Tourism impacts on employment in the metropolitan region of Vitória-ES: an application of demand coefficients[1]

Impactos do Turismo sobre o Emprego na Região Metropolitana de Vitória-ES: uma aplicação de coeficientes de demanda

Los Impactos del Turismo sobre el Región Metropolitana de Vitória-ES: una aplicación de coeficientes de demanda

Eduardo Reis Araujo[2]
Leandro de Souza Lino[3]
Paulo Henrique Assis Feitosa[4]

Abstract

This paper aims to evaluate labor market impacts in twelve touristic activities of six cities from Vitória-ES metropolitan area, using estimation of demand coefficients. The methodology used suggests labor market indicators to be used as means to evaluate these impacts from the combination of primary data and official statistics. The study main contributions to the current stage of academic research are: the proposal of delimitating tourism supply according to the definition of the World Tourism Organization; and the originality of field research in estimating the share of tourism consumption in relation to total touristic supply in the municipal scope.
Keywords: Tourism economics; Espírito Santo; Demand coefficient

Resumo

Este artigo tem como objetivo avaliar os impactos sobre o mercado de trabalho, em doze atividades turísticas em seis municípios da Região Metropolitana da Grande Vitória-ES, a partir da estimação de coeficientes de demanda.A metodologia usada sugere o uso de indicadores do mercado de trabalho como um meio para avaliar estes impactos a partir da combinação de dados primários originais e estatísticas oficiais. Suas principais contri-

2 Master's and Bachelor's degree in Economics from the Federal University of Espírito Santo. Consultant at Espírito Santo State Department of Taxation and Finance. Brazil. E-mail: bigreis@gmail.com
3 Professor at Unicape/Faesa. Master's degree in Applied Economics from the University of São Paulo. Bachelor's degree in economics from the Federal University of Espírito Santo. Brazil. E-mail: lslino@gmail.com
4 Doctoral candidate in Economics at State University of Campinas (UNICAMP). Master's and Bachelor's degree in Economics from the Federal University of Espírito Santo. Brazil. E-mail: paulohenriquefeitosa@gmail.com

buições para o estágio atual das pesquisas acadêmicas são a proposta de delimitação de oferta turística compatível com a definição da Organização Mundial do Turismo e o próprio ineditismo da pesquisa de campo para estimação da participação do consumo turístico em relação ao total da oferta turística no âmbito municipal.

Palavras-chave: Economia do Turismo; Espírito Santo; Coeficiente de Demanda.

Resumen

Este artículo tiene como objetivo evaluar los impactos en el mercado de trabajo generados por las doce actividades turísticas en seis municipios de la Región Metropolitana de Vitória-ES, a partir de la estimación de coeficientes de demanda. La metodología sugiere el uso de indicadores del mercado de trabajo como medio para evaluar estos impactos de la combinación de los datos primarios originales y de estadísticas oficiales. Sus principales contribuciones al estado actual de la investigación académica son la propuesta de delimitación de oferta turística compatible con la definición de la Organización Mundial del Turismo y la propia característica inédita de la investigación de campo para la estimación de la participación del consumo turístico en relación al total de la oferta turística en el ambito municipal.

Palabras clave: Economia del Turismo; Espírito Santo; Coeficiente de Demanda.

1. Introduction

A major effort has been carried out in the past few years to produce, analyze and disseminate tourism economics data and information in Brazil. Such commitment is essential to a more systematic planning of tourism development, requiring constant updated information and comparison with other countries. Among the main faced challenges are the problems of the very definition of tourism and the scarcity of data to evaluate the performance of tourism at subnational levels. The purpose of this work represents an important initiative in this direction.

Considering these challenges, we agree with the literature that demonstrates that the use of labor market indicators is a viable alternative to measure the economic impacts generated by tourism, in view of the scarcity of statistical information and the limitations of macro-economic methodologies to evaluate the performance of tourism at subnational level. There is evidence that human labor, among the production inputs of the touristic service, has a greater relevance than other economic activities (TAKASAGO et al., 2011). There is also a growing interest of government institutions in using labor market indicators as benchmarks to measure the performance of tourism (OMT, 2010).

Among the studies that use the labor market as a proxy of the economic activity in tourism, the main methodological problem found is to measure the jobs in this sector as "tourism industry jobs" and not "jobs generated by tourism industries", which leads to overestimation problems resulting from the inclusion of the consumption portion destined to non-visitors. According to the World Tourism Organization, the researchers' difficulty in incorporating demand information when calculating statistics is precisely one of the aspects that still needs the development of studies.

In face of this challenge, to reconcile data on tourism supply and demand is ultimately what allows to apprehend tourism effects and is the path to be pursued by this work. In other words, without debugging the share of tourist consumption in total sales of tourism industry establishments and without deducting the percentage of consumption from non visitors, it is almost impossible to make accurate inferences about the impact of tourism activity.

As for Brazil, the main initiative in search of a methodology for mitigating the problems of overestimation of the labor market is due to a study from IPEA (2006). This study suggests the creation of a coefficient of tourism services or demand coefficient, in order to identify the percentage of a given establishment production that results from visitors consumption activity. Using this initiative as a starting point and joining forces with it, the present paper will try to obtain the combination of primary data from field research with secondary data from official statistics. The objective is to measure economic impacts generated by twelve touristic activities in six cities from Vitória-ES metropolitan area, from estimation of the demand coefficients.

This paper is organized in six sections, in addition to this introduction. The second section discusses the theoretical and conceptual aspects of the tourism economics. The methodology used to estimate the coefficients is presented in the third section. The fourth section describes the data analyzed in this paper. The results of the estimation of demand factors are presented in the fifth section and the last section presents the final considerations.

