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Regionalizing a Tourism Satellite Account: A top-down approach based on existing data sources

Purpose: Developing Tourism Satellite Account (TSA) at regional level is a challenging task for any country that wishes to have data for its component regions or its sub-national entities. There are numerous conceptual and methodological issues to be faced in such an endeavour. Considering data availability, particularly the lack of demand-side data at regional level, the purpose of this paper was to employ a top-down method for regionalizing TSA data in Romania at the level of its eight development regions.

Design/methodology/approach: This method is based on using multiple regional indicators and existing data sources coming from the supply side: tourism statistics, passenger transport statistics, culture statistics, administrative data, structural business survey, labour cost survey, as well as national and regional accounts.

Findings: Regionalizing TSA was obtained but restricted only to calculating the TSA aggregates at regional level.

Originality: This paper will contribute to enhancing the TSA development at sub-national (regional) level by proposing a quick top-down method based only on the existing data sources.

Research limitations/implications: The major limitation is the lack of a direct reconciliation of data between regional supply and regional demand which is actually the philosophy of any TSA.

Practical implications: The regionalization of TSA data proposed in this paper can be illustrative for countries having national TSAs and wishing to make advancements at sub-national (regional) level.

Keywords: tourism satellite account (TSA); regional tourism satellite account (RTSA); top-down approach; regionalization; regional statistics; Romania

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1. Introduction

Since tourism does not exist as a separate sector in economic statistics, particularly in the national accounts, the statistical instrument of Tourism Satellite Account (TSA) was officially proposed more than 20 years ago in order to measure in a standardised manner the tourism's contribution to the economy. In 2010 there were a total of 60 countries that embraced the TSA project at national level according to an assessment made by the World Tourism Organization (2010). Nevertheless, recently at regional (sub-national) level only 14 countries were identified in 2019 to have a regional TSA (Frenţ and Frechtling, 2020). At the same time, it has to be considered that developing TSA at sub-national (regional) level is a much more challenging issue compared with national TSA due to "differences in statistical resources and systems, in policy priorities and in technical capabilities between regions" (Dwyer et al., 2020).

In a certain perspective, one can say that, especially the literature on regional tourism satellite accounts (RTSAs) is as old as TSAs in general. The first academic paper on this issue seems to be that by Rütter and Berwert (1999). This was even before the initial official adaptation of the internationally agreed document on TSA by the World Tourism Organization (WTO) in 2001. In 1999, Rütter and Berwert proposed a pragmatic way of applying TSAs in some regions of Switzerland which was considered to be an input for establishing TSA at national level.

At institutional level, discussions on RTSAs were illustrated by Quevedo (2002), and later officially by the WTO (2005). Actually the paper of Quevedo (2002) was considered to be "the first time UNWTO referred to a regional TSA" (INRouTe, 2016). In the same year of 2002, important contributions to the topic of regionalization of TSA from the Spanish perspective (seen as a medium-term project at that time) were made by Cañada-Martinez (2002). After some years of international consultations one should also mention the 2005 WTO conference held in Iguazu Falls where a special session was devoted to "Tourism Satellite Accounts: The Regional Perspective". The central paper of this conference prepared by Jones (2005) concluded that regions should envisage a regional TSA only where there are policy needs as well as statistical systems and proper human resources.

Meanwhile, some pioneering initiatives on regional TSA were made by countries such as Norway (Braendvang et al., 2001), Canada (Barber-Dueck and Kotsovos, 2002), the United Kingdom – Wales and Scotland (Jones et al., 2003; University of Strathclyde, 2003), Spain – Andalusia (Working Group, 2004), Denmark (Zhang, 2005), Finland (Konttinen, 2006) and Australia (van Ho et al., 2008; Pham et al., 2009).

An important contribution to the topic of RTSAs was also made by Frechtling (2009) in the main paper of the 2008 UNWTO Malaga conference on "Measurement and analysis of tourism economic contribution for sub-national regions through Tourism Satellite Account". The author proposed some principles for TSA validation

and discussed three scenarios for TSA development: under the current TSA condition, under the outdated TSA condition and under the non-existent TSA condition; more precisely, when a country has a TSA, two options are considered for developing a regional TSA: (A) elaborating TSA based on input-output table of a region and (B) distributing the TSA macroeconomic aggregates among the regions by a set of indicators (p. 189). Option (B) is envisaged in this paper. However, Frechtling (2009) warned that "this approach does not produce proper TSAs at regional level, as it is inherently a modelling exercise" and used the term "Experimental regional TSA – ER-TSA" (p. 196). In this paper one wants to challenge that statement by proposing a method where national TSA data are disaggregated at the level of its component regions (sub-national entities). While the author of this paper agrees with the term ER-TSA, he suggests that the top-down approach (proposed in this paper) does produce certain TSA results at regional level that cannot be considered strictly a modelled exercise.

