffic density and (4) very high traffic density. Figure 3 displays a short excerpt from this calendar for illustration.

Figure 3. Excerpt of the Traffic calendar for 2006, showing direction
of traffic and traffic density
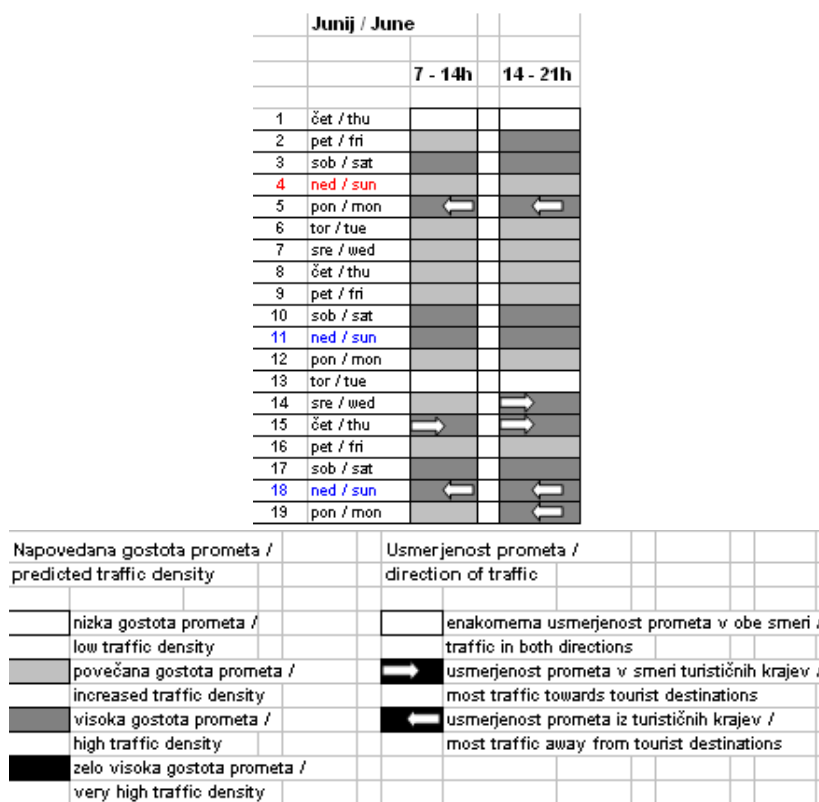
Source: DARS, Traffic calendar, 2007a

Based on this information source tourism-related physical flows were calcu-
lated as the difference (hence the differential approach) between traffic flows in dif-
ferent density periods, week days and times of year. This is explained in greater de-
tail also in Table 2.

Table 2. An excerpt from actual physical data on the number of crossings at road toll stations collected by DARS for 2006 (road toll class R1)

Date / Toll station	KOZINA	TOROVO	VRANSKO	Day	Sea-son
16. 1. 2006	912	13.632	12.087	*Monday*	NT
17. 1. 2006	935	13.585	12.535	*Tuesday*	NT
18. 1. 2006	999	13.896	12.856	*Wednes-day*	NT
19. 1. 2006	1.130	15.376	13.578	*Thursday*	NT
20. 1. 2006	1.227	17.281	16.042	*Friday*	NT
21 1. 2006	1.021	17.679	12.516	*Saturday*	NT
22. 1. 2006	1.007	14.466	10.176	*Sunday*	NT
...	**...**	**...**	**...**	**...**	**...**
24. 7. 2006	1.903	19.436	14.956	*Monday*	T
25. 7. 2006	1.622	18.297	13.587	*Tuesday*	T
26. 7. 2006	1.723	19.490	14.268	*Wednes-day*	T
27. 7. 2006	1.732	22.286	14.959	*Thursday*	T
28. 7. 2006	2.458	29.085	17.815	*Friday*	T
29. 7. 2006	3.603	33.684	20.966	*Saturday*	T
30. 7. 2006	2.591	26.346	17.467	*Sunday*	T