2. Tourism economics: theoretical and conceptual aspects

Touristic activity is a phenomenon associated with people travelling to destinations located outside their "usual environment"[5] and is responsible for generating implications of social, cultural and economic character in society. In general, "tourism" is defined as a category of "journey", while "visitor" is an expression used to mention the subcategory of "traveler", one who makes out touristic trips. Figure 1 shows an illustrative scheme of the paper's approach to these differences.
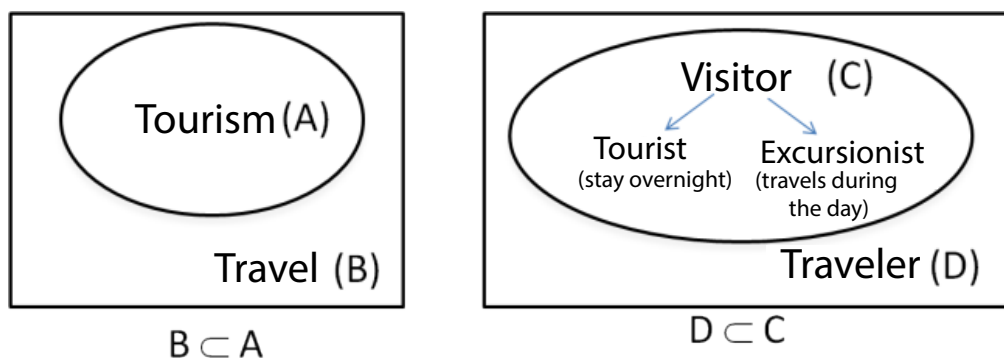

Figure 1 – Illustrative scheme definition of tourism and visitor

Source: own elaboration

The term "visitor" refers not only to tourists who are visitors and stay overnight, but also to excursionists who are day visitors. This includes travelers who make trips lasting less than a year, and for any purpose (leisure, business, education, family visit, health or other personal reasons), unless going to work in the destination.

From an economic point of view, tourism is defined mainly by the demand, i.e. by visitors consumption (OMT, 2010)[6]. Some researchers state that there are no companies touristic by nature, but a set of products that become touristic according to their final consumption (GODED SALTO, 1998; SILVA, 2007).

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[5] "Usual environment" is a concept used by the World Tourism Organization (UNWTO) to state that tourism activity includes trips in people's everyday life. Although literature does not establish geographic boundaries, it is evident UNWTO concern in exclude geographical boundaries within which an individual displaces himself within his regular routine of life, e. g., go to work or to school.

[6] The document entitled "Recomendaciones para elaboración de estadísticas turísticas 2008", elaborated by the World Tourism Organization in partnership with the United Nations Statistics Division was the main source used in this work, given the interest of the research in standardize concepts, definitions, classifications and indicators compatible with conceptual framework of Tourism Satellite Account.

Tourism Economics is responsible for studying and understanding the characteristics of tourism from different points of view, including the possibility to evaluate potential impacts derived from its economic performance. The rise of this field of research, in a way, is associated with empirical evidence that demonstrates the contribution of tourism to generate income (KIM et al., 2006; LEE, 2008; BALAGUER; CANTAVELLA-JORDA, 2008; TAKASAGO et al., 2011) and even to stabilize economic crises (TOULOUSE, 2012).

Still regarding definitions, "inbound tourism consumption" comprises the sum paid by visitors for consumer goods and services, such as transportation, accommodation, food and beverages, valuables, all kinds of food (prepared or not), all manufactured objects that are locally produced or imported, all types of services purchased during the period of stay for the visitor himself or to offer as a gift to third parties. It also includes sums paid or reimbursed by third parties - as is the case of business trips, accommodation costs are paid by the companies.

"Tourism characteristic products" represent a significant share of total "tourism expenditure" of visitors, and on the other hand these products consumption would decrease significantly in the absence of visitors (OMT, 2010).

"Tourist consumption" is a concept used in this work to narrow the subject to cases of tourist expenditure with final consumer goods, namely, those cases in which visitors deal directly with the establishments (OMT, 2010). Therefore, this study excluded expenditures with investment goods, advertising, consulting services and other types of support services, investigated in methodologies using Tourism Satellite Accounts[7].

"Tourism supply" is a set of Tourism Characteristic Activities (TCA), responsible for offering tourism characteristic products, here also called "tourism industry". In theory, in this category of establishments are only those that have a high dependence on visitors consumption and that would cease to exist in the absence of these visitors.

Delimitating boundaries for "tourism supply" is a key aspect for tourism economic impacts study, particularly for Brazil, for there is no official consensus on which economic activities

[7] Tourism Satellite Account is the conceptual framework for a global reconciliation of tourism supply and demand data and has a wider range of tourism demand that not only includes tourism consumption, but also collective tourism consumption and fixed capital formation.

belong to tourism. In general, the World Tourism Organisation proposes twelve categories of tourism industry, showed in Table 1 with their respective tourism characteristic products.

Tourism Characteristic Products	Tourism Characteristic Activities (TCA) or Tourism Industries
1. Accommodation services for visitors	1. Accommodation for visitors
2. Food and beverage supply services	2. Food and beverage supply activities
3. Railway passenger transport services	3. Railway transportation
4. Road transport passenger services	4. Road transport
5. Water transport passenger services	5. Water transport
6. Air transport passenger services	6. Air transport
7. Transportation equipment rental services	7. Transportation equipment rental
8. Travel agencies and other reservation services	8. Travel agencies and other reservation services activities
9. Cultural services	9. Cultural activities
10. Sport and recreation 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. Other country-specific tourism characteristic activities

Table 1 – List of categories of tourism characteristic products and of tourism characteristic activities (tourism industries)

Source: OMT, 2010

Items *11 Tourism characteristic goods and 12. Tourism characteristic services* refer to the varieties of products or industries that can be defined according to tourism specificities of each country. An example is the activity of supermarkets that could be included in category 11, if that business activity has relevant participation in tourists' expenditure in a certain location. Tourism industries are classified by codes of the *Clasificación Internacional Industrial Uniforme* (CIIU) and respective economic subclass code, according to version 2.1 of the National Classification of Economic Activities (CNAE).