Meanwhile, the topic on regional TSAs has also emerged in other countries, such as Austria (Smeral, 2010), France – Reunion Island (Perrainn and Jean-Pierre, 2011), India (Pandey and Singh, 2013), Belgium – Flanders (Weekers and Maesschalck, 2014), Poland (Skalska and Dziedzic, 2014), Italy (Maresca, 2014) and Portugal – Madeira and Azores (Direção Regional de Estatística da Madeira DREM, 2019a, 2019b; Serviço Regional de Estatistica dos Açores SREA, 2018). Some RTSAs initiatives of other regions within a country should also be added, for instance in Spain – Community of Madrid, Basque country, Canary Islands (Cañada, 2013).

At the same time, it is important to include Cañada (2013) as a specific paper for regional TSA published by UNWTO which provides some general guidelines for developing a regional TSA admitting to be "experimental in character but sufficiently complete to cover the essential objectives of a TSA" (p. 30). The author stresses the importance of developing interregional origin/destination matrices for tourism consumption while recognizing the origin/destination matrices to be "one of the most difficult fields for estimating RTSA". Meanwhile, the author considers two fundamental pillars for a RTSA: regional Supply and Use Table (or a partial set of regional accounts) and the system of tourism statistics at regional level "used to move up from accounting data to the estimation of a TSA" with examples for the community of Madrid (p. 31).

Cañada (2013) named two approaches for developing a regional TSA: regionalization versus regional estimation. When referring to the first approach it is said that it "attempts to apportion territorially certain parts or variables of an available national TSA, using different indicators and methods" (p. 1); however Cañada's paper failed to provide any details on how this apportionment should be made admitting that his paper is "in line with the second approach". This second approach envisages a separate TSA for a region developed in the same manner as a national TSA; obviously, the second approach is more suitable but it is a costly exercise as it should be applied only by the regions where tourism is well developed, and moreover

where there is a strong regional administration as stated by the WTO (2005). A combination of these two approaches has also emerged, and this was well illustrated in the case of Australia (Dwyer et al., 2016), and described as a "hybrid approach (part bottom-up part top-down)".

This paper wants to additionally report about another country in the regional TSA developments around the world, namely Romania as a case study for a centralised country in terms of administrative regional affairs, and thus in the official statistical system. A new perspective is highlighted showing a method of regionalization of its TSA aggregates by using a pure top-down approach which is based only on the existing data sources. This is an evidence-based case that can serve as an example for other countries wishing to produce their own rough estimates of TSA at regional level. Needless to say, the existence of a national TSA is a precondition to talk about regionalization of a TSA, hence the author considered the "under the current TSA condition" as proposed by Frechtling (2009).

2. Methodology

Starting from 2013, TSA has been presented annually in Romania at national level by the National Institute of Statistics (INS). However, on ad hoc basis, previous experimental TSAs in Romania for the reference years 2001 and 2007 that were prepared by National Institute of Research Development in Tourism (INCDT) within some research projects carried out in the period 2003-2010 also have to be mentioned. INS publishes TSA data every year in mid-December in a specific publication also presenting detailed data (in eight tables of TSA results). The following TSA aggregates are calculated at national level in accordance with the TSA:RMF (2008) methodology: Internal Tourism Expenditure, Internal Tourism Consumption, Gross Value Added of Tourism Industries, Direct Tourism Gross Value Added, Direct Tourism Gross Domestic Product and Employment in the tourism industries.

2.1. A step-by-step approach

In order to regionalize these TSA aggregates, the following eight steps were employed:

I. Perform a general assessment of the data sources on which national TSA is based (see Appendix A in the case of Romania). The purpose is to identify the regional breakdown of the data used in the TSA compilation. In principle and if feasible, all data sources used at national level should be also employed at regional level. However, this is not a recipe for success, as many of these data sources might provide data only at national level.

II. Take the national TSA data as reference values in the process of regionalization of TSA aggregates. In essence, the top-down approach means the regional allocation of TSA data having as a starting point the national TSA.

III. Since both national and regional accounts are involved in TSA regionalization (see Figure 1), the regional accounts as a point of reference are also taken as (Cañada-Martinez, 2002).

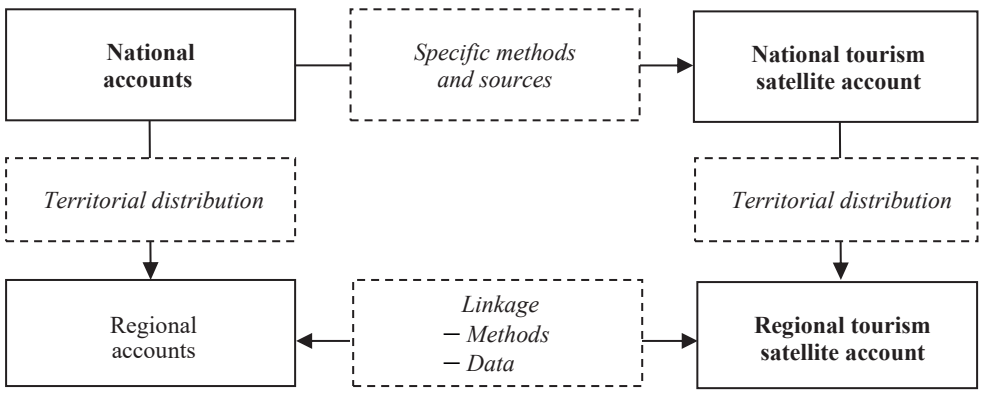

Fig. 1. Regionalization of TSA based on National and Regional Accounts.