Source: DARS, Traffic calendar, 2007a.*NT: non-tourist season; T: tourist season

Pertaining to the excerpt data shown in Table 2, let us just point, that the classification of tourist seasons pertained to all school holidays (i.e. Christmas, Easter, etc.), as well as the annual summer holiday period between July and August. This division was also employed by DARS in their Traffic calendar. In terms of type of day (i.e. regular working vs. non-working) Tuesdays through Thursdays were classified as typical regular working days. Mondays and Fridays were not classified as regular working days, since they often hold tourists and visitors on extended weekend holidays, as well as student commuters.

The third source of data was linked to the (3) **total amount of collected road toll** by DARS in Slovenia for 2006. According to their annual report for 2006, DARS collected some 36.3 billion SIT or approximately 151.4 million EUR (DARS, Annual report 2007b). Thus, the cumulative of all tourism-related road expenditures for 2006 is shown as the percentage of all road toll collected by DARS, which is then further divided between different visitor categories based on their physical flows. The next section of the paper gives a more detailed description of the methodological approach.

4.2. Estimating the cumulative tourism-related road toll expenditures for 2006

Based on the data on road toll crossings the average number of daily crossings was calculated separately for tourist and non-tourist seasons, as well as for regular working days and non-working days. The general assumption was thus that traffic on Tuesdays, Wednesdays and Thursdays in non-tourist season is the best indicator of non-tourism related traffic. Table 3 represents a brief excerpt of the outlined comparison for regular working days in tourist and non-tourist season for illustrative purposes, and for 3 examples of different road toal stations in Slovenia.

Table 3. An excerpt from a comparison of the total number of crossings and average number of daily crossings in tourist and non-tourist seasons for regular working days (road toll class R1)

Season	Variable	KOZINA	TOROVO	VRANSKO
Non-tourist season	*Cumulative*	134,640	1,864,053	1,724,860
	Average daily	1,213	16,739	15,539
Tourist season	*Cumulative*	60,499	732,236	576,295
	Average daily	1,681	20,340	16,008

Source: DARS, Traffic calendar, 2007a; own calculations

Based on the provided average daily number of crossings in non-tourist and tourist seasons for work days depicted in Table 3, we can see sizable differences between the average number of daily crossings in tourist and non-tourist working days for the three displayed road toll stations. However, we believe that even in non-tourist work days a portion of road traffic can still be tourism-related. Having said this, Table 4 displays the calculated difference between average daily number of crossings in non-tourist and tourist seasons, where the basis for non-tourist comparisons was estimated with the help of factors. A similar approach was also used for road toll group R2.

Table 4. A comparison of average daily crossings in tourist and non-tourist seasons for <u>working days</u> (road toll class R1) and corresponding tourism-related factors

	Variable	**KOZINA**	**TOROVO**	**VRANSKO**
Non-tourist season	*Average daily*	1,213	16,739	15,539
	Tourism factor	0.2	0.25	0.25
	Factored average daily*	1,213*(1-0.2)= = 971	12,595	11,654
Tourist season	*Average daily*	1,681	20,340	16,008
Average daily difference		710	7,745	4,354
Number of working days		250	250	250
Total difference		710*250= = 177,500	1,936,250	1,088,500

Source: DARS, Traffic calendar, 200a7; own calculations

A slightly different approach was however used for non-working days[2]. Here the difference between non-tourist and tourist non-working days was estimated as the minimum number of crossings in either non-tourist or tourist seasons. This was further corrected by a selected factor (for the degree of estimated tourism) and further multiplied by the number of non-working days. The obtained estimation was then compared to the actual number of crossings on non-working days, both in tourist or non-tourist seasons. The obtained difference was used as an input in further calculations. Table 5 displays an excerpt from the estimation of tourism-related road toll for road toll class R1 on non-working days.