3. Methodology

Among various methods for estimating tourism economic impacts, a first research group refers to the publications that use the sum of tourism industry jobs[8], when calculating the total "tourism industries Jobs" and not the "Jobs generated by tourism industries"[9], highlighting the problems of overestimation due to the inclusion of the portion of non visitors consumption (ILO, 2004).

As for Brazil, the proposal for mitigating the overestimation of the impact of tourism on labor market (IPEA, 2006) is to estimate coefficient of tourism services or demand coefficient, in order to identify the percentage of a given establishment production that results from visitors consumption activity.

The problem of segregating or of identifying the contribution of tourism demand in the total supply of tourism industry establishments is also present in Tourism Satellite Accounts methodology. The concepts of gross value added of tourism industries (GVATI) and tourism direct gross value added (TDGVA) (OECD, 2008), for example, are different, in the former production is directed or not to visitors, while in the latter is restricted to visitors only.

In international literature, it is also possible to identify similar concepts as "ratio del turismo" or "tourism ratios", which refers to the ratio or share of total tourism industry production (ILO, 2004). The OECD document (2000) contains the guidelines to carry out the calculation of employment statistics with use of the "Tourism Ratio". The OECD methodology assumes the use of the table of resources and uses (TRU) of National Accounts, which is adjusted to segregate the portion of tourism characteristic products that are consumed by tourism demand[10]. The methodological difference between the coefficient of tourism services estimated by IPEA (2006) and the Tourism Ratio proposed by OECD is essentially twofold, in what concerns the data source and the variables used.

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[8] For example, works from the Argentina Tourism Office (2007) and Minas Gerais Tourism Office (2012).

[9] Observe the subtle difference among concepts, because the total of "Tourism industries jobs" is different from total of "Jobs generated by tourism". The first indicator is simply a count of the number of people employed in the tourism industries and does not take into account jobs generated exclusively by tourism. The second concept corresponds to a more adequate result, in our opinion, for portraying the amount of jobs created as a result of visitors consumption.

[10] Tourism demand is broadly defined in this case. It is formed by the sum of families consumption (i.e. the acquisition of tourism characteristic products by visitors) and the intermediate consumption (purchase of tourism characteristic products by companies).

The methodology of IPEA (2006) is based on information from tourism industries customer profiles and separate visitors and non-visitors. Therefore, the establishment representative perception is the source used to calculate the percentage of tourists and, in turn, the share of employment generated by tourism. Directly proportional relationship exists, for example, if a tourism industry has on average 70% of visitors as customers. If so, 70% of tourism industry jobs are generated by tourism.

OECD uses monetary variables from the Table of Resources and Uses. In addition, census researches are used to know the types of products that people and companies purchased in the period of one year (ILO, 2004). The share of employment generated by tourism is, in a simplified way, a direct proportion of sales made by establishments to visitors and other tourism industries.

Another study group defends the thesis that the best way to analyze the economic impact of tourism is by the use of regional input-output matrices (WIEN, 1989), in which is possible to identify the generation of added value, tax revenue and job creation. Their proposal is an assessment of direct and indirect effects that tourism exerts on labor market. Among the works that use input-output matrix to evaluate the impact of tourism demand on jobs and income generation we may point out Cassimiro Filho (2002); Arbache et al. (2008); Takasago et al. (2011); Takasago and Mollo (2011).

Takasago and Mollo (2011) used the latest version of the brazilian input-output matrix and thus, were able to make a more precise selection of Tourism Characteristic Activities (TAKASAGO et al., 2011). Furthermore, they used the coefficient of tourism services estimated by IPEA to separate the portion of demand that caters to non-visitors, from the portion that caters to visitors (tourists and excursionists).

There are four main methodological alternatives to analyze the impact of tourism on job creation: 1st) studies measuring employment in tourism industries without using coefficient or other supply adjustments; 2nd) works that use techniques for estimation of coefficient of tourism services, in the same way as IPEA; 3rd) researches that follow the OECD in the use of Tourism ratios or Ratio del Turismo; 4th) publications that adopt input-output matrices to evaluate direct, indirect and induced impacts of tourism on job creation.

As was here demonstrated, the application of the first alternative is not rejected in this work due to overestimation of the effects of tourism on the economy. Third and fourth alternatives, even with significant potential, cannot yet be applied to municipal studies due to the absence of input-output matrix or TRU for the municipalities surveyed. Therefore, the second alternative is more suitable for investigating the impact of tourism in these municipalities and will be presented in the next section.

3.1. Tourism demand coefficient

In a initial approach, the tourism demand coefficient, T_{s_i} , can be defined by the ratio of the purchases made by visitors v_{s_i} to the overall revenue of c_{s_i} tourism industry in time.

$$T_{s_i} = \frac{v_{s_i}}{c_{s_i}}$$

Where: v_{s_i} expresses the overall revenue of tourism industry demanded exclusively by visitors in i; c_{s_i} is the overall revenue of demanded by visitors as well as non-visitors in i; s is a qualitative variable assigned to the tourism industries, defined in the range $\{s \in \mathbb{N} \mid 1 \leq s \leq 10\}$ (see Table 1); is a qualitative variable referring to the months of the year $\{i \in \mathbb{N} \mid 1 \leq i \leq 12\}$.