Source: Cañada-Martinez (2002), p. 91.

It is important to mention that in Romania, developing regional accounts are mainly based on a top-down approach, while mixed methods are applied for some industries like electricity production and distribution, mining, fishery, postal services, chemical industry (INS, 2019, p. 15) – but none of these are related to tourism industries. To be more precise, the rules from regional accounts regarding the distribution of gross value added by industries and regions were also applied in the case of tourism industries (i.e. different indicators in the case of regionalizing air and rail transportation industries).

IV. Setting the general approach – regionalize each of the TSA aggregates through a specific procedure. Details on the regionalization procedure of each of these aggregates for Romania are presented in Table 1. The data sources pertaining to each regionalized TSA aggregated in Romania are presented in Appendix B.

V. Identifying regional indicators to be used to regionalize national TSA data. In this endeavour, in the regionalization process the indicators used are "as close as possible to the variable to be estimated" (Eurostat, 2013, p. 34). This method is facilitated by the existence in each region of a uniform system of data collection. WTO (2005) considers that for the top-down approach to be feasible in a country having national TSA "it is essential to have access to a set of homogeneous tourism-related regional indicators so that the national aggregates may be regionalized" (p. 23). These regional indicators were identified in Romania based on available data sources (see Table 2).

Table 1

Regionalization procedure of the TSA aggregates in Romania

TSA aggregate	Regionalization procedure
Internal Tourism Expenditure	Different procedures for Inbound tourism expenditure and Domestic tourism expenditure. Inbound tourism expenditure is regionalized at the level of total expenditure (no products breakdown) while domestic tourism expenditure is regionalized at the level of each constituent product. In the case of domestic tourism expenditure, no separation is made between overnight tourists and same-day visitors while for inbound tourism expenditure, separate estimation procedures are employed for these two segments.
Internal Tourism Consumption	Regionalization at the level of total expenditure (no products breakdown) resulted from summing the components of Internal Tourism Consumption
Gross Value Added of Tourism Industries (GVATI)	Regionalization at the level of each tourism industry based on National and Regional Accounts practice on disaggregating gross value added by each industry
Direct Tourism Gross Value Added (TDGVA)	Regionalization at the level of each industry based on domestic tourism consumption breakdowns by products
Direct Tourism Gross Domestic Product (TDGDP)	For the constituent part (i.e. Taxes less subsidies on products) the same procedure as for TDGVA will be employed.
Employment in the tourism industries	Regionalization at the level of each tourism industry

Source: own elaboration.

VI. Calculating regional distribution keys based on indicators identified in the previous step. Except for data from Family Budget Survey (for Other products category and Country-specific products category – in the case of domestic tourism expenditure), all indicators can be used to provide each year some distribution keys to be further applied to the national data. However, when employing Family Budget Survey data, in addition some disparity indexes were calculated in relation with the national level that were further used and to derive indirectly the related regionalized products (i.e. for Other products and Country-specific products). It should be noted that Romania does not have a tourism regionalized demand-side survey.

VII. Regionalizing TSA data based on the distribution keys and deriving regionalized TSA aggregates. Distribution keys are the input to regionalize TSA data. After TSA data is regionalized, the calculation of TSA aggregates at regional level is performed as a sum of its regionalized components. For instance, regionalized Internal tourism consumption is the sum of regionalized inbound tourism expenditure, regionalized domestic tourism expenditure and regionalized Other components of tourism consumption.

Table 2

List of indicators with regional breakdown used for regionalizing TSA aggregates in Romania

TSA aggregate / Component of the aggregate	**Indicators**
Internal tourism consumption / Inbound tourism expenditure	Foreign arrivals at border points (excluding airports) from citizens of the neighbouring countries (only in the case of same-day visitors) Number of arrivals of non-residents in accommodation establishments Number of overnight stays of non-residents
Internal tourism consumption / Domestic tourism expenditure	Turnover of local units
	Number of overnight stays of Romanian residents
	Number of restaurant services provided by accommodation establishments
	Number of embarked passengers in domestic traffic (by airport of origin)
	Estimated number of passengers at regional level calculated/derived from: Average revenue per train-kilometre in 2016 Number of train-kilometres operated Length of transport routes operated by trains (km)
	Number of passengers-kilometres in interurban and international road transport (only regular and occasional services taken into consideration)
	Number of passengers crossings with ferry (inland) Departures of Romanian citizens abroad by border points with ferries
	Number of visitors at museums
	Data from Family Budget Survey – category Expenditure for service payments – Payments for tourist services and COICOP category 'Other products and services'
Internal tourism consumption / Other components of tourism consumption	Number of holiday homes Number of dwellings Data from Family Budget Survey – category Expenditure for service payments – Payments for rent Number of treatment tickets supported by social insurance by spa localities Ticket price for each accommodation unit in spa localities Number of bed – places for particular accommodation establishments located in spa localities
Gross Value Added of the Tourism Industries	Expenditure for remuneration of employees (wages and salaries) Turnover of local active units Gross salaries Average number of employees Average gross monthly salary
Employment in the tourism industries	Personnel employed in active local units Personnel employed in museums at the 31th of December

Source: own elaboration.

