VERSUS THE FIRST ITALIAN TOURISM SATELLITE ACCOUNT: THE PRODUCTION APPROACH

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Abstract

Italy is a Country with a very strong tourist vocation. In the European area it is one of the major destination and its rich tourist appeal is well known all over the world. For these reasons the construction of a Tourism Satellite Account (TSA) makes it mandatory.

In order to assess the role of tourism within the whole economic system a Tourism Satellite Account (TSA) has been implementing by Italian National Institute of Statistics (ISTAT). Any national TSA implementation process follows the guide lines drawn up by the international recognised framework, this latter submitted to the concepts, definitions, classifications, tables set and macro-aggregates of national accounts systems (SNA93, SEC95). Accordingly, the analytical potential and the breakdown level achieved by a TSA strictly depends on national account schemes and on their enhancement eventually occurred. Recently innovative methodological instruments in Italian national account system has occurred, affecting TSA compilation. Among these the adoption of an inter-sectorial framework tables, the Supply and Use Tables (SUT), completely integrated within the Italian national accounts; furthermore, the international revision of economic activities (ISIC Rev.4 and NACE Rev.2) called for a corresponding adjustment of Italian classification. As a result, the Italian national accounts now provide a much more detailed articulation about industries and products, 106 the former, 266 the latter. This brand new fanning significantly impacts on a successful TSA compilation and its capability to render the tourism sector.

This paper deals with the illustration of the methodology aimed to the implementation of TSA, in particular the production table.

The Italian approach to the compilation of the table of tourist production– so called T5 - follows a reconstruction process of data starting from the Supply-Use tables of Italian National Accounts and developing through an integrated and ordered set of worksheets whose final outputs merge into the T5's scheme.

Keywords*: National Accounts (NA); Supply and Use Tables (SUT); Tourism Satellite Account (TSA); branch of economic activity; tourism industry; worksheets.*

Executive summary: this paper describes the work that has been made at the Italian National Institute of Statistics in order to build the first Italian TSA. Its achievement is scheduled for the end of June 2012 and will be the result of an inter-institutional collaboration attended by the most important Italian institutions involved in tourism[2].

This work refers only the production accounts of tourism industries - table 5 of TSA -, implemented within the Department of Italian National Accounts.

This work is intended to explain:

- in paragraph 2 and its subsections the conceptual and methodological framework internationally drawn up, based on which this work has been developed;
- in paragraph 3 and its subsections their application in the Italian context; the sources needed; the methodology developed for the assessment of the production and intermediate consumption of tourism industries; the net valuation of package tours; the value added calculation;

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- in paragraph 4 and its subsections the structure of the integrated set of worksheets set for the automatic compilation of T5;
- the conclusions.

1 INTRODUCTION

The information produced within the standardized framework of national account SNA and ESA, although adequate for an actual rendering of several aspects distinguishing the economic system, don't allow the analysis and the outline of specific themes, for instance the role that tourism performs in the economy. In order to improve the knowledge of such specific horizontal areas, in SNA (sec. XXI, pg. 608)] is recommended the development of satellite accounts, namely those not included in the core system of national accounts but built using the methodological framework provided by the *Supply and Use* scheme (SUT) of national accounts, thus safeguarding the possibility of a joint reading of data.

On the tourist information production theme, the issue of official statistics is internationally regulated in *2008 International Recommendations for Tourism Statistics* (from now on said *IRTS:2008*); in UE area numerous Directives and Regulations set the standards for collection and production of data in tourism field[3]. The *2008 TSA: Recommended Methodological Framework* (from now on said *TSA:2008*) draws up the guide lines for a TSA implementation, as a result of considerable efforts in summarizing the existing regulations and harmonizing them with the international [SNA] and European [ESA] national accounts schemes. This work is based on the *IRTS:2008*'s and *TSA:2008*'s recommendations, according to the ESA in force in EU area.

Within the UE area, due to the evidence of a steady growth trend in tourism, both in its quantitative aspects (number of trips, arrivals, overnight stays, tourism expenditure), and in qualitative ones (massification of tourism, widening and diversification of the demand for tourism services, development of niche tourism types), it has appeared, along the years, increasingly defined the awareness of the role of tourism on economy and employment. As a result, many UE Member's States has been urged towards the research and the development of instruments by means of which carry out a deep and transversal analysis of tourism sector. Among such tools, a TSA implementation has been regarded as a privileged way.

In Italy, in the years 2003-2004 was draft a project to examine the feasibility of applying the principles of satellite accounting to tourism. However, estimates of Italian national accounts were still based on the scheme of input-output tables, therefore following a homogeneous branches' logical. Therein, it was prevented a correct evaluation of tourism industry according to the TSA requirements. The adoption of Supply and Use tables (SUT) within Italian NA's scheme, between 2005 and 2006, guaranteed the development of the methodology for a TSA smooth implementation.

This work is part of the implementation process for a prototype Italian TSA. Therein, it refers to the tourist industries' production evaluation, Table 5 of TSA (from now on said T5), developed using the SUT structure.

From a methodological point of view, the close link between the core system of national accounts and that envisaged by TSA structure represents a mutual strength. On the one hand, the T5's compilation strictly depends on the SUT's schemes. On the other, the implementation of satellite account a represents a valuable opportunity to test the accuracy of core ones, due to its demand of a thorough and detailed data.

The final result of this work is the implementation of a methodology of assessment for the production of tourism sector and, as a consequent, an integrated and automated set of worksheets, built using the matrices of production and of intermediate consumption provided by SUT. For each tourism industry the production's and the intermediate consumption's was estimated; such cognitive patrimony converge in an overall matrix calculated for the entire tourism sector.

In each worksheet the output, namely an estimated data, is automatically produced, starting from the information base. Their sequence construction is thought to make the output of those upstream as an input

[3] 95/57/EC; 1999/35/EC; 692/2011; 1051/2011. For details see references.

for those downstream. T5, situated at the end of the succession of worksheets, is automatically processed for any years. Additional worksheets for the calculation of economic indicators was realized.