By way of illustration, let us consider $s = 1$, $i = 1$, $c_{s_i} = $ R\$ 500 mil and $v_{s_i} = $ R\$ 250 mil, which implies $T_{s_i} = 0,5$. In this case, the coefficient T_{s_i} indicates that tourists contributed with only 50% of overall sales in the subsector of "accommodation for visitors" in the month of "January".

Ideally, the estimate of c_{s_i} would be obtained from the revenue declared by companies to Municipal or State Department of Treasury. And it would also be desirable to obtain the information on v_{s_i} through administrative records or other means that would allow the identification of the sales portion destined exclusively for visitors (tourists and non-tourists). But the companies sales assessment has a high cost and is difficult to carry out, as well as the administrative records assessment of establishments, with the objective of measuring the volume of purchases made by visitors.

The alternative to circumvent the problems of data collection, is to use other variables. For example, an opinion survey with questions to establishment owners about the percentage of sales attributable to visitors could be used to evaluate tourism demand patterns.

With this alternative method, the random variable is here defined that will be an estimate of the real value of T_{s_i}, based on the sum of the product of x_{s_i} by w_{s_i}, being subject to error[11] ε_{s_i} :

$$\widehat{T}_{s_i} = t \sum_{j=1}^{n} (x_{s_i} \cdot w_{s_i}) + \varepsilon_{s_i}$$

Where: $\widehat{T}_{s_i}$ is a random variable defined in the interval $\{ \widehat{T}_{s_i} \in \mathbb{Q} \mid 0 \leq \widehat{T}_{s_i} \leq 1 \}$; x_{s_i} is a random variable contained in $\{ x_{s_i} \in \mathbb{Q} \mid 0 \leq x_{s_i} \leq 1 \}$ and indicating the opinion of the establishment owners about the portion of sales destined to visitors for the establishments of touristic industry in time interval ; is a weighting factor that varies in the interval $\{ x_{s_i} \in \mathbb{N} \mid 0 \leq x_{s_i} \leq 1 \}$, obtained by the ratio of overall jobs in the establishment and overall jobs in the subsector; is a discrete qualitative variable that takes values in the interval , depending on the month used as reference; s is a qualitative variable that defines tourism industry set in the interval $\{ s \in \mathbb{N} \mid 1 \leq i \leq 10 \}$ and ε_{s_i} an error term that is assumed to be $\varepsilon_{s_i} = 0$.

For a better understanding, consider that $i = 2$, $n = 3$, and that $(w_{2_1})_j$ assigned to each of the j establishments match $\{0{,}5; 0{,}2; 0{,}3 \mid j = 1,2,3\}$ and that the values $(x_{2_1})_j$ are equivalent to $\{0{,}9; 0{,}8; 0{,}75 \mid j = 1,2,3,\}$, so $\widehat{T}_{2_1}$ will be:

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[11] The error term $\varepsilon_{s_i} = \widehat{T}_{s_i}$ is related to the chance of obtaining x_{s_i} values different from v_{s_i}/c_{s_i}, given that the opinion survey provides only an estimate of the real participation of visitors on companies' income. For this reason, the data collected are subject to an unknown error type. This work supposed that the survey informant has correct informations, resulting in the assumption that.

$$\widehat{T}_{2_1} = \sum_{j=1}^{3} (x_{2_1} \cdot w_{2_1}) \quad \bigg| = (0.5 \cdot 0.9) + (0.2 \cdot 0.8) + (0.3 \cdot 0.75) = 0.835$$

Observe that the coefficient $\widehat{T}_{2_1}$ is just one among other estimates for the tourism demand coefficient according to values $i = \{1,2,3 \ldots,12\}$ and $s = \{1,2,3 \ldots,10\}$. Therefore, the most appropriate way to make reference to coefficients of all tourism industries of the region, over the period of one year, is to use the tourism coefficients matrix i x s, being $i = 12$ rows and $s = 10$ columns:

$$\widehat{T} = [\widehat{T}_{i_s}] = \begin{bmatrix} \widehat{T}_{1_1} & \widehat{T}_{1_2} & \widehat{T}_{1_3} & \ldots & \widehat{T}_{1_{10}} \\ \widehat{T}_{2_1} & \widehat{T}_{2_2} & \widehat{T}_{2_3} & \ldots & \widehat{T}_{2_{10}} \\ \vdots & \vdots & \vdots & \vdots & \vdots \\ \widehat{T}_{12_1} & \widehat{T}_{12_2} & \widehat{T}_{12_3} & \ldots & \widehat{T}_{12_{10}} \end{bmatrix}$$

If we assume the existence of a direct proportionality between the percentage of sales destined to visitors and the overall jobs generated by tourism activity, we will be able to produce inferences regarding the impact of tourism on job creation on the basis of the matrix $\widehat{T}$. That is, if we define the matrix $U = [u_{s_i}]$ as the matrix that provides the number of jobs, distributed over $s = \{1,2,3\ldots,10\}$ lines and $i = \{1,2,3\ldots,12\}$, then the product $\widehat{T}.U$ will be the result of total employment generated by tourism in a certain municipality in the period of 12 months.