VIII. Data validation through various checks with some related indicators (e.g. by calculating location quotients based on the tourism intensity indicator defined as the ratio between number of overnight stays and total resident population). This final step is to assure the reliability of obtained data.

2.2. Specificities of the proposed method

Overall, even if the regionalization of TSA in Romania is based exclusively on a top-down method, and what is specific is that it is based only on the existing data sources (and moreover without either a regional demand-side survey or a regional Input-Output table). However, a particularity emerges in the regionalization of Tourism Direct Gross Value Added (TDGVA). Due to the lack of regional input-output tables, there was no reconciliation between production at regional level and regionalized internal tourism consumption at the level of each tourism product/industry. Instead, each portion of tourism gross value added related to an industry was regionalized based on the distribution keys derived from the domestic tourism

Table 3

Simplified form for deriving Tourism Direct Gross Value Added

	Tourism industries				**Other industries (residual)**		**Output of domestic producers (at basic prices)**	
	Accommodation for visitors		**...**					
	Output	**Tourism share (1)**	**Output**	**Tourism share (...)**	**Output**	**Tourism share (13)**	**Output**	**Tourism share (total)**
Production (A)								∑
Intermediate consumption (B)								
Gross Value Added (C) = (A) – (B)								∑

Notes:

Internal Tourism Consumption (∑ = Internal Tourism Consumption in the country/region)

Tourism Gross Value Added (∑ = Tourism Gross Value Added in the country/region)

Source: adapted upon TSA:RMF (2008).

consumption of the corresponding product. This is due to the fact that over 80% of internal tourism consumption at national level is based on domestic tourism consumption (86.3% in 2016).

It is important to mention that in the TSA, the aggregate of TDGVA is derived from internal tourism consumption, as a result of a reconciliation between demand and supply – in fact the essence of the TSA framework (see Table 3). Moreover, it is believed that under the circumstances where there is a direct proportionality between gross value added on the one hand, and intermediate consumption and production on the other, regionalizing TDGVA in a similar manner with internal tourism consumption is fully justified (see Table 3 for a simplified representation of deriving TDGVA). It should be stated that internal tourism consumption is equal to tourism output at market prices for tourism services if imports are not considered. A somewhat similar simplified procedure for estimating TDGVA, but limited only to national level, is also found at UNWTO (2018). This confirms that the method proposed in this paper has in a way the same validity from the methodological point of view as that proposed by UNWTO (2018).

In addition, the representation from Table 3 is only illustrative and does not consider taxes on products. In fact, TDGVA (at basic prices) does not include taxes on products while Internal Tourism Consumption includes those taxes which refer to value added tax, excise duties on tobacco and alcohol, etc. Yet, in the regional accounts practice, the regionalization of taxes is carried out in a similar manner as with Gross Value Added (GVA), since by convention these taxes "are allocated on the basis of relative size of GVA of all industries in the region, valued at basic prices" (Eurostat, 2013 p. 52). Therefore, in this simplified example from Table 3, it is reasonable to assume that the issue of exclusion of taxes will not greatly influence the regionalization of the main TSA aggregates.

3. Results

3.1. The TSA aggregates at regional level

The following aggregates were calculated for each of the eight development regions of Romania (defined at NUTS 2 level), annually in the period 2011-2017:

- Internal Tourism Consumption (ITC),
- Gross Value Added at Tourism Industries (GVATI),
- Direct Tourism Gross Value Added (DTGVA),
- Direct Tourism Gross Domestic Product (DTGDP),
- Employment in the Tourism Industries (ETI).

All these are presented in Table 4 for the year 2017.

Table 4

TSA aggregates by regions in Romania in 2017

Regions	ITC	GVATI	DTGVA	DTGDP	ETI
	Millions RON				*Persons*
North-West	5,707.1	5,072.3	2,605.6	2,675.2	50,533
Centre	6,875.9	5,182.6	3,558.2	3,566.9	48,126
North-East	4,606.7	3,856.9	2,106.7	2,154.2	39,500
South-East	5,798.5	4,639.9	3,414.2	3,400.1	42,895
South-Muntenia	3,818.3	3,531.5	1,962.6	1,975.3	29,778
Bucharest-Ilfov	17,116.1	13,557.7	6,942.1	7,473.8	104,656
South-West Oltenia	1,939.7	2,394.0	962.6	979.7	25,367
West	3,693.3	3,416.5	1,644.6	1,683.8	32,219
Total Romania	**49,555.5**	**41,651.3**	**23,196.5**	**23,909.0**	**373,074**

Source: INCDT (2020).