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[2] For this purpose 115 Saturdays, Sundays and holidays were taken into account.

Table 5. A comparison of average daily crossings in tourist and non-tourist seasons for
<u>non-working days</u> (road toll class R1) and corresponding factors

	KOZINA	**TOROVO**	**VRANSKO**
Minimum daily crossings in non-tourist season	829	11,101	9,339
Minimum daily crossings in tourist season	655	8,184	6,302
Tourism factor	0.15	0.20	0.20
Factored minimum daily crossings	655*(1-0.15)= = 557	6,547	5,042
Number of non-working days	115	115	115
Total factored crossing on all non-working days	115*557[3]= = 64,026	752,928	579,784
Sum of all crossings on non-working days (in non-tourist and tourist season)	185,685	2,057,272	1,703,755
Difference between sum of all crossings and total factored crossings on all non-working days	121,659	1,304,344	1,123,971

Source: DARS, Traffic calendar, 2007a; own calculations

In the last part, the calculated cumulative differences between tourist and non-tourist seasons for working days (Table 4) were multiplied by the average price of the road toll crossing. These prices were provided by DARS. Since the data in Table 4 is provided only for the road toll class R1 Table 6 in the next section illustrates the final calculation for working days for road toll class R1. A similar approach was also used for class R2 as well.

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[3] In the multiplication process non-rounded numbers with two decimals were used.

Table 6. An excerpt of cumulative expenditures for 3 illustrated road toll stations for working days (road toll class R1) in Slovene Tolars (SIT)

	KOZINA	**TOROVO**	**VRANSKO**
Total difference	177,500	1,936,250	1,088,500
Average price of crossing	690 SIT	380 SIT	310 SIT
Cumulative expenditures	122,500, 771 SIT	735,795,327 SIT	337,414,461 SIT

Source: DARS, Traffic calendar, 2007a; own calculations

A similar approach was also employed for the non-working days, where an additional factor was used, based on the importance of the road toll station in the commuting flows on non-working days (Mondays, Fridays and weekends). Table 7 illustrates the final calculation for non-working days for road toll class R1. A similar approach was also used for class R2.

Table 7. An excerpt of cumulative expenditures for 3 illustrated road toll stations for non-working days (road toll class R1) in Slovene Tolars (SIT)

	KOZINA	**TOROVO**	**VRANSKO**
Difference	121,659	1,304,344	1,123,971
Average price of crossing	690 SIT	380 SIT	310 SIT
Additional importance factor	0.75	0.85	0.80
Cumulative expenditures	62,958,532 SIT	421,303,112 SIT	278,744,808 SIT

Source: DARS, Traffic calendar, 2007a; own calculations

For the end, Table 8 displays the estimated cumulative tourism-related road toll expenditures based on the illustrated differential approach for all 26 road toll stations and both road toll classes (R1 and R2). Let us also point out at the end that smaller factors were used to estimate the share of tourism-related road toll in the road toll class R2, which inlcudes vehicles up to 3.5 tons, corresponding to lower shares of tourism in this vehicle category.

Table 8. Joint total tourism-related road toll expenditures for Slovenia in 2006 in Slovene Tolars (SIT)

	Class R1	**Class R2**
Working days	4,154,685,467 SIT	850,913,216 SIT
Non-working days	4,628,597,464 SIT	196,359,187 SIT
JOINT TOTAL		**9,830,555,334 SIT**

Source: DARS, Traffic calendar, 2007a; own calculations

Based on the outlined methodological approach, a joint total of about 9.8 billion SIT was estimated for all tourism-related road toll expenditures in Slovenia in 2006. This represents 27.09% of all road toll expenditures (36.3 billion SIT) collected by DARS in 2006. Such a high share of tourism-related road toll expenditures vis-a-vis all road toll expenditures may be attributed to Slovenia's central geographical position, as well as a high number of transit visitors.