$$\widehat{T}.U = [\widehat{T}_{i_s}][u_{s_i}] = \begin{bmatrix} \widehat{T}_{1_1} & \widehat{T}_{1_2} & \widehat{T}_{1_3} & \ldots & \widehat{T}_{1_{10}} \\ \widehat{T}_{2_1} & \widehat{T}_{2_2} & \widehat{T}_{2_3} & \ldots & \widehat{T}_{2_{10}} \\ \vdots & \vdots & \vdots & \vdots & \vdots \\ \widehat{T}_{12_1} & \widehat{T}_{12_2} & \widehat{T}_{12_3} & \ldots & \widehat{T}_{12_{10}} \end{bmatrix} \times \begin{bmatrix} u_{1_1} & u_{1_2} & u_{1_3} & \ldots & u_{1_{12}} \\ u_{2_1} & u_{2_2} & u_{2_3} & \ldots & u_{2_{12}} \\ \vdots & \vdots & \vdots & \vdots & \vdots \\ u_{10_1} & u_{10_2} & u_{10_3} & \ldots & u_{10_{12}} \end{bmatrix}$$

Note that the result of matrices multiplication $\widehat{T}.U = [\sum_{S=1}^{n} \widehat{T}_{i_s} . u_{s_i}$ originates a vector whose rows represent the number of jobs generated in each reference month. For example, being $i = 1$ the result of the first line expresses the number of jobs generated in "January", the second line "February" and so on.

$$[\widehat{T}_{i_s}][u_{s_i}] = \begin{bmatrix} \widehat{T}_{1_1} u_{1_1} + \widehat{T}_{1_2} u_{2_1} + \widehat{T}_{1_3} u_{3_1} + \cdots + \widehat{T}_{1_{10}} u_{10_1} \\ \widehat{T}_{2_1} u_{1_2} + \widehat{T}_{2_2} u_{2_2} + \widehat{T}_{2_3} u_{3_2} + \cdots + \widehat{T}_{2_{10}} u_{10_2} \\ \vdots \quad \vdots \quad \vdots \quad \vdots \quad \vdots \\ \widehat{T}_{12_1} u_{1_{12}} + \widehat{T}_{12_2} . u_{2_{12}} + \widehat{T}_{12_3} . u_{3_{12}} + \cdots + \widehat{T}_{12_{10}} . u_{10_{12}} \end{bmatrix}$$

For example, if $s = 2$, $i = 1$, and , $u_{21} = 1500$ and $\widehat{T}_{2_1} = 0.835$, then the product of $\widehat{T}_{2_1} u_{s_i} = 0.835$ x $1500 \cong 1252$ provides the estimate of 1,252 jobs generated for the "food

and beverage" subsector in January. To calculate the impact of tourism on job creation at this location, it would be necessary to compute statistics for all other tourism industries.

It will be admitted as an assumption in this work that the matrix [$\hat{T}_{i_s}$] expresses a structural feature of the tourism activity in the city and, consequently, the coefficients will be constant in every triennium. Consequently, once estimated the matrix coefficients [$\hat{T}_{i_s}$], data from [u_{s_i}] may be obtained free of charge in secondary sources, as from the Ministry of Labor and Employment Annual Social Information Report (RAIS/MTE).

4. Data description

To measure the impact of tourism on job creation it is necessary to estimate the product of matrices [$\hat{T}_{i_s}$][u_{s_i}]. In this section are discussed the procedures used for data collection from primary and secondary sources to estimate the product of matrices and fulfill the purposes of this research, which is to assess the local economic impact of tourism.

Primary data collection from field survey provided the observations of variables x_{s_i}, w_{s_i} and, in turn, made it possible to consolidate the matrix results [$\hat{T}_{i_s}$]. Remembering that x_{s_i} refers to the opinion of the companies on which portion of sales are destined to visitors, while w_{s_i} refers to the weight[12] of these observations in the final calculation of the tourism demand coefficient.

It has already been stated the difficulty of x_{s_i} data collection. Here it is still necessary to clarify that in an attempt to reconcile this research methodology with the one used by IPEA (2006), we decided to question the respondent about the percentage of visitors who went to the establishment. That is, instead of questioning about the percentage of sales for tourists, we decided to ask about the service percentage.

With this methodological option of investigating the type of attendance, it is understood that is implied the hypothesis of average sales equivalence between visitors and non-visitors. In other words, the work assumes that tourists and non-tourists have the same consumption pattern.

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[12] Large-sized establishments (with a greater number of employees) are those of higher w_{s_i}, which results in greater influence of their observations in the final calculation of the coefficient of tourism services.

The respondent selection is also one of the criteria that contribute for minimizing error and that you may assume ε_{s_i}. In this sense, it is important to clarify that field interviews were aimed at establishment's representative that had greater knowledge of the commercial activity and of the type of clients served (i.e., whether they were tourists or non-tourists).

The sampling process is also of fundamental importance for inference result. In the case in question, it was adopted a proportionate stratified sampling[13], the economic activity type and the establishment location used as the adopted stratification factors[14]. Selecting establishments at random enabled to maintain the population characteristics in the selected sample. The population count and identification were only possible because of information gathered from three types of databases, in addition to field observations of the respective establishment.

In General, the registration differences are attributed to two factors: 1st) despite the efforts to synchronize tax registers, persisted non-synchronization of data between Federal and State Department of Treasury, with cases of registrations suspended by the State Treasury and still active in the National Treasury; 2nd) there are many establishments that are juridically Individual Micro Entrepreneur (MEI) and although registered in Federal Treasury, have no legal obligations to provide ancillary declaration or maintain records in the State Department of Treasury or in the Ministry of Labor and Employment.

Table 3 illustrates the difference in databases of the National Registry of Legal Entities, Tax Information System of the State Treasury Department and the Ministry of Labor and Employment.

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[13] Simplest form of stratified sampling, in which a stratum corresponding to 20% of the population will also correspond to 20% of the sample.