One should note that these aggregates are in line with TSA:RMF (2008) provisions. The only minor difference is given by the lack of Internal tourism expenditure as aggregate, in this case very close to Internal tourism consumption, so it would have been somehow redundant to use both aggregates.

3.2. Components of internal tourism consumption at regional level

For each region, internal tourism consumption at regional level was calculated as the sum of three components at regional level:

- Inbound tourism expenditure,
- Domestic tourism expenditure,
- Other components of tourism consumption.

It should be kept in mind that the concepts of inbound and domestic tourism consumption are similar to those used at national level, hence there is no distinct terminology employed at the level of regions.

From an analytical perspective, one can calculate an indicator representing the level of internationalization of each region's internal tourism consumption, in other words the share of inbound tourism expenditure in total internal tourism consumption in a region (see Table 5). At national level, this share is around 15%. In the period 2011-2017, two regions (Bucharest-Ilfov and Centre) had a level of internationalization higher than the national average. At the bottom end there was South-East region where the level of internationalization was the lowest (it was only 5.9% in 2017).

Table 5

Level of internationalization of internal tourism consumption in each region, 2011-2017

Regions	2011	2012	2013	2014	2015	2016	2017
North-West	15.0%	14.1%	12.6%	12.1%	15.3%	16.4%	13.2%
Centre	24.6%	25.8%	21.5%	18.0%	19.1%	20.4%	16.9%
North-East	13.2%	11.9%	12.2%	11.6%	13.3%	14.8%	12.7%
South-East	8.2%	8.0%	7.9%	6.4%	6.0%	6.7%	5.6%
South-Muntenia	16.1%	17.0%	13.9%	9.1%	11.7%	10.5%	8.7%
Bucharest-Ilfov	24.0%	20.4%	23.1%	22.9%	21.9%	20.5%	17.6%
South-West Oltenia	8.7%	13.4%	11.3%	8.7%	11.2%	11.7%	9.8%
West	17.9%	17.9%	17.5%	15.5%	15.8%	16.8%	13.3%
Romania (national level)	**18.6%**	**17.4%**	**17.5%**	**15.9%**	**16.4%**	**16.5%**	**13.7%**

Source: INCDT (2020).

3.3. Regional tourism as a share of national tourism

Some shares from national TSA aggregates can be illustrated as regional distributions (see Table 6). These reflect the importance of regional tourism within national tourism.

Table 6

Distribution of Tourism Direct GDP by regions, 2011-2017

Regions	2011	2012	2013	2014	2015	2016	2017
North-West	11.4%	11.0%	11.4%	10.6%	11.6%	11.3%	11.4%
Centre	10.9%	11.5%	15.1%	14.8%	13.9%	13.5%	15.3%
North-East	8.8%	8.5%	8.0%	8.3%	9.4%	10.2%	9.2%
South-East	13.1%	18.3%	15.2%	15.2%	14.9%	14.4%	14.9%
South-Muntenia	6.9%	6.2%	7.4%	9.7%	8.3%	8.8%	8.8%
Bucharest-Ilfov	36.2%	32.9%	31.9%	30.3%	30.4%	30.9%	28.9%
South-West Oltenia	4.0%	3.8%	4.1%	4.6%	4.1%	4.1%	4.3%
West	8.7%	7.8%	7.1%	6.5%	7.4%	6.8%	7.3%
Total Romania	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: INCDT (2020).

For instance, one can calculate Regional Tourism Gross Domestic Product as a share of the country's Tourism Gross Domestic Product. One can see that the Bucharest-Ilfov capital region ranks first, followed by the Centre and South-East regions, while at the bottom end there are the South-West Oltenia and West regions.

Besides those, it is important to note the decreasing share of the capital region, which is in contrast with the slow increase of the share for the Centre and North-East regions.

3.4. Tourism's direct contribution to the regional economy

For each region, one can compute the tourism's contribution to the regional GDP and regional GVA since the latter aggregates are available at NUTS 2 level (in the European Union there is the Nomenclature of Territorial Units for Statistics (NUTS) system used to classify the sub-national territories at three levels which are defined according to population threshold: NUTS 1 from 3 million to 7 million residents, NUTS 2 from 800,000 to 3 million, and NUTS 3 from 150,000 to 800,000 (Eurostat, 2020b)). This shows the economic significance of tourism in the regional economy, and can also be compared with the national level (tourism's contribution to the GDP in the country). Only three regions posted levels of contributions to their regional GDP superior to the national level: South-East (4.0%), Centre (3.8%) and Bucharest-Ilfov (3.1%). The same patterns are seen in the case of DTGVA (see Table 7).