4.3. Division of estimated tourism-related road toll expenditures among visitor types

In the last section, Table 9 displays a summarized disaggregation of the total estimated tourism-related road toll expenditures of 9.8 billion SIT or about 27% of all road toll expenditures for 2006 (DARS, Annual report, 2007b). The disaggregation is based on the physical flows of the 5 visitor categories. For domestic (inbound) and foreign by-car tourists, a factor of 2.5 was used to estimate their road toll expenditures, since the duration of their tourist stay lasted for several days.

Table 9. Summarized disaggregation of total tourism-related road toll expenditures according
to selected visitor categories in Slovene Tolars (SIT)

	Table 1 (foreign)	**Table 2a (domestic; inbound)**	**Table 2b (domestic; outbound)**
Same-day	335,732,822 SIT	658,777,444 SIT	327,528,707 SIT
Transit	6,665,507,034 SIT	N/A	N/A
Tourists	484,020,471 SIT	818,821,768 SIT	540,140,632 SIT
JOINT TOTAL			**9,830,555,334 SIT**

*Due to rounding up the joint total may not be the exact amount of all the disaggregated estimates according to visitor category.

As can be seen from Table 9, the biggest share (about 68%) of all tourism-related road toll expenditures is estimated to be paid by foreign transit visitors. The second biggest category is the domestic inbound tourist category (8.3%).

5. Limitations of the research and recommendation for implementation

In the absence of concrete statistical data on the level of individual visitor categories the only possible approach was the top-to-bottom approach, meaning also a higher degree of data aggregation and higher implicit error. Here, the widely advocated differential approach has received much attention in these types of tourism-related expenditure estimations. In this context, we have tried to use additional factors of considerations to take into account the relative importance of a particular road toll station (either en route to neighboring Croatia and a specific Slovene tourist destination or not). These factors were however assigned based on in-depth interviews and discretion of the estimators and should be given more consideration in the future, as well as tailored to the particular visitor structure of a given country.

Next, the distinction between pure working days (Tuesday, Wednesday and Thursday), as opposed to other working days (Monday and Friday) was an intuitive one and based on strong student and work commuting on the weekends and extended weekends (particularly relevant with students). Also, several professions work regularly on weekends, meaning there is also a share of working commuters on the weekends as well. Next, the distinction between tourist and non-tourist seasons is based solely on the Traffic calendar of DARS and thus, does not take into account i.e. older (retired) tourists and visitors that plan their trips outside peak tourist seasons.

In terms of assigning the cumulative tourism-related road toll expenditures to specific visitor categories, the assumption of tourists spending 2.5 times more on road toll, as opposed to same-day visitors and transit visitors is again in many ways a discretionary decision and should be re-examined. Furthermore, one might also argue that domestic tourists and domestic same-day visitors, having local knowledge tend to use local roads, thus avoiding strong traffic on motorways in peak tourist seasons and paying less road toll. These are just some of the key areas for future improvements of the outlined methodology.

5.1. Recommendations for implementation

With regards to specific recommendations for the implementation of the described estimation approach to tourism-related road toll expenditure estimation, the key starting point are concrete data on the number of crossings at specific road toll sta-

tions. In the absence of these physical data, which may not be available in your country, data on traffic density or traffic counting may also be used as a substitute. However, without a concrete day-by-day and all-year-around information, our estimation approach cannot be applied. We also recommend, in the first stage of the process, a thorough overview of all relevant information sources and the identification of missing data.

In the next step, applying the so called differential approach, a clear distinction should be made between tourist and non-tourist times of year (seasons). Within this context, we strongly advise also making the distinction between working and non-working days, since the issue of commuting must be dealt with. In-line with the differential approach, the difference between tourist and non-tourist days may to large part be attributed to tourism. However, we recommend the use of factors to take into account also shares of business trips and commuting with seasonal components in so called tourist seasons. Here, the applied factors should be based on assessments by experts and in-depth interviews and should have good argumentation. Also, the importance of individual road toll stations should be further considered and appropriate factors applied, since some road toll stations due to their geographical position have higher degrees of tourism-related expenditures, also on working and non-tourist season days.