[14] The stratification factor is a variable used to divide the population into strata.

City	National Treasury	State Treasury	Ministry of Labor and Employment
Vila Velha	4,284	1,532	1,147
Guarapari	1,921	732	612
Fundão	230	68	65
Serra	3,268	1,145	815
Cariacica	2,078	586	430
Viana	335	89	70
Total	**2,019**	**4,152**	**3,139**

Table 2 – Comparison of the number of establishments in the tourism industry from different data sources

Source: CNPJ, Espírito Santo State Department of Taxation and Finance and Ministry of Labor and

Employment (2011)

After adjustment, it was determined a population of 3,139 establishments integrating the tourism industry in the city researched, according to data from the Ministry of Labor and Employment. However, should be noted that this universe varied according to the data source. And using this universe, with a margin of error of 5 percent in all tourism industry activities, the sample was estimated at **1,322** establishments distributed according to Table 4.

Subsectors	Vila Velha	Guarapari	Fundão and Serra	Cariacica and Viana	Total
1. Accommodation for visitors	29	47	34	6	116
2. Food and beverage supply activities	275	175	244	84	778
3. Railway passenger transportation	1	0	0	0	1
4. Passenger road transport	16	14	30	45	105
5. Passenger water transport	0	1	0	0	1
6. Passenger air transport	1	0	0	0	1
7. Transportation equipment rental	10	2	11	20	43
8. Travel agencies and other reservation services	25	3	6	11	45
9. Cultural activities	4	3	9	33	49
10. Sports and recreational activities	10	10	14	42	76
11. Retail trade of tourism characteristic goods	26	50	23	34	133
Total establishments	371	305	371	275	**1,322**

Table 3 – Field research sampling distribution

Source: own elaboration. Notes: The selection of municipalities from the metropolitan area and its division

by areas follows the proposal of the institution that funded this research and the regionalization of tourism in

Espírito Santo state.

Finally, for development of the employment matrix [u_{s_i}] were used micro-data from the Annual Social Information Report (RAIS) of 2010, 2011 and 2012. Data from this database

have been adjusted in order to include establishment owners that work in these companies without a work contract, in working journeys of more than six hours per day.

5. Tourism demand coefficients

This section presents the results of touristic demand coefficients and an assessment of the direct economic impacts generated by tourism, estimated by combining information from field research and RAIS as the methodology previously described.

5.1 Coefficient estimation

The tourism demand coefficient or coefficient of tourism services is an indicator used to estimate the share of consumption by visitors, given the fact that the firms from the tourism industry does not offer products and services exclusively to visitors (tourists and excursionists).

To obtain the estimates, the field research was conducted with a sample of 1,322 establishments distributed in twelve activities and located in six municipalities from the metropolitan area of Vitoria, from a universe of 3,139 companies[15]. The questionnaire sought to raise data on the service percentage destined to visitors in establishments whose main economic activity was framed in CNAE 2.1 subclasses.

After conference of data collected in the field, it was then possible to calculate the tourism demand coefficient, based on the average[16] answer of establishment representatives and the number of employees of each company was the weighting criteria used.

Table 4 brings together the results of the estimated coefficients, revealing the percentage of visitors in each industry. For example, the "accommodation for visitors" activity has higher percentage of visitors, with 67 percent if we consider all municipalities[17].

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[15] The universe used to calculate the sample was based on information from the RAIS of 2011. It is worth mentioning that RAIS of 2012 has only been published in October 2013, after the period of field research planning.

[16] The results were compared with median mode central tendency statistics, indicated when resolving outliers and did not demonstrate significative changes compared to weighed average criteria used.

[17] It is expected tourism demand coefficients to be near 100% in accommodation activities. In the case of this research, for field research simplification purposes the concept of visitor excluded all travelers who had job contracts. With that, in what concerns accommodation in many municipalities, some hotels accommodated mostly professionals not classified as tourists.
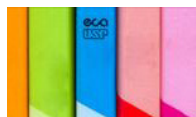
Subsectors	Vila Velha	Guarapari	Fundão and Serra	Cariacica and Viana	Total
1. Accommodation for visitors	61%	67%	74%	66%	67%
2. Food and beverage supply activities	18%	51%	28%	17%	29%
3. Railway transportation	-	-	-	-	-
4. Road transport	22%	49%	36%	24%	33%
5. Water transport	-	-	-	-	-
6. Air transport	-	-	-	-	-
7. Transportation equipment rental	7%	80%	21%	29%	34%
8. Travel agencies and other reservation services	26%	49%	19%	20%	29%
9. Cultural activities	40%	80%	9%	35%	41%
10. Sports and recreational activities	26%	32%	6%	6%	18%
11. Retail trade of tourism characteristic goods	22%	51%	18%	20%	28%

Table 4 – Tourism demand coefficient in the municipalities [$\widehat{T}$]

Source: own elaboration

Still regarding Table 4, it is possible to verify that, on the other hand, the category Sports and Recreational Activities is considered the industry with lowest amount of visitors. The explanation for this low percentage of visitors is related to the high number of companies in the location that, although classified as members of this industry, do not offer tourism products and services. Table 5 shows a comparison of tourism industries' coefficients of tourism services gathered in this research with the estimated coefficients to the Southeast by IPEA.