The acronyms used in this paper are listed below:

CPC: Central Product Classification;

IC and P2: Intermediate Consumption;

ISIC: International Standard Industrial Classification of All Economic Activities;

FC: Final Consumption

GDP: Gross Domestic Product

NA: National Accounts;

P1: Production;

PT: Package tour;

SBS : Structural Business Surveys;

SUT: Supply and Use Tables;

T5: Table 5 of TSA;

TA: Travel Agent;

TO: Tour Operators;

TSA: Tourism Satellite Account;

VATI: Value Added of Tourism Industries.

2 TOURISM SATELLITE ACCOUNT

A TSA implementation implies a detailed analysis of all aspects of demand for good and services which might be associated with tourism; the establishment of the actual interface with supply of such goods and services within the economy of reference; the highlighting of how this supply interacts with other economic activities, using the SUT as reference and defined within the NA's scope (*TSA2008*, pg.2).

In this sense, the information produced by a TSA provides relevant cognitive elements allowing to evaluate:

- the share of tourism sector on the overall economy, in terms of value added and GDP, namely the national accounts' main aggregates and privileged indicators for analysis and comparison;
- tourism consumption, a TSA' s key indicator. It consists of (*TSA2008*, pg.16. par.2.25):
    - the amount paid for the acquisition of consumption goods and services, as well as valuables for own use of to give away, for and during tourism trips;
    - services associated with vacation accommodation on own account;
    - tourism social transfers in kind and other imputed consumption.

    The ratio between tourism consumption and supply allow to assess the actual dimension of tourism sector, in terms of tourist value added and gross domestic product;
    - tourism industries' production, intermediate consumption, employment and gross fixed capital formation;
    - the relationship between qualitative elements (number of arrivals, overnights, length of stay, purpose of trip) and economic and employment ones.

From a methodological point of view, a TSA compilation implies, first of all, a new outlining of the boundary of tourism's sector, meaning the need to substitute the scope of a national accounts' analysis – namely oriented towards the issue of accounts by institutional sectors and by branch of economic activity, according to the rules internationally established – in order to permit the study and the rendering of a new economic sector – tourism - , involving different kind of areas of interest.

To this end, the next two paragraphs will be dedicated to the definition of tourism sector's scope, and to the description of the international standards used to classify it in activities and products.

2.1 Basic concepts and definitions of tourism sector

The structure and the consistency of tourism industry strictly depends on the qualitative and quantitative elements performed on the demand side, thus differing from other economic sectors. In this sense tourism refers to the activities of visitors, and their role in the acquisition of goods and services (*TSA2008,* par.1.1, pg.1). As a result of this general definition, the explanation of some basis concepts is required. As pointed out in (*IRTS2008*, par. 2.9, pg 10, and par.2.21, pg.12):

- *visitor* is a traveller taking a trip to a main destination outside his/her usual environment, for less than a year, for any main purpose (business, leisure or other personal purpose) other than to be employed by a resident entity in the country or place visited;
- *usual environment* is the geographical area (though not necessarily a contiguous one) within which an individual conducts his/her regular life routines.

In its turn, visitor concept is breakdown as follows:

- *tourist:* if he/her overnights in the visited place;
- *excursionist:* when he/she doesn't overnight.

A core oriented-demand analysis aims outlining the tourism consumption concept, as defined in the previous par. 2, already said the crucial indicator to actually measure the tourism's size on the demand side.

From the perspective of supply, the object is to describe the productive activities that provide the goods and services that visitors acquire. Against this background, tourist consumption concept results once again relevant for a correct recognition, both of activities and of products.

In (*IRTS2008,* pg.46 par. 5.10) tourist products are distinguished as follows:

- *characteristics*: those that satisfy one or both of the following criteria:
    - tourism expenditure on the product should represent a significant share of total tourism expenditure (share-of-expenditure/demand condition);
    - tourism expenditure on the product should represent a significant share of the supply of the product in the economy (share-of-supply condition). This criterion implies that the supply of a tourism characteristic product would cease to exist in meaningful quantity in the absence of visitors.
- *connected*, their significance within tourism analysis for the economy of reference is recognized, although their link to tourism is limited worldwide. Consequently, lists of such products will be country-specific.

Similarly, the borders of economic activities are drawn on, according to the nature of their main production: characteristic or specific one.

2.2 The international classification of tourism products and activities

The classification of TSA's products and activities is taken from the respective international ones - ISIC and CPC – compulsorily acknowledged by Countries for the compilation of their national accounts. Both

encodings are completely compatible the one with each other: each level of the former allows to identify the corresponding level of the latter (Table 1). This feature is essential for national accounts' achievement according to the scheme of SUT.

Table 1- Correspondence between the international classification of products and activities.

CPC- Central Product Classification - Ver. 2		Italian Product classification - CPA		ISIC– International Standard Classification of all Economic Activities - Rev. 4		Italian Classification of all Economic Activities - Ateco[4]	
Section	1digit	**Section**	1digit	**Section**	Letter	**Section**	Letter
Division	2 digits	**Division**	2 digits	**Division**	2 digits	**Division**	2 digits
Group	3 digits	**Group**	3 digits	**Group**	3 digits	**Group**	3 digits
Class	4 digits	**Class**	4 digits	**Class**	4 digits	**Class**	4 digits
Sub-class	5 digits	**Category**	5 digits			**Sub-class**	5 digits
		Sub_category	6 digits			**Sub-category**	6 digits

In (*IRTS2008*, pg.48) is provided a list - Table 2 – of products and corresponding activities to be considered as tourism characteristic worldwide and for which detailed international comparisons has sought. The first 10 categories, both for products and for activities, comprise the core for international comparison. The two others are *country-specific*, for which the attribute of *characteristic* is not recognized at a generalized basis, thus falling outside the scope of international comparison.

Table 2 - List of categories of tourism characteristic consumption products and tourism characteristic activities (tourism industries).