Once the cumulative tourism-related road toll expenditure has been estimated, particular attention should be given to assigning appropriate shares among individual visitor categories. Here, the structure of inbound and outbound visitors is very important. Particular attention must also be given to outbound domestic tourists and visitors going by car to other tourist destinations, since some of the road toll is also spend in their home country. It must also be noted that the division between various visitor categories should be made based only on data from by-car visitors and not visitors arriving also by other modes of transport. While Slovenia may have the majority of visitors coming by road, other countries may not. In countries where car rental may also be an important aspect of tourist travel, this data should also be taken into account. In Slovenia, this was however not the case.

With regards to the distinction made between same-day visitors and transit visitors let us clearly note that the TSA methodology does not specifically call for this distinction and groups them as one category. This division has been made for Slovenia mainly because transit visitor represent such an important visitor and tourism expenditure category. For your country and making this distinction, please first consider the importance of transit visitors within all tourism-related visitors.

Last but not least, when assessing the available data on tourists and visitors understanding the structure of inbound and outbound visitor categories is essential an may have a direct impact on selecting appropriate factors in the estimation approach. Furthermore, a good understanding of how various visitor categories travel (i.e. travel modes) is also an essential component of our estimation approach. In the end, appropriate feedback should also be made to official statistics offices and col-

lectors of tourism-related statistical data, to ensure in the long run also better quality of data gathering, which would be more tailored to the needs of the TSA methodology. Here, the broader two-way stakeholder approach outlined by the UNWTO is an essential part of the TSA implementation processes, as well as the emphasized learning curve effect.

6.   Concluding remarks

As the results of tourism-related road toll estimations within the TSA methodology have shown, tourism represents or represented an important part of the Slovene road toll system, where tourism-related road toll expenditures were estimated at 27% of total road toll expenditures in Slovenia for 2006. In this context, the foreign transit visitors are the single biggest driver of tourism-related road toll expenditures. This is a direct consequence of the structure of visitors and Slovenia's central geographical position, which lies en route to Croatia, one of Europe's top summer tourist destinations.

Following a strong learning curve, the Slovene task team, commissioned by the Ministry for Economy of the Republic of Slovenia focused on developing new estimation approaches in the area of transportation-related tourism expenditures (namely gas and road toll), since they represent a significant expenditure category for Slovene tourism. Using a differential approach, which has been advocated in the estimation of other tourism expenditure areas by other countries, more insight was hopefully reached. While there is undoubtedly plenty room for fine tuning of the estimation approach, the presented approach is (based on a through overview of all possible TSA-related literature) the first transparent attempt of tourism-related road toll expenditure estimation, taking into account the complex visitor structure of a particular country.

For the end, let us just also briefly note that it comes as no surprise that the Slovene government, being very much aware of this structure and results from the 2006 TSA, decided to introduce the vignette system in the second part of 2007. First, it introduced only 2 types of vignettes, namely the 6 months vignette (35 EUR) and the 12 months vignette (55 EUR). Slovenia was severely scolded by the European Commission for introducing such a discriminating vignette system, mainly for the foreign transit visitors, same-day visitors and tourists. As a result of this, it had to re-introduce in 2008 a more diversified portfolio of vignettes, which were less discriminating against foreign visitors and tourists. While most foreign tourists and visitors today still argue that the vignette system is unfair, the price of a 10-day vignette is at par with a return trip from north to the coastline or to neighboring Croatia under the old road toll system. Still, foreign transit visitors remain the biggest payback source for the vast loans taken on by DARS to finance the completion of

the Slovene motorway system, while at the same time causing sever congestion at holiday peaks, not to mention the negative externalities of the environment.

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