

Assessing the economic contribution of sports tourism events: A regional social accounting matrix analysis approach

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Abstract

In the context of tourism, sports are one of the major attractions countries offer. There cannot be the slightest doubt about the relevance of sports activities for the economy. Previous studies assessing the economic impact of sporting events have usually been partial equilibrium studies. This article contributes to the emerging body of literature by explicitly incorporating four categories of sports tourism events (competitions, championships, tournaments, and leagues), so as to study the effects of sports tourism demand on the economic system in terms of income and added value. It further examines their relative, rather than individual, impact on the regional economy of Castile and Leon through a fixed price multiplier model based on the regional social accounting matrix. The results reveal that sports tourism events represent 3.1% of the regional gross domestic product, highlighting the importance of this sector for its economy.

Keywords

active tourism, hypothetical extraction method, social accounting matrix, sporting events

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Introduction

In recent decades, developments in competitive sports, which may be grouped together under the concept of sporting events, have turned sport into a true economic and employment sector, beyond any intrinsic social contribution it may make. In the context of this phenomenon, increasing flows of people to places where sports events are held have made them particularly relevant for studies of the tourism industry. Participants, escorts, spectators, and organizers all generate expenditure in the area where a sports event occurs, thus making it feasible to create opportunities for cities and regions through the consequent promotion of social and economic development and employment opportunities (Fernández, 2014). Beyond the undeniable attraction that such events have in themselves, public institutions and academics have begun to show a greater interest in understanding how they contribute to the economy, and in their interrelationships with economic activities linked to tourism.

To clarify the role that sports tourism events play in the economy, it must first be understood that this sector is the outcome of a range of activities characterized by serving a part of the economy that is not directly observable, the tourist trade. On these lines, it should be emphasized that sports tourism events are a part of tourist activity, and thus a cross-sectional economic phenomenon that involves inputs from various areas (financial, cultural, and environmental, among others) and generates resources for other sectors (commercial, hotel, transport, and the like) that are outside the domain of sport.

Sporting events¹ such as competitions, championships, tournaments, or leagues are able to attract tourist demand to a city or a region. This may be in the form of participation and direct organization, or in the shape of spectators at these events and people accompanying them, without themselves attending (Ruiz Molina et al., 2010). There is wide recognition of the economic impact that major sports events generate by attracting visitors and through investment in the building of structures required for them (Li and Jago, 2013). This has led to events with sports tourism characteristics becoming identified by researchers as a specific field within tourism studies (Getz and Page, 2016).

Nevertheless, studies of active tourism devote only a small proportion of their content to evaluating the economic impacts of sports tourism events (Comerio and Strozzi, 2019). Moreover, as Drakakis et al. (2020) stated, they generally focus only on the study of major events or consider other specific fields within active tourism.² These include adventure travel (Huddart and Stott, 2019), snow and mountain tourism (Moreno-Gené et al., 2018), rural stays (Park et al., 2014), or ecotourism (Wunder, 2000). Consequently, further research is needed to capture the contribution from sports tourism events held, and the economic impact of flows of tourists to local or regional areas, moving away from a perspective that considers just a single sports event, and expanding the analysis to broader dimensions (Li and Jago, 2013; Salgado et al., 2018).³

When attempting to define sports tourism activity, it is crucial to highlight the influence of public administrations, since they are responsible for organizing a major portion within the total range of sports tourism events on offer (Sáez de Soto, 2016). Similarly, sports tourism cannot be treated like any other industry, since it has no traditional production function and no quantifiable physical products. Thus, the contribution from sports tourism events considered here will be treated as a part of the tourist sector to measure its impact at a national or a regional level.

Although economic contributions from tourism have been recognized by scholars and policy makers for a number of decades (Song et al., 2012), studies of the impact of tourism emerged as a significant and distinctive field only in the early 1990s (Artal-Tur et al., 2020). Since then, an

appreciable number of methodological approaches have been suggested for estimating the economic contribution from tourist activities. Among these may be included the application of cost–benefit analysis, Keynesian multipliers, input–output (IO) models, social accounting matrix (SAM), tourism satellite accounts (TSA), and computable general equilibrium (CGE) modelling (Klijs et al., 2012; Kronenberg et al., 2018; Saayman and Saayman, 2012).

A recent survey, conducted by Calero and Turner (2020), found that the approaches most often employed to assess the contribution from the tourism sector to the economy were the IO/SAM framework and CGE modeling. However, as these authors highlighted, empirical development of the concept of a TSA is a factor that has yielded a deeper understanding of the relevance of tourism to the national economy as a whole. As Frechtling (2010) pointed out, even though the basic idea of a satellite account is nearly four decades old, it was only in early 2008 that a consensus on the definition and data requirements for a TSA was approved by the United Nations World Tourism Organization (UNWTO) through its joint publication *TSA: Recommended Methodological Framework 2008* (United Nations et al., 2010).