Products	Activities/Industries
1. Accommodation services for visitors	1. Accommodation for visitors
2. Food and beverage serving services	2. Food and beverage serving activities
3. Railway passenger transport services	3. Railway passenger transport
4. Road passenger transport services	4. Road passenger transport
5. Water passenger transport services	5. Water passenger transport
6. Air passenger transport services	6. Air passenger transport
7. Transport equipment rental services	7. Transport equipment rental
8. Travel agencies and other reservation services	8. Travel agencies and other reservation services activities
9. Cultural services	9. Cultural activities
10. Sports and recreational services	10. Sports and recreational activities
11. Country-specific tourism characteristic goods	11. Retail trade of country-specific tourism characteristic goods
12. Country-specific tourism characteristic services	12. Country-specific tourism characteristic activities

The objective of this work, namely T5's achievement, is exclusively focused on the first 10 categories' evaluation.

3 METHODOLOGY FOR EVALUATION OF ITALIAN TABLE OF TOURIST PRODUCTION - T5

T5 relates to the production accounts of tourism industries and other industries. Therein, the provision of tourist good and services is traced. From this point of view, namely on supply side, this work is envisaged, both referring to the activities and to the products belonging to tourism boundary.

The process of preparing the information necessary for supporting the T5 fulfillment was developed step by step. Namely:

[4] Referring to the revised Ateco2007

- recognition of international requirements - *IRTS2008* and *TSA2008* - and their concrete application within Italian context;
- analysis of available sources (SUT; basic statistic deriving from SBS, administrative sources);
- assessment of tourism industries' production;
- net valuation of package tours;
- assessment of intermediate consumption and value added;
- automated fulfillment of T5 by means of a set of integrated worksheets.

3.1 The application of international classification's requirements within the Italian context

As shown in the previous Table 1 the international classifications of economic activities and products are perfectly acknowledged in Italy up to the 4 digits level.

The approach for a precise identification of tourism activities and products, as listed in Table 2, was a *bottom-up*: they was traced starting from the highest possible level of detail provided by SUT structure and by SBS statistics, following as possible as international recommendations. In one case the application of international manuals was partial only, due to the specific Italian correspondence between economic activities and products. Moreover, some special issues required flexibility in applying international correspondence between economic activities and products, leading to include in T5 kind of productions, or part of them, not directly considered tourist in (*IRTS2008*).

3.1.1 The supply reconstruction from the activities perspective: from the accounting concept of branch to the tourist industry's one.

Against this background it should be mentioned the principle pointing out that "*tourism industry is composed of all establishments whose main activity is a particular tourism-characteristic activity and which serves visitors directly*" (*IRTS2008*, par.6.16, pg.55), based on which a correct definition of the tourism activities' boundary was defined. The criterion of selection for main activity is the same the guides the classification of economic activities, that in NA tables are grouped in braches of economic activity. Accordingly, the level of detail of Italian SUT allowed to extract, with relative easily, from the NA scheme, those branches containing tourist activities.

However, the branch of NA, even if inclusive of tourist activities, hardly ca be entirely overlapped to tourism industry differing the scope of TSA, and which consists in grouping of tourist activities. Therefore, after a first screening of the accounting branches, their analysis was developed in three different steps:

- breakdown of each branch in *classes* of economic activity – see column 2 Table 3;
- exclusion of all those *classes* in accordance with the NA's grouping concept but not relevant for the TSA's industry one – see column 3 Table 3;
- reconstruction of the industry by means of a new criterion of grouping, based on the selection of the tourist *classes* – see column 4 Table 3.

Table 3 shows as the overlapping between *industry* and *branch*, in terms of number of *classes*, is not common. Moreover, the two groupings are based on different logics, often preventing a 1:1 correspondence.

Table 3 – Composition of tourist industries from Italian NA's structure.

Selected branches from Italian NA for T5's achievement	ISIC. REV. 4 – *classes* included in the selected branches	ISIC. REV. 4 – *classes* included in tourist industries	T5 tourist industries
1- Accommodation	5510-5520-5530-5590	5510-5520-5530-5590	1- Accommodation for visitors
2- Buying and selling of real estate and real estate activities for third parties	6810-6830	6810-6830	
3- Rental and management of properties owned or leased	6820	6820	
4- Food and beverage serving activities	5610-5621-5629-5630	5610-5629-5630	2- Food and beverage serving activities
5- Railway transport	4910-4920	4910	3- Railway passenger transport
6- Other land passenger transport	4931-4932-4939	4932-4939	4- Road passenger transport
7- Maritime and inland water transport	5010-5020-5030-5040	5010-5030	5- Water passenger transport
8- Air transport	5110-5121-5122	5110	6- Air passenger transport
9- Renting and operating leasing activities	7711-7712-7721-7722-7729-7731-7732-7733-7734-7735-7739-7740	7711	7- Transport equipment rental
10- Services activities of TA, TO and related reservation services and activities	7911-7912-7990	7911-7912-7990	8- Travel agencies and other reservation services activities
11- Creative, arts and entertainment activities	9001-9002-9003-9004	9001-9002-9003-9004	9- Cultural activities
12- Libraries, archives, museums and other cultural activities	9101-9102-9103-9104	9102-9103-9104	
9- Renting and operating leasing activities	7711-7712-7721-7722-7729-7731-7732-7733-7734-7735-7739-7740	7721	10- Sports and recreational activities
13- Lotteries, betting and casinos related activities	9200	9200	
14 – Sports, amusement and recreation activities	9311-9312-9313-9319-9321-9329	9311-9319-9321-9329	

3.1.2 The supply reconstruction from the products' perspective

From the products' perspective the main focus is on "*those goods and services directly acquired by visitors that are part of individual consumption expenditure incurred by households*" (*IRTS2008*, par.5.2, pg.44).

Once more the level of detail of SUT permitted their detection in the context of NA and their extrapolation for the TSA's purposes. Unlike that for activities reconstruction, products' one suffered from the lack of information base, thus preventing the breakdown of grouping of accounting products for any level of their classification.

Moreover, reference should be made to the principle that "*the output of tourism industries might not consist exclusively of tourism-characteristic products, and the output of other non-tourism industries may include some tourism-characteristic products*"(*IRTS2008*, par.6.20, pg 56). In SUT'S structure for any branch is

envisaged its main and secondary production. Starting from a cross-analysis product/branch at a NA level, emerged that the tourism productions, main and secondary, are entirely attributable to the branches extracted from NA for the T5's achievement.