Subsectors	Own elaboration [$\widehat{T}$]	IPEA (2006)	Difference
1. Accommodation for visitors	67%	74%	-7%
2. Food and beverage supply activities	29%	29%	0%
3. Railway transportation	-	-	-
4. Road transport	33%	2%	31%
5. Water transport	-	31%	-
6. Air transport	-	86%	-
7. Transportation equipment rental	34%	39%	-5%
8. Travel agencies and other reservation services	29%	79%	-50%
9. Sports, cultural and recreational activities	41%	3%	38%
10. Sports and recreational activities	18%	-	-
11. Retail trade of tourism characteristic goods	28%	-	-

Table 5 – Comparison of municipal tourism demand coefficient with the Southeast region (IPEA)

Source: own elaboration and IPEA (2013)

In spite of some methodological differences among the surveys, it is possible to notice that prevails the lowest percentage of service for visitors in tourism industries of the state of Espírito Santo. As for Travel Agencies and other reservation services industry, this difference is still greater, for these

industries have 29 percent of visitors against the average of 79 percent in the Southeast region. This result suggests that establishments located in these cities serve mostly local residents, that is, it is related to the nature of the services offered by these agencies, for they are outbound and not inbound.

5.2 Estimate of employment and income generated by tourism activities

It is possible to infer the impact or the overall employment generated by tourism activities in the region, since it is accepted this work central hypothesis that exists a directly proportional relationship between the tourism demand coefficients and the total direct formal jobs generated by tourism. Under these circumstances, Table 6 brings the total formal employment by area and subsector in six cities from the metropolitan area of Vitória.

Subsectors	Vila Velha	Guara-pari	Fundão and Serra	Cariacica and Viana	Total
1. Accommodation for visitors	353	555	300	46	1,254
2. Food and beverage supply activities	3,914	1,310	2,797	1,403	9,424
3. Railway transportation	-	-	-	-	-
4. Road transport	315	119	730	1,362	2,526
5. Water transport	-	-	-	-	-
6. Air transport	-	-	-	-	-
7. Transportation equipment rental	45	15	186	86	332
8. Travel agencies and other reservation services	81	25	36	8	150
9. Cultural activities	38	7	21	5	71
10. Sports and recreational activities	158	463	105	18	744
11. Retail trade of tourism characteristic goods	165	49	94	56	364
(I) Total tourism activities	**5,069**	**2,543**	**4,269**	**2,984**	**14,865**
(II) Total formal jobs in the municipalities	**110,393**	**22,567**	**132,973**	**69,716**	**335,649**
% (I) in (II)	**4.59%**	**11.27%**	**3.21%**	**4.28%**	**4.43%**

Table 6 – Gross quantity of formal employment per area and subsector [U]

Source: own elaboration

Notes: Corresponds to overall formal employment in each tourism industry in 12/31/2012, according to data from the Ministry of Labor and Employment

This table shows us that if we do not consider the demand coefficients, the twelve touristic sectors have an impact on the economy of the region with the creation of 14,865 formal jobs, being the food and beverage service activities the greatest employer of labor; and the city of Guarapari has the highest employment percentage in relation to total formal jobs. As discussed previously these data are considered overestimated for not deducting consumption percentage of non-visitors. In response to this issue, we present in the next table the product $\widehat{T}.U$ that summarises the impact of

tourism in the generation of direct formal jobs in each municipality of the region. By the sum of this column it is possible to verify that visitors movement contributes with 4,382 formal occupations, representing 1.31 percent of the total number of jobs in these cities in 31 December 2012.

Subsectors	Vila Velha	Guarapari	Fundão and Serra	Cariacica and Viana	Total
1. Accommodation for visitors	214	369	222	31	836
2. Food and beverage supply activities	706	672	783	242	2,403
3. Railway transportation	-	-	-	-	-
4. Road transport	69	59	263	323	714
5. Water transport	-	-	-	-	-
6. Air transport	-	-	-	-	-
7. Transportation equipment rental	3	12	39	25	79
8. Travel agencies and other reservation services	21	12	7	2	42
9. Cultural activities	15	6	2	2	25
10. Sports and recreational activities	41	147	6	1	195
11. Retail trade of tourism characteristic goods	36	25	17	11	89
(I) Total tourism activities	**1,105**	**1,302**	**1,339**	**636**	**4,382**
(II) Total formal jobs in the municipalities	**110,393**	**22,567**	**132,973**	**69,716**	**335,649**
% (I) in (II)	**1.00%**	**5.77%**	**1.01%**	**0.91%**	**1.31%**

Table 7 – Estimate of formal jobs per area and subsector [$\widehat{T}.U$]

Source: own elaboration

From these data we find evidence of food and beverage service activities as being the major employer among tourism subsectors. Although Serra and Fundão are the major employers in absolute terms, in Guarapari tourism subsectors have the largest share of jobs in the city's total jobs.

From a methodological perspective, the results of the demand coefficient estimation are relevant not only for excluding the portion of jobs generated by non-visitors, but also for providing a realistic quantitative description of tourism impact in each municipality. The more realistic description is verifiable in the division proposed, so that at the same time Guarapari registers the lowest job rates in gross and absolute quantities (2,543), when the demand coefficients are applied, this municipality becomes the major employer in relation to total jobs (5.77%).

The same may be applied to gross amount assessment, which is one of the most important economic variables. This means that tourism impact on income generation can be calculated admitting the existence of a directly proportional relation between total income and the tourism demand coefficient. We present on Table 8 tourism impact on monthly income generation.