Table 7

Tourism's direct contribution to regional and national economy in Romanian 2017 (%)

Regions	GVATI	DTGVA	DTGDP	ETI*
North-West	5.3	2.7	2.6	7.4
Centre	5.9	4.1	3.8	7.5
North-East	4.8	2.6	2.4	7.3
South-East	5.8	4.3	4.0	8.4
South Muntenia	3.9	2.1	2.0	5.0
Bucharest-Ilfov	6.4	3.3	3.1	8.1
South-West Oltenia	4.1	1.7	1.5	6.7
West	4.7	2.2	2.1	5.8
Total Romania	**5.4**	**3.0**	**2.8**	**7.2**

* Based on number of employed persons taken from the Structural Business Survey

Source: INCDT (2020).

A particular case is the aggregate of Employment in the tourism industries, calculated in this table independently from national TSA data, using exclusively the indicator of number of employed persons (in local active units) from Structural Business Statistics, where activities from agriculture were excluded. One can consider this indicator as a proxy of estimating the regional importance of tourism from the labour force perspective. This situation occurred due to the fact that national TSA data does not include total employment figures for all economic activities, which would have allowed the calculation of a share of employment in the tourism

industries in total employment at national level. In addition, from a methodological point of view it would not have been correct to use total employment figures from other data sources (i.e. national accounts) since there is not the same methodology employed in the compilation of national TSA employment data. In any case, the values presented in Table 7 confirm to some extent the same hierarchy of regions in terms of their regional importance of tourism.

4. Discussion and conclusions

This paper proposes a pure top-down approach for regionalizing TSA using a set of specific indicators available at regional level. While recognizing the need to have proper tourism-related regional indicators, WTO (2005) admits that due to the specific nature of tourism and its territorial characteristic, the existence of homogenous indicators cannot always be guaranteed in advance (p. 23). Indeed, the fact that there are some homogenous indicators available for regions is not a guarantee that the regionalization process is made properly. It is always questionable to what extent these indicators are relevant, and reflect completely the tourism characteristics of a region. The latter issue was not solved in this paper. It is believed that only a different approach of regional TSA compilation (i.e. a bottom-up or a hybrid approach) is proper in such endeavour.

It is supposed that if there are no data sources specific for tourism at regional level (i.e. tourist surveys for a region) and the methods used in the regional accounts compilation in a country are developed in a top-down approach, the choice of a pure top-down approach for TSA regionalization is feasible in the lack of any other alternative.

The level of territorial disaggregation is an important aspect to be discussed. The question is to what territorial level TSA should be developed. This paper applied a pragmatic approach and used only the NUTS 2 level (as territorial level), not going deeper to NUTS 3 level. The reason for this was twofold: some supply-side data sources (i.e. structural business statistics which provides the core supply-side data in the regional disaggregation) provide data only at NUTS 2 level; the lack of any demand-side data for tourism at regional level is a serious constraint and choosing NUTS 3 level would have posed much more difficulties than NUTS 2 level. Moreover, it is considered that the proper territorial level used for a TSA cannot be established universally since a tourism destination cannot always be defined by its administrative borders (OECD, 2010).

4.1. Limitations and delimitations

An important limitation is given by the lack of any data to construct an origin-destination matrix for tourism consumption. Hence tourism expenditure between regions was not quantified properly (there was no survey capturing expenditure

neither at the place of origin nor at the place of destination). Instead, the top-down regionalization of TSA data based on properly-chosen indicators tried to eliminate this major lack. Being aware that this is far from being an accurate approach, in a pragmatic way, one must admit that it is the only solution to tackle the lack of data. Additionally, Jones at al. (2009) admitted that "national surveys are not always stratified to ensure an adequate return for each industry activity for each region" which is an important difficulty of a top-down approach (p. 305).

At the same time, the author is aware that the pure top-down approach applied in this paper complies only partially with the two fundamental pillars proposed by Cañada (2013) due to the lack of a system of tourism statistics at regional level in Romania, in particular the lack of regional demand-side data. The lack of regional SUT is another shortcoming, but this is compensated by the existence of the alternative proposed by Cañada (2013), namely "partial set of regional accounts" (p. 31) which are "with reference to the example of the European Union, the ESA regional accounts and regional system (A/N which) are confined to a limited set of accounting elements" (p. 23). As an EU member state since 2007, Romania has had such regional accounts as the country has to comply with European regulations in terms of National Accounts statistics. In other words, gross value added and gross domestic products are produced at NUTS 2 level, so the regions have these major economic aggregates already calculated.

Another issue refers to the impossibility of compiling any TSA results disaggregated by regional forms of tourism (i.e. regional inbound tourism expenditure and regional domestic tourism expenditure). It should be recalled that when speaking strictly at regional level, inbound tourism includes not only foreign tourists (non--residents for the country where the region is located), but also residents from different regions of the country of reference. Moreover, at regional level domestic tourism expenditure would refer only to the expenditure of residents of the region of reference made inside this region. However, in all the data compilation the paper used only the concepts from national level (having the same meaning as at national level) that were further disaggregated by regions.