For any tourism industry was quantified the whole production: both main and secondary.

Table 4 Composition of tourist products from Italian NA's structure

NA selected products	T5 products
1- Hotel services and similar	1- Accommodation services for visitors
2- Other accommodation services	
3- Sale of real estate services with own property made services	
4- Real estate services for third parties	
5- Administration services and property management for third parties	
6- Real residential housing services	
7- Imputed residential housing services	
8- Food and beverage sales services	2- Food and beverage serving services
9- Interurban railway passengers transport services	3- Railway passenger transport services
10- Other land passenger transport services	4- Road passenger transport services
11- Shipping, cabotage and inland water passengers transport services	5- Water passenger transport services
12 - Air transport services of passengers	6- Air passenger transport services
13- Services of renting and leasing of consumer goods for recreation and leisure	7- Transport equipment rental services
14- TA services	8- Travel agencies and other reservation services
15- TO services	
16- Other reservation service and related services	
17- Library, archives, museums and other cultural services	9- Cultural services
18- Creative, art and entertainment services	10- Sports and recreational services
19 - Services relating to gambling	
20- Management services of sports arenas and sports facilities	
21- Sports entertainment and recreation services	

In the following Table 5 is envisaged the Italian's application of the correspondence between the national classifications of economic activities and products, referring exclusively to those selected for tourism scope and elaborated in a matrix format reproducing the grouping of economic activities (branches) and the products as provided by the Italian NA's tables.

Table 5 - Correspondence between Italian tourist branches of economic activities and products.

	Branches of economic activities													
Products	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	x													
2	x													
3		x												
4		x												
5		x												
6			x											
7			x											
8				x										
9					x									
10						x								
11							x							
12								x						
13									x					
14										x				
15										x				
16										x				
17											x			
18												x		
19													x	
20														x
21														x

Branches and products are numerically ordered according to the listing shown in Table 3 and Table 4.

3.2 Recognition of data sources

The SUT are the primary data source for the implementation of T5. They consist in matrices breakdown by branch of economic activity and by product. Therein, a detailed picture is displayed about: the supply of goods and services, both of internal and of imported origin; the use of goods and services for intermediate and final consumption; the components constituting the value added generated by the braches. At a national level of analysis they highlight the connection between economic activities and products, by means of the description of internal production's processes and products' related transactions.

More specifically, production and intermediate consumption matrices provide data by branch and by product. Accordingly, an accurate outlining of tourism industry strictly depends on the level of detail of the available SUT. In Italy SUT are produced at a high level of detail. For the purpose of this work it has been possible to dispose of information referring to production and intermediate consumption by 106 branches of economic activities and by 266 items of products. In Table 6 is shown a simplified matrix of production, according to the level detail envisaged in Italian SUT's structure.

Table 6 – Simplified scheme of NA's production matrix

	Branches of economic activity						
Products	**1**	**2**	**…**	**i**	**…**	**106**	**Total**
1	$p_{1.1}$	$p_{1.2}$	…	$p_{1.i}$	…	$p_{1.106}$	$\mathbf{P_{1.}}$
2	$p_{2.1}$	$p_{2.2}$	…	$p_{2.i}$	…	$p_{2.106}$	$\mathbf{P_{2.}}$
…	…	…	…	…	…	…	**…**
j	$p_{j.1}$	$p_{j.2}$	…	$p_{j.i}$	…	$p_{j.106}$	$\mathbf{P_{j.}}$
…	…	…	…	…	…	…	
266	$p_{266.1}$	$p_{266.2}$	…	$p_{266.i}$	…	$p_{266.106}$	$\mathbf{P_{266.}}$
Total	$\mathbf{P_{.1}}$	$\mathbf{P_{.2}}$	**…**	$\mathbf{P_{.i}}$	**…**	$\mathbf{P_{.106}}$	**P..**

However, the building of the boundary of the production and intermediate consumption (IC) of tourism industries required additional basic data sources. Namely:

- information base on *market* component's production and IC, available by *class* of activity, deriving from SBS[5];
- NA's employment data, available at 5 digits level, corresponding to the *category* of Italian Ateco;
- information base on *non market* component's production[6] (General Government), available at 5 digits level, corresponding to the *category* of Italian Ateco;
- data concerning household final consumption;
- administrative source.

3.3 Evaluation of tourism production

In most cases, availability of basic data on *market* component's production by *class* of activity allowed an accurate estimate of the tourist part. Whereas higher level of detail needed, employment's basic data was used, provided at 5 digits level of the Italian's classification of economic activity, as an indicator for splitting the tourism production of *class*. In one case the lack of basic data up to the 6 digits of the previously mentioned classification resulted in the inability to exclude that part of production related to non-tourist activity emerging exclusively at that level of detail. For the *non market* component's production data at 5 digits level was at disposal.

The methodology below explained refers exclusively to the *market's* component.

With reference to the previous Table 6, for each tourist industry, grouped as shown in Table 3, the tourist part of production was estimated, through a cross-analisys branch/product made using NA's matrix, as envisaged in the below Table 7. Therein, the two highlighted examples of breakdown of the accounting branch refer, the first, to one entirely tourist (e.g. "*Services activities of TA, TO and related reservation services and activities*), the last, to one partially tourist (e.g. "*Renting and operating leasing activities"*).

Table 7 - Simplified matrix of production in a TSA's perspective.