Subsectors	Vila Velha	Guarapari	Fundão and Serra	Cariacica and Viana	Total
1. Accommodation for visitors	307,895	483,739	288,432	37,961	1,118,027
2. Food and beverage supply activities	3,369,583	1,033,681	2,375,023	1,121,366	7,899,653
3. Railway transportation	-	-	-	-	0
4. Road transport	370,270	136,708	886,137	2,364,444	3,757,559
5. Water transport	-	-	-	-	-
6. Air transport	-	-	-	-	-
7. Transportation equipment rental	59,397	20,047	195,546	104,624	379,614
8. Travel agencies and other reservation services	124,790	20,846	45,603	8,886	200,125
9. Cultural activities	43,204	6,310	21,645	3,721	74,880
10. Sports and recreational activities	119,698	487,424	87,419	13,459	708,000
11. Retail trade of tourism characteristic goods	203,431	2,249,076	150,656	54,421	2,657,584
Total payroll (I)	**4,598,269**	**4,437,831**	**4,050,461**	**3,708,882**	**16,795,443**
Total payroll of all activities (II)	**156,439,907**	**27,649,544**	**231,093,454**	**98,473,619**	**513,656,524**
% (I) in (II)	**2.94%**	**16.05%**	**1.75%**	**3.77%**	**3.27%**

Table 8 – Tourism impact on monthly gross income generation [r]

Source: own elaboration

Without considering the demand coefficients, the twelve tourism subsectors have an impact on these municipalities economy generating a monthly total payroll of R$ 16,795 thousand. The road transport subsector has the greatest participation in this result and the municipalities participate with relatively close percentages, ranging from 22 to 27 percent.

As previously identified, these data have an equal problem of result overestimation, which requires the estimation of the product $\widehat{T}.r$ that summarises the real impact of tourism on total payroll generated in each municipality of the region. By the sum of this column it is possible to verify that visitors movement contributes with R$ 5,374 thousand, representing 1.05 percent of total payroll generated monthly by these municipalities.

Subsectors	Vila Velha	Guarapari	Fundão and Serra	Cariacica and Viana	Total
1. Accommodation for visitors	186,807	321,979	214,504	25,200	748,490
2. Food and beverage supply activities	607,675	530,546	666,415	193,118	1,997,754
3. Railway transportation	-	-	-	-	-
4. Road transport	80,708	67,238	321,165	321,841	1,029,952
5. Water transport	-	-	-	-	-
6. Air transport	-	-	-	-	-
7. Transportation equipment rental	4,158	16,014	40,766	30,742	91,680
8. Travel agencies and other reservation services	33,044	10,206	8,852	1,804	53,906
9. Cultural activities	17,282	5,048	1,988	1,316	25,634
10. Sports and recreational activities	30,934	154,774	5,214	841	191,763

11. Retail trade of tourism characteristic goods	43,868	1,153,918	26,451	10,630	1,234,867
Total payroll (I)	**1,004,475**	**2,259,724**	**1,285,354**	**824,493**	**5,374,046**
Total payroll of all activities (II)	**156,439,907**	**27,649,544**	**231,093,454**	**98,473,619**	**513,656,524**
% (I) in (II)	**0.64%**	**8.17%**	**0.56%**	**0.84%**	**1.05%**

Table 9 – Estimated tourism impacts on monthly total payroll generation

Source: own elaboration

In the case of the total payroll estimate, the calculated demand coefficient confirms the results already found in the employment numbers. Without eliminating the share of total payroll generated by non-visitors, the city of Guarapari represents 26 percent of the total payroll of these municipalities. This percentage rises to 42 percent if demand coefficients are applied. The results of the application of demand coefficients gives us an overview closer to the real impacts generated by tourism, not only between municipalities and regions, but also among sub-sectors studied, which by its labor intensive and payroll levels, are also impacted by overestimation problem.

6. Final Considerations

This work aimed to evaluate the economic impacts generated by twelve tourism activities in six municipalities of the Vitória-ES metropolitan area, having as analysis method the application of demand coefficients. We propose the use of labor market statistical indicators for this purpose as an alternative to evaluate tourism performance in these municipalities. Hence, to contribute in the analytical effort for building data and information that assist the process of construction and evaluation of public policies aimed at developing tourism.

As discussed, even if desirable the use of macroeconomic indicators to assess the sector's economic breadth, the problem identified is that due to the level of aggregation of the economic activities in the "Regional Accounts of Brazil" from IBGE, it is impossible to estimate tourism industries added value at municipal level that would be consistent with the concept of Tourism Satellite Accounts (OMT, 2008).

The solution presented followed IPEA (2006), which carries out field researches to estimate the touristic demand coefficient and by doing this adjust the information from the Ministry of Labor for the right dimensioning of the impact of tourism in job creation and total payroll. As proposed in this work, this adjustment is possible by excluding the share of non-visitors

consumption (generally locals and other types of travellers who cannot be classified as tourists), so that tourism supply data reflect only visitors' consumption behavior.

In summary, the estimated results suggest that the tourism demand is responsible for generating 4,382 direct formal jobs in the cities, which is 1.31 percent of overall employment in this location. In addition, it is estimated to be generated R$ 5,974 thousand in nominal wages per month, that is 1.05 percent of total payroll from economic activities of all municipalities.

Among the major limitations of this study is the absence of information about the informal labor market in the cities of the state of Espírito Santo. This is also a suggestion for future works on this subject. The absence of the quantity of companies operating in the informal market leads to limitations in the analyses and evaluations of the situation of tourism industry in the cities studied.

It is vitally important for future researches on tourism offer from the economic point view to deepen the analysis of the existing productive chain in various tourism industries, including the ones indirectly bound to this sector. However, for a more detailed analysis it is important that the distinction between the demand provided by touristic services, from what is usually consumed by visitors in general, as the methodology presented in this work suggests. Such an analysis would enable a better understanding of the status of activities related to tourism in the municipalities and would promote the development of more adequate public policies. Besides, in a future analysis the relationship between companies of different sizes could be analysed in a broader sense, whether between individual micro entrepreneurs, or micro, small, medium and large entrepreneurs, according to limits established by current legislation.

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