In other words, at regional level there was no specific terminology adopted (and used) since there was no demand-side data available at regional level. Consequently, this is maybe the major limitation of the top-down approach since there was no reconciliation between domestic supply and demand at regional level which is the core *modus operandi* of any TSA. However, this reconciliation is practically impossible in the absence of regional input-output tables. Therefore, it should be acknowledged that in this case, TDGVA and TDGDP at regional level are not derived directly from this reconciliation. TSA:RMF (2008) clearly states that (at national level) these are "indicators emanating from a reconciliation of tourism consumption and supply, and their values will depend on the scope of measurement of tourism consumption that a country adopts" (p. 48). Nevertheless, in order to respect these principles to some extent, regionalization of TDGVA was made taking internal

tourism consumption at regional level (more precisely, domestic tourism consumption) as a proxy indicator used in this regionalization process. It is believed that using distribution keys coming from the regionalization of a demand aggregate (i.e. part of internal tourism consumption) is much more relevant that using the distribution keys coming from the regionalization of gross output, namely gross value added of tourism industries (this also comprises the non-tourism production). The author has to admit that the whole process is in fact simply a redistribution by regions of the national TSA aggregates using different indicators and data sources.

Nevertheless, the experimental character of the results obtained has to be always kept in mind. It was the first exercise on the TSA regionalization in Romania through a method based on assumptions applied to various data sources. Apart from tourism indicators, data coming from other related fields were integrated, most notably transportation and culture. However, these fields provide statistics that are not always designed to respond to the specificity of tourism. Put more simply, not all museum visitors can be considered tourists and not all passengers travelling have tourism related purposes. Yet, there are always some assumptions that have to be made without having the perfect statistics (i.e. assuming that long-distance travel is always part of tourism or museum visitors are mostly tourists).

INRouTe (2016) admits that in practice "it is not so easy to measure what one region produces and which part of it is consumed by visitors in another region" (p. 123). Only a specific demand-side survey carried out in each region would provide some indication about these measurements. Unfortunately, this was not the case of Romania, which lacks any tourism surveys carried out from demand side at regional level. This was a major constraint of the applied method.

OECD (2016) saw RTSA as "an irregular project and a one-off exercise" (p. 11). However, the author of this paper wanted to prove that this irregularity of regional TSA can be tackled with a method of regionalization of TSA using a top-down approach. This might have the potential to encourage other countries with national TSAs to develop a similar exercise. Finally, more TSA applications at regional level may demonstrate that there is always room for improvements and future developments in this field.

Thus, one can sum up some important delimitations of this paper:

- The lack of any direct relationship between regional tourism demand and regional tourism supply at the level of regional tourism products as this is a core part of any TSA.
- Regionalization of TDGVA aggregate at the level of each tourism industry (which is based only on domestic tourism expenditure breakdowns by products) does not in fact consider the inbound tourism expenditure. This was the case even if one is aware that there are different levels of internationalization of internal tourism consumption in each region, which can influence somehow the results. It is believed that regions that have a lower level of internationalization of tourism consumption (i.e. the South East, South Muntenia and South West Oltenia

regions) will be more accurately reflected in the regionalization process. Instead, for the regions with a higher level of internationalization of tourism consumption (e.g. Bucharest-Ilfov, Centre and West), there will clearly be a loss of accuracy. However, the magnitude of this influence is rather unknown at this moment due to the lack of any data in this field. Yet, it is assumed that since for most of the regions the level of internationalization is below 20%, thus the approach taken will not greatly influence the results.

- The issue of neglecting intra-regional tourism, since both domestic tourism expenditure and inbound tourism expenditure are defined in the same way as at national level.
- The estimation of tourism expenditure of non-residents staying in non-commercial establishments (VFR and second/holiday homes) was not envisaged since this type of expenditure is not yet estimated in the national TSA.
- As regards the accuracy of results, one should assume that our approach is far from being very accurate but the magnitude of this potential inaccuracy is indeed unknown until new data sources are developed.

4.2. Conclusion

The regionalization of TSA data proposed in this paper can be illustrative for any country that wishes to have some TSA data at sub-national level, especially for countries that are EU members or those countries that are complying with the ESA regulations on regional accounts and have already developed TSA at national level. According to Eurostat (2019) data collection, 25 EU countries (out of 28 in 2019) provide TSA data. These countries compile regional accounts data that are transmitted annually by Eurostat, so they provide a set of regional accounts data seen as statistical reference in a macroeconomic framework. This is one of the pillars mentioned by Cañada (2013), while the other pillar refers to the system of tourism statistics at regional level. Regarding the latter, in the EU there are accommodation statistics figures available at regional level (NUTS 2), as well as some statistics for transport and culture available at NUTS 2 level. Thus, a synergy between tourism statistics and other related fields (i.e. transportation, culture) should be created at regional level. This will help tourism statistics to take advantage of data coming from other related fields. This paper proved that this synergy with statistics from other related fields (i.e. transportation, culture) could be an option in the absence of demand-side data at regional level.

There will always be a trade-off between data availability and the theoretical and methodological provisions that have to be adopted. The belief is that, above all, it is important that all available data sources are examined and utilized to the maximum extent possible. This was also the approach adopted in this paper by using regionalized existing data sources not all of them coming from tourism but also from other related fields (i.e. transportation, culture). Naturally, the principles and rules of TSA and

regional accounts were envisaged throughout this process, albeit with no direct reconciliation of data between regional supply and demand. This was in fact the major compromise in the absence of specific tourism demand-side data at regional level.