CN products	**NA branches of economic activities**											**Total**
TSA products	**NA selected branches for T5's scope**											
	1	2				**i**	n				**N**	
		C_1	C_k	C_S	Σ		C_1	C_k	C_S	Σ		
1	p_{11}	$_{(b2)}p_{11}$	$_{(b2)}p_{1k}$	$_{(b2)}p_{1S}$	p_{12}	p_{1i}	$_{(bn)}p_{11}$	$_{(bn)}p_{1k}$	$_{(bn)}p_{1S}$	p_{1n}	p_{1N}	$p_{1.}$
2	p_{21}	$_{(b2)}p_{21}$	$_{(b2)}p_{2k}$	$_{(b2)}p_{2S}$	p_{22}	p_{2i}	$_{(bn)}p_{21}$	$_{(bn)}p_{2k}$	$_{(bn)}p_{2S}$	p_{2n}	p_{2N}	$p_{2.}$
…	…	…	…	…	…	…	…	…	…	…	…	…
r	p_{r1}	$_{(b2)}p_{r1}$	$_{(b2)}p_{rk}$	$_{(b2)}p_{rS}$	p_{r2}	p_{ri}	$_{(bn)}p_{r1}$	$_{(bn)}p_{rk}$	$_{(bn)}p_{rS}$	p_{rn}	p_{rN}	$p_{r.}$
j	p_{j1}	$_{(b2)}p_{j1}$	$_{(b2)}p_{jk}$	$_{(b2)}p_{jS}$	p_{j2}	p_{ji}	$_{(bn)}p_{j1}$	$_{(bn)}p_{jk}$	$_{(bn)}p_{jS}$	p_{jn}	p_{jN}	$p_{j.}$
m	p_{m1}	$_{(b2)}p_{m1}$	$_{(b2)}p_{mk}$	$_{(b2)}p_{mS}$	p_{m2}	p_{mi}	$_{(bn)}p_{m1}$	$_{(bn)}p_{mk}$	$_{(bn)}p_{mS}$	p_{mj}	p_{mN}	$p_{m.}$
M	p_{M1}	$_{(b2)}p_{M1}$	$_{(b2)}p_{Mk}$	$_{(b2)}p_{MS}$	p_{M2}	p_{Mi}	$_{(bn)}p_{M1}$	$_{(bn)}p_{Mk}$	$_{(bn)}p_{MS}$	p_{Mn}	p_{MN}	$p_{M.}$
Total	$p_{.1}$	$_{(b2)}p_{.1}$	$_{(b2)}p_{.k}$	$_{(b2)}p_{.S}$	$p_{.2}$	$p_{.i}$	$_{(bn)}p_{.1}$	$_{(bn)}p_{.k}$	$_{(bn)}p_{.S}$	$p_{.n}$	$p_{.N}$	$p_{..}$

C= class of economic activity

For each *class* of economic activity (from now on said *class*) included in the selected branches of NA aiming at the T5's achievement, start point is the information base deriving from SBS. The total amount by branch obtained as the sum of the production of each class is not yet the value shown in table of production derived from NA, this latter being the final result of the balancing procedure with the consumption – *Use* – and the

[5] *Market* production is defined as that referring to goods and services for sale, mostly inclusive of products sold at economically significant prices.

[6] *Non market* production is defined as that referring to goods and services not for sale, mostly inclusive of products free of charge or sold at non economically significant prices.

former still a basic data. However, the production value by *class* provided the weight for the corresponding *class* within its branch of reference.

It can be written as:

P.., the overall matrix production, 266 products*106 branches ;

$P_{.i}$ the total balanced production value of the generic i-th branch;

$\sum_{k=1}^{S} {}_{(bi)}\widehat{p}_k = \widehat{P}_{.i}$ the pre-balanced production value of the generic i-th branch, for k:1,…..S number of *class* included in the branch;

the weight of the production of the generic k-th *class* within its branch of reference is given as:

$$ {}_{(bi)}x_k = \frac{{}_{(bi)}\widehat{p}_k}{\widehat{P}_{.i}} $$

where obviously $\sum_{k=1}^{S} {}_{(bi)}x_k = 1$

Such weighting structure, applied to the balanced total production of the branch, led to a new balanced level of production by *class,* given by:

$$ {}_{(bi)}p_k = {}_{(bi)}x_k * P_{.i} $$

now being $\sum_{k=1}^{S} {}_{(bi)}p_k = P_{.i}$

In this way the result reflects, on the one hand, the weighting structure of the production by *class*, as derived from SBS basic data - ${}_{(bi)}x_k$ - ; on the other, benefits of the balancing procedure (used in NA to guarantee the equality accounting achievement) as a result of the weighting of basic data, by *class*, with the total amount of the production provided by NA - $P_{.i}$

In order to evaluate the production of tourism *industries*, but not yet for the final compilation of T5, a selection of *classes* only tourist has been made. Appropriately grouped and summarized, such classes define the total production for each tourism industry:

$\sum_{t=1}^{s} {}_{(bi)}p_t = P_{(Ii)}$, for t:1,…..s number of tourist *classes* included in the i-th selected branch, thus becoming a tourist industry.

In the production by *class* it doesn't figure its breakdown by *product*. In order to quantify the production data also from this perspective a second weighting structured appeared necessary. As previously mentioned,

the lack of basic data on production by *product*, for any level of its classification, led to its implementation using the articulation provided by NA's tables.

In particular, given the production value of the generic j-th product of the i-th balanced branch, and given $P_{.i}$ the total amount of its production, the weight by product can be written as:

$$_{(bi)}x_j = \frac{_{(bi)}p_j}{P.i}$$

allowing to estimate the production value by *class* breakdown by *product,* given as:

$$_{(bi)}x_j * _{(bi)}p_k = _{(bi)}p_{kj}$$

Finally, for T5's achievement a selection of productions relative to *classes* only tourist and to *products* only tourist has been made, which sum represents the tourist production of tourism industry:

$$\sum_{t=1}^{s}\sum_{r=1}^{m} {}_{(bi)}p_{tr} = Pt_{(Ii)}, \text{ for r:1,....m = number of tourist products.}$$

As simplified in Table 8, the original NA's production matrix – see Table 6 - is now emptied of all components not included in tourism sector.

Table 8 –Tourist matrix of production rendered in a NA matrix structure.