According to the foreword of this TSA manual, the main purposes of this methodological tool are several. One is to provide a mechanism for analyzing in detail all the aspects of demand for goods and services associated with the activity of visitors. Another is to observe the operational interface with the supply of such goods and services within the economy. A third is to describe how this supply interacts with other economic activities (TSA; United Nations et al., 2010, p iii). Given that the definition of tourism is demand-driven, in other words, it is defined from a purchaser's perspective (TSA; United Nations et al., 2010), tourism is one of those economic activities for which the compilation of a satellite account is recommended to assess its impact (Ivandić and Šutalo, 2019).

As stated above, use of a TSA is a demand-based approach that pays special attention to a definition of tourism in which each product is tourist-related, because it serves visitors. However, this approach by itself does not reflect the total contribution made by tourism to the national economy. From a TSA perspective, the direct effects of tourism are viewed statistically only in terms of demand, while no account is taken of other factors, such as indirect and induced effects derived from supply-side activities providing products and services to the tourism sector (Ivandić and Šutalo, 2019). However, despite its limitations when measuring the total effects (Dwyer et al., 2010; Frechtling, 2010; Jones and Munday, 2008; Smeral, 2006), TSA has become the most reliable accounting method for measuring the financial contributions from tourism in the context of national and regional economies (Eurostat, 2008).

An estimate of the indirect, induced, and total financial contribution from tourism to the economy presupposes the application of quantitative models of economic analysis usually connected with the national accounts system, such as the IO/SAM and CGE models (Frechtling, 2013). As Artal-Tul et al. (2020) reported, the literature review by Polo and Valle (2012) is of use in highlighting several examples within the framework of an IO approach. These include country case studies, such as those by Baster (1980) for Scotland, by O'Hagan and Mooney (1983) and by Henry and Deane (1997) for Ireland, by Cooper and Pigram (1984) for Australia, by Jones and Munday (2004) for Wales, by Ünlüönen et al. (2011) and Atan and Arslanturk (2012) for Turkey, by Munjal (2013) for India, and by Khanal et al. (2014) for Laos.

It is well-known that IO/SAM tables⁴ constitute one of the most commonly used frameworks for measuring the economic impact of a particular industry (Miller and Blair, 2009). This influence of industries is quantified by using multiplier analysis based on the tables in question. However, such an impact can be obtained only for those industries that lie within the framework of the System of National Accounts (SNA).

As stated above, the demand-based nature of the tourism industry means that its elements are not identified as a separate account in the SNA nor as a distinct trade or industry in the IO tables. Hence, it becomes essential to achieve integration of the information contained in TSAs within the IO/SAM framework to study economic impacts through multiplier analysis. This permits assessment of the direct, indirect, and induced effects of tourism expenditure on different sectors and industries (Munjal, 2013).

According to Miranda and Andueza (2005), sports constitute one of the main tourist bases for Spaniards, fond on active tourism. The region of Castile and Leon in Spain is characterized, to a large extent, by having a territorial patrimonial system of great wealth and uniqueness. With almost six million travelers staying in its tourist establishments, where the active tourism (adventure, ecotourism, and sports), with a fairly secondary role in the regional economy at the end of the 1990s, given the impulse in public policies, have become the main actor in the active tourism sector. Hence, knowing the current role of sport in this regional economy has become relevant for the policy maker when establishing future strategic plans (JCyL, 2018).

A large number of national and international participants and attendees of sport events has caught the attention of policy makers due to its role in promoting destinations and attracting (Huang et al. 2014). Increasingly, local and regional governments are aware that sporting events have become one of the most important components of sports tourism today and are considered as drivers of economic growth in regional areas, particularly where these can be used to align with tourism activities (Rolfe, 2019). In this regard, the interest of the Regional Government of Castile and Leon has not been the exception. According to the Strategic Plan for Tourism of Castile and Leon (JCyL, 2008), tourism is not only considered as a tool to spur regional development, but sports tourism has been highlighted as one of the main axes of the Strategic Plan for Sports in Castile and Leon 2014–2017 (JCyL, 2014).⁵

In this sense, this article is intended to contribute to the emerging body of literature by bringing in explicitly four categories of sports tourism event (competitions, championships, tournaments, and leagues). The aim is to study the effects of demand from sports tourism on the economic system in terms of income and added value. Further, it examines the relative, rather than individual, impact on the regional economy of Castile and Leon by means of a fixed price multiplier model based on the regional SAM.