Nevertheless, the paper proved that disaggregated TSA data for regions can be obtained at least at the level of the main TSA aggregates that international standards (i.e. TSA:RMF 2008) have proposed. These aggregates should be interpreted both in relation to the national levels as a share from total country's tourism economy, and in a comparative manner as contributions to the regional economy. Finally, the TSA aggregates provide very useful data in characterizing the economic importance and the size of tourism in each region. Obviously these are in fact very useful key figures used by policy-makers and any other stakeholders in a region.

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Appendix A

Data Sources for TSA Compilation at national level in Romania and Assessing the Possibilities for Regional Breakdowns

Data source	TSA tables of results	Regional breakdown of data (NUTS 2 level)	Comments
1	2	3	4
ACNER – Survey on tourism expenditure of non-residents staying in collective accommodation establishments	Table 1	No	Data is representative only at national level.
TOUR_PA – Survey on tourism expenditure of non-residents staying in private accommodation establishments	Table 1	No	There is no regional breakdown of data. However, the total expenditure by tourists (at the place of accommodation) does not reflect accurately the region where this expenditure was actually made.
ACTR – Survey on Tourism Demand of residents in Romania	Tables 2, 3, 10	No	Data is representative only at national level.
Family Budget Survey	Table 2	Partially	Although data on the structure of consumption expenditure is available at regional level, this structure is rather aggregated which is not very useful for TSA purposes. However, there is a major limitation since the destination (region) where expenditure is not required in the survey's questionnaire. All expenditure is allocated implicitly where the household has the residence.
Survey on tourist actions organized by travel agencies	Table 3	No	Since there is a cut-off sample, only national data representativeness can be guaranteed.
CHDEP – Survey on travel of employees	Tables 3, 4	No	The coverage of the survey is limited only to some institutions whose activity is difficult to be regionalized from theoretical point of view (i.e. governmental agencies, ministries).
Input-Output Table (IOT)	Tables 5, 6	No	There is no IOT for regions (only IOT for the national level).

1	2	3	4
ASI – Structural Business Survey	Tables 2, 5, 10	Yes	ASI provides data for regions (NUTS 2 level). However, only four indicators are collected at regional level: turnover, expenditure for the compensation of employees, average number of employees and investment expenditure.
AMIGO – Labour Force Survey	Tables 7, 10	Yes	Even if the sample is representative at regional level, the level of detail for industries in the survey does not allow a clear identification of tourism industries.
Balance of Payments	Table 3	No	Not applicable – by its nature Balance of Payments is only designed for national level.
The statistics of neighbouring countries Regarding day trips to Romania (mirror statistics)	Table 1	No	Some reasonable assumptions can be made depending on the location of the border crossing-points of the regions with borders.
Existent tourism accommodation establishments on 31st July	Table 10	Yes	Non-monetary data derived from the location of accommodation establishments.
Occupancy of accommodation establishments	Table 10	Yes	Non-monetary data derived from the location of accommodation establishments.
REGIS statistical register	Table 10	Yes	Indicators derived from the location of reporting units. However, REGIS does not provide detailed data for subsidiaries/branches of enterprises – only aggregated data for the headquarters of enterprises.

Source: own elaboration based on INS publications.

Appendix B

Data sources used in the regionalization of the TSA aggregates in Romania

TSA aggregate	Details of the aggregate	Data sources
Internal Tourism Expenditure	Internal Tourism Expenditure= Inbound tourism expenditure + Domestic tourism expenditure	Administrative data (border crossings counts) ACNER tourism expenditure survey for non-residents Survey on occupancy of tourism establishments Survey on the existent tourism accommodation establishments at 31st of July Structural Business Statistics Survey on museums Survey on passenger transportation at airports Survey on road passenger transportation Family Budget Survey Reports and data from Transportation authorities (e.g. Romanian Naval Authority, Railway Reform Authority)
Internal Tourism Consumption	Internal Tourism Consumption = Internal Tourism Expenditure + Other components of tourism consumption; the latter is restricted to the value of imputed rent of accommodation services in own vacation homes and social transfers in kind (subsidies for trips for medical treatment)	Estimates for Other components of tourism consumption based on: • Population and Dwellings Census • Family Budget Survey • Social Insurance Statistics • Survey on the existent tourism accommodation establishments on 31st of July
Gross Value Added of Tourism Industries (GVATI)	Only 10 tourism industries for international comparability considered	Structural Business Survey Labour Cost Survey
Direct Tourism Gross Value Added (TDGVA)		Similar with domestic tourism consumption
Direct Tourism Gross Domestic Product (TDGDP)	TDGDP = TDGVA + *Taxes less subsidies on products*	Similar with TDGVA
Employment in the tourism industries	Only 10 tourism industries for international comparability considered	Labour Cost Survey Structural Business Survey

Source: own elaboration.