TSA products	**Tourism Industries**									**Total**
	C_1	C_i	C_s	$\sum = I_1$	...	C_1	C_i	C_s	$\sum = I_n$	
1	p_{11}	p_{1i}	p_{1s}	Pt_{1s}	...	p_{11}	p_{1i}	p_{1s}	Pt_{1s}	p_{1N}
2	p_{21}	p_{2i}	p_{2s}	Pt_{ss}	...	p_{21}	p_{2i}	p_{2s}	Pt_{ss}	p_{2N}
...	...	...	...	...	...	...	...	...	...	...
r	p_{r1}	p_{ri}	p_{rs}	Pt_{rs}	...	p_{r1}	p_{ri}	p_{rs}	Pt_{rs}	p_{rN}
m	p_{m1}	p_{mi}	p_{ms}	Pt_{ms}	...	p_{m1}	p_{mi}	p_{ms}	Pt_{ms}	p_{mN}
Total Pt				Pt_1					Pt_n	

C= class of economic activity

3.4 From gross to net valuation of package tours (PT)

The final production estimated by means of the methodology described in par. 3.3 is not yet the whole tourist production. In fact, in a TSA perspective the organizing services, typically representing the main production of Tour Operators (from now on said TO) and included in the final price of a PT, must be treated separately from the rest of services composing a PT and purchased through their intermediation (*IRTS2008*, pg. 87)[7].

[7] Services typically included in a PT are: transport, accommodation, excursions and guided tours, car rental, TA's commissions.

Respecting the previously mentioned separation principle, the value of each service bundled together in a package must be extracted and imputed, in terms of production, to the involved industries. In NA the value of PT is twice imputed: once to TO and TA branch, once to the other involved branches. This duplication vanishes into the value-added, when subtract the intermediate consumption from the production value. Otherwise, from a TSA point of view the production of TO – mainly PT – is required in a net valuation.

In order to meet such requirement the resorting to different kind of sources was necessary, treating separately their data:

A. administrative source;

B. statistical source (SUT).

In detail:

α. has provided the total amount of revenue and of costs related to the main activity of TO, breakdown by *class*. The approach followed was a *top-down*: the difference between revenues and costs, and its share to the first ones, allowed an estimate of the net valuation of PT;

β. has provided information on intermediated consumption distinguished by product. In this case the approach was a *bottom-up*: after an adequate selection of products that may be included in a PT, by means of the level of detailed of SUT, the related cost was estimated using data of *Use* NA's matrix, using the share between the main production and the total amount referred to *class* of TO, tourist by definition.

Although independent and based on different approaches, the two assessment processes showed very similar results. Furthermore, the administrative source is used in accounting evaluation process for the integration of data survey, this latter leading to the SUT data. This matching permitted to calculate an average between the two results. Its application to the main production value of the TO *class* led to its net valuation, as required in (*IRTS2008*).

3.5 Intermediate Consumption (IC) and value added

The representation of IC envisaged in T5 is by industry, but not breakdown by product, due to the remark that, unlike that for production, the analytical purposes of this aggregate does not require, within a TSA's scheme, its precise disarticulation by product[8].

The reconstruction of IC of tourism industries duplicates the methodology for the production estimate – see par. 3.3. The first step, thus, consisted in a correct allocation of all tourist *class* as previously picked out in the matrix of IC, this latter extracted from the SUT. Unlike that for production assessment process, in this case no tourist product could be identified, as it's not possible to actually establish which and how products contributed to tourist production of the industry.

It can be written as:

$P2_{(Ii)}$, the total balanced IC value of the i-th tourist industry, including all products that compose the NA articulation.

However, this way of operating led, in some cases, to a negative value of value added, due to the fact that it is calculated as the difference between the tourist production (exclusively related to tourist products), and an amount of IC referring to all NA's products. Hence, in order to quantify the *tourist* part of the total IC

[8] In (*TSA in the European Union, Vol.3*, par.4.17, pg.42) it is simply suggested, if possible, to consider a breakdown of IC into the following categories of products: agriculture; ores and minerals; food and beverage; machinery and equipment; construction; distributive trade services; financial and related services; business and production services; community, social and personal services.

value it was necessary to weight them with the incidence of tourist production on the total amount by industry, giving now a new *tourist* value of IC.

It can be written as:

$$_{(Ii)}x = \frac{Pt_{(Ii)}}{P_{(Ii)}}$$

the share of tourist production, for the i-th industry, on its total production;

$$_{(Ii)}x * P2_{(Ii)} = Pt2_{(Ii)}$$

the tourist value of IC, for the i-th industry.

One last point. Similarly that for the production, even for IC a net valuation for TO *class* was assessed, as required.

As was done for the production, even for the intermediate consumption the following Table 9 illustrates the final result of the estimation process of P2t using the structure of a *Use* table of NA.

Table 9 – Tourist matrix of IC rendered in a NA matrix structure.

TSA products	**NA branches of economic activities**											**Total**
	NA selected branches for T5's scope											
	1	**2**				**i**	**n**				N	
		C_1	C_i	C_s	Σ	…	C_1	C_i	C_s	Σ	**$p2_{1N}$**	
1	**$p2_{11}$**	**$p2_{11}$**	**$p2_{1i}$**	**$p2_{1s}$**	**$P2_{1s}$**	**…**	**$p2_{11}$**	**$p2_{1i}$**	**$p2_{1s}$**	**$P2_{1s}$**	**$p2_{2N}$**	**p_{1N}**
2	**$p2_{21}$**	**$p2_{21}$**	**$p2_{2i}$**	**$p2_{2s}$**	**$P2_{ss}$**	**…**	**$p2_{21}$**	**$p2_{2i}$**	**$p2_{2s}$**	**$P2_{2s}$**	**…**	**p_{2N}**
…	**…**	**…**	**…**	**…**	**…**	**…**	**…**	**…**	**…**	**…**	**$p2_{rN}$**	**…**
r	**$p2_{r1}$**	**$p2_{r1}$**	**$p2_{ri}$**	**$p2_{rs}$**	**P2rs**	**…**	**$p2_{r1}$**	**$p2_{ri}$**	**$p2_{rs}$**	**$P2_{rs}$**	**$p2_{jN}$**	**p_{rN}**
m	**$p2_{j1}$**	**$p2_{m1}$**	**$p2_{mi}$**	**$p2_{ms}$**	**$P2_{ms}$**	**…**	**$p2_{m1}$**	**$p2_{mi}$**	**$p2_{ms}$**	**$P2_{ms}$**	**$p2_{mN}$**	**p_{mN}**
M	**$p2_{m1}$**	**$p2_{M1}$**	**$p2_{Mi}$**	**$p2_{Ms}$**	**$P2_{Ms}$**	**…**	**$p2_{M1}$**	**$p2_{Mi}$**	**$p2_{Ms}$**	**$P2_{Ms}$**	**$p2_{1N}$**	**p_{MN}**
Total P2					**$P2_1$**					**$P2_n$**		
Pt/P					**$x_{(I1)}$**					**$x_{(In)}$**		
P2t					$x_{(I1)} * P2_1$					$x_{(In)} * P2_n$		