This proposal does not follow the usual practice of creating an additional set of final demand figures resulting from tourism. Rather, it attempts to incorporate the four categories of sports tourism event mentioned as separate components within the SAM framework, using tourism-related variables from the regional TSA, as well as the survey of average tourist expenditure carried out in the context of this research. Such an integration of the TSA and sports tourism events into a SAM model is not to be found in previous studies at a regional or national level. Furthermore, the article analyzes the interlinkages of the tourist trade with other sectors of the economy through a fixed price multiplier modeling approach. Finally, the economic impact of sports tourism on other industries is estimated through simulations conducted under a hypothetical extraction method (HEM), so as to show the relevance of sports tourism events for the economy. The results of the present study should be a weighty point for policy makers to take into account, as they provide sufficient reasons to promote sports activities and increase investment in developing them.

The overall structure of this study comprises five sections, the first being this introductory section. The second section explains the scope of the work. The third section concerns itself with the methods used in the investigation. The fourth section presents the findings from the research,

focusing on certain issues arising. Finally, the conclusion gives a brief overview, identifying areas for further research.

Economic contribution of sports tourism

Sports tourism activities under study

As noted by Weed (2008), the first definition of sports in the context of tourism is owed to Hay (1989), who identified sports tourism as those journeys made for recreational rather than commercial reasons, to participate in, or to be a spectator at, sporting activities away from the place of habitual residence. However, the most extensively accepted explanation for the term sports tourism was put forward by Standeven and De Knop (1999), who defined sports tourism as an activity. The general thrust of opinion is that sports tourism involves sport away from the home.

The definition provided by the UNWTO for tourist spending is clear, covering sums paid for the acquisition of consumer goods and services, and objects of value, for personal use, or to give as a gift, during tourist trips (Gouguet, 2002; Lisbona et al., 2008). However, there are great difficulties in measuring contributions from sports tourism, arising from the complexity of the interactions and exchange flows involved, together with the problems of delimiting immaterial and indirect effects, all this apart from the risks of double counting.

According to Gibson et al. (2018), when researchers and the tourist trade began to show an interest in sports tourism in the 1990s, there was a certain consensus on the existence of two types of tourism associated with sport: active and passive (Standeven and De Knop, 1999). The active form involved participating in a sport, while the passive version referred to travel connected with being a spectator at sporting events, whether these were major fixtures, regular seasonal programs, or one-off meetings.

In this respect, in accordance with the typology proposed by Kurtzman and Zauhar (1995), the conceptual framework used in this study adopts a broad definition of sports tourism. According to Gammon and Robinson (2003), a sports tourist activity is characterized by active or passive participation in a sporting event. This definition covers all groups of individuals who in any way take part in competitive or recreational sport, during travel to, or a stay in, any place outside their usual environment. The decision criterion is that sport is the prime motivation for traveling, while the tourism element merely acts to enhance the general experience.

For some time, sport has been becoming more significant worldwide. It is no longer an activity that serves merely to satisfy a need for leisure but has been taking on an increasingly prominent role as a driver of development. It plays a part in supply and aggregate demand in a country, influencing variables such as consumption, investment, production, employment, and income levels. This is because of the relationship that this activity has with other economic sectors such as textiles, construction, transport, and tourism, among others (see e.g. Huang et al. 2014; Ruiz Molina et al., 2010).

For this reason, it seems logical that sport, as an economic sector classified among “transverse sectors,” should be evaluated with impact techniques in analyses using the model of multipliers based on the SAM. This is because sports events bring together various activities aimed at a single purpose involving physical activity (Ruiz Molina et al., 2010), and methods for assessing sporting events would treat them as a significant component in the tourism sector (García Mesanat et al., 2013).

The SAM framework of analysis

The SAM is a system of national, regional, and subregional accounts represented in a square matrix \mathbf{T} of monetary flows, designed to provide a record of transactions using a single-entry form of bookkeeping (Miller and Blair, 2009). It includes the interindustry linkages through transactions typically found in the IO table framework. In this way, a SAM provides an extension of IO accounts that traces circular income flows, incorporating production activities, commodities, factors, the domestic and institutional sector, including households, enterprises and government, as well as the rest of the world (Pyatt and Thorbecke, 1976; Stone and Brown, 1962). It can be represented as (Pyatt, 1988):

$$\mathbf{T} = [t_{ij}], \quad (1)$$

where i is the number of the row transaction, j the number of the column transaction, and the total number of transactions, called accounts, constitutes the dimension of the square matrix. The matrix \mathbf{T} is a double-entry table, describing the structure of the economic system through its disaggregation into key blocks. By