C= class of economic activity

As a matter of course, the value added created by tourist industries is measured by means of the difference between production and IC. In T5, in addition to the tourist industries a column is dedicated to the *Other Industries*, inclusive of the rest of the economy. As a result, the total amount of production and of intermediate consumption of T5 must equal the corresponding aggregates referring to the total economy.

However, this overlapping is not possible, due to the net valuation (v) of package tours, both for production and for IC.

For the whole economy VA can be written as:

$$VA = P1 - P2$$

differing from the tourist perspective of T5 as:

$$VA = [(P1\text{-}v) - (P2\text{-}v)]$$

Table 10 - Overall tourism matrix for VATI calculation

CN products	NA branches of economic activities											Total
TSA products	NA selected branches for T5's scope											
	1	2				i	n				N	
		C_1	C_k	C_S	Σ		C_1	C_k	C_S	Σ		
1	p_{11}	$_{(b2)}p_{11}$	$_{(b2)}p_{1k}$	$_{(b2)}p_{1S}$	p_{12}	p_{1i}	$_{(bn)}p_{11}$	$_{(bn)}p_{1k}$	$_{(bn)}p_{1S}$	p_{1n}	p_{1N}	$p_{1.}$
2	p_{21}	$_{(b2)}p_{21}$	$_{(b2)}p_{2k}$	$_{(b2)}p_{2S}$	p_{22}	p_{2i}	$_{(bn)}p_{21}$	$_{(bn)}p_{2k}$	$_{(bn)}p_{2S}$	p_{2n}	p_{2N}	$p_{2.}$
...	...	...	...	...	...	...	...	...	...	...	...	...
r	p_{r1}	$_{(b2)}p_{r1}$	$_{(b2)}p_{rk}$	$_{(b2)}p_{rS}$	p_{r2}	p_{ri}	$_{(bn)}p_{r1}$	$_{(bn)}p_{rk}$	$_{(bn)}p_{rS}$	p_{rn}	p_{rN}	$p_{r.}$
j	p_{j1}	$_{(b2)}p_{j1}$	$_{(b2)}p_{jk}$	$_{(b2)}p_{jS}$	p_{j2}	p_{ji}	$_{(bn)}p_{j1}$	$_{(bn)}p_{jk}$	$_{(bn)}p_{jS}$	p_{jn}	p_{jN}	$p_{j.}$
m	p_{m1}	$_{(b2)}p_{m1}$	$_{(b2)}p_{mk}$	$_{(b2)}p_{mS}$	p_{m2}	p_{mi}	$_{(bn)}p_{m1}$	$_{(bn)}p_{mk}$	$_{(bn)}p_{mS}$	p_{mj}	p_{mN}	$p_{m.}$
M	p_{M1}	$_{(b2)}p_{M1}$	$_{(b2)}p_{Mk}$	$_{(b2)}p_{MS}$	p_{M2}	p_{Mi}	$_{(bn)}p_{M1}$	$_{(bn)}p_{Mk}$	$_{(bn)}p_{MS}$	p_{Mn}	p_{MN}	$p_{M.}$
Total P1	$P_{.1}$	$_{(b2)}p_{.1}$	$_{(b2)}p_{.k}$	$_{(b2)}p_{.S}$	$P_{.2}$	$P_{.i}$	$_{(bn)}p_{.1}$	$_{(bn)}p_{.k}$	$_{(bn)}p_{.S}$	$P_{.n}$	$P_{.N}$	$P_{..}$
Total P2	$P2._1$	$_{(b2)}P2._1$	$_{(b2)}P2._k$	$_{(b2)}P2._S$	$P2._2$	$P2._i$	$_{(bn)}P2._1$	$_{(bn)}P2._k$	$_{(bn)}P2._S$	$P2._n$	$P2._N$	P2..
VA												(P1-P2)
Net valuation P1												$v_{(p1)}$
Net valuation P2												$v_{(p2)}$
VATI												$(P1\text{-}v_{p1})\text{-}(P2\text{-}v_{p2})$

4 COMPILATION OF THE PRODUCTION TABLE BY MEANS OF AN INTEGRATED WORKSHEETS STRUCTURE

The T5 fulfillment with the data assessed through the methodology shown in the previous paragraph is the ending part of a structured process of an automatic compilation built by stages.

The method used is based mainly on the duplication of the matrix format as envisaged in the SUT's structure, thus reproducing the logic of crossing between activity and product.

The work was developed in the following phases:

1. extraction of the matrices of production (P1) and of intermediate consumption (P2) from SUT's structure;
2. treatment of basic statistics deriving from SBS and NA's employment data, aimed to the building of a weighting structure to which bind the SUT data;
3. processing of a matrix of synthesis by branch, breakdown by *class,* for the calculation of production and intermediate consumption;
4. construction of an overall matrix for the calculation of the value added with the output processed in step 3;
5. automatic compilation of T5, aggregating data by class for composing tourism industry;
6. analysis of the results, made by means of a check matrix, automatically constructed at downstream of the development process, checking the respect of consistency constraints between supply and use.

First of all P1 and P2 matrices was extracted from SUT (phase 1), due to their crucial role for calculating value added. Starting from these matrices we proceeded to the identification of the branches whose data are relevant within TSA's scope, according to the logic described in Table 7.

Although sufficiently detailed for a NA analysis (266 products*106 branches) such matrices is too aggregated for the TSA's aims. As a result, for each branch it was necessary to separate out the share of production related to non-tourist *class*. Such achievement required a *bottom-up* approach, assessing the level of production by *class,* then binding it to the balanced constraint of branch.

As a result in the next phase 2 the weighting structure by class is calculated; however, if the need of a higher level of detail might occurred, the availability of employment data up to the 5 digits level was used in order to permit such refinement.

This weighting structure – by *activity* - is automatically updated according to information base introduced as input, thus correspondingly updating the matrices of the next phase 3, so called matrices of synthesis by branch and breakdown by *class*, referred to the only branches relevant for T5's scope.

The information base required as input for the processing of the matrices of phase 3 is the total balanced value of production and intermediate consumption by branch - P.i and of P2.i - derived from the SUT. Starting from this point, the link with the previously elaborated weighting structure (phase 2), by means of the *class* ISIC code permitted to distribute P.i and P2.i by *class*.

The main results of phase 3 are:

$$ {}_{(bi)}p_k, \quad {}_{(bi)}p_{kj} \quad P_{.i} \quad P_{(Ii)} \quad Pt_{(Ii)} $$

for the production and

$$ {}_{(bi)}\,p2_k, \quad P2_{(Ii)} \quad Pt2_{(Ii)} $$

for intermediate consumption, as defined in par. 3.3.

All these aggregates merged in a further structure (phase 4), namely an overall summary matrix, in which the single P1 and P2 matrices, calculated for each branch (phase 3) are now displayed together.

Operationally, this step was carried out bringing the matrices of synthesis by branch in the overall matrix, thus creating a matrix structured as follows:

- the rows show data by product, according to the SUT structure;
- the columns show data by branch – among those selected for T5's achievement - articulated by class.

All these worksheets are automatically updated through a structured system of accounting constraints, for any year of processing, just introducing as inputs:

- information base needed to built weight matrices;
- annual SUT data, whose framework is updated for producing national accounts.

For P2, as explained in par. 3.5, an additional step was required: the assessment of a *tourist* value of P2 by means of the incidence of tourist production on the total amount of the industry ensure the proportionality between tourist P1 and tourist P2. Only for the *class* of TO such vector was further corrected in order to guarantee the net valuation even for P2.

The two matrices - P1 and P2 overall matrix – merged in a single structure, VATI overall matrix – see Table 10 - where P1 overall matrix is integrated with P2's vector by industry, derived from P2 overall matrix. The calculation of VATI is the result of a subtraction operation. VATI overall matrix displays P1 and P2 in a tourist perspective but still according to the SUT structure. Therein, NA production matrix is now emptied of all

components not included in tourism sector. At this point of the work it was necessary to elaborate data in order to meet TSA logic. In this sense additional processing were necessary, organizing and structuring data following the structure envisaged in T5, namely grouping *class* in order to compose the tourism industries.

In this phase, the output produced in the previous phases, appropriately treated, converge in T5, in the matrix format provided by (*TSA2008* pg. 69) and shown in Table 11.

Once the pointing system between Italian NA's SUT and T5 is operating, VATI is automatically calculated by industry and for the total tourism sector, whose cascading updating is guaranteed after the simple data entry described in point 2 of the paragraph.

This phase represents the culmination of the whole methodological process, because it summarizes and draining purposes.

Downstream of this whole process there is, finally, an automated system of controls over processing produced, aimed at verifying compliance with the accounting equality underlying the construction of SUT, namely:

1. P1 + Imports = P2 + FC
2. P1 = P2 + VA

Key element of this process is the check of value added, representing the constraint of consistency between supply and uses, in that sense being a "litmus test" on the quality of elaborations produced.

Table below shows a simplified scheme of Table 5, where the aggregates estimated in the previous worksheets are now organized and structured following the TSA's logic.

Table 11 – Simplified scheme of a T5

TSA products	Tourism Industries									
	I_1	I_2	I_3	I_4	I_5	I_6	I_7	I_8	I_9	I_{10}
1	Pt_{11}									
2		Pt_{22}	Pt_{23}	Pt_{24}			p_{27}		PT_{29}	
…										
r	Pt_{r1}	Pt_{r2}		Pt_{r4}	Pt_{r5}	p_{r6}		p_{r8}	PT_{rs}	
m							p_{m7}		PT_{ms}	PT_{m10}
Total Pt	Pt_1	Pt_2	Pt_3	Pt_4	Pt_5	Pt_6	Pt_7	Pt_8	Pt_9	Pt_{10}
Totale Pt2	$Pt2_1$	$Pt2_2$	$Pt2_3$	$Pt2_4$	$Pt2_5$	$Pt2_6$	$Pt2_7$	$Pt2_8$	$Pt2_9$	$Pt2_{10}$
VATI	**Pt-Pt2**	**Pt-Pt2**	**Pt-Pt2**	**Pt-Pt2**	**Pt-Pt2**	**Pt-Pt2**	**Pt-Pt2**	**Pt-Pt2**	**Pt-Pt2**	**Pt-Pt2**

Conclusions

This work, within the implementation process of the first Italian TSA, focused on a development of a methodology allowing to measure the production of the tourism industries, in a consistently way with NA procedures. The whole tourism sector assessment process is based on basic data at the highest level of detail at disposal. Furthermore, it has benefited of the level of detail of Italian SUT. The need to move within internationally defined standard required special attention when applying them in the Italian context.

The key findings highlighted in this work are twofold: on the one hand, the implementation of a methodology consistency with the existing accounting heritage, on the other, innovation and development in working methods.

The first strictly derives from the particular perspective analyzed by TSA. The *bottom-up* approach, distinguishing the treatment of information base, and the *top-down* approach that characterized that of SUT data, provided national accountants an important element for reflection: the needs of aggregation typical of NA aggregates, must always ensure the binding of consistency with the information base, from which it derives.

The second is based on operational aspects. The graduated fulfillment of the production table of the tourist industries – T5 - led to the building of a set of integrated worksheets, each one designed for an automatic calculation of its output. Their modular structure allows to decouple the process of compiling for a particular reference year, which ranks as a tool for a time series analysis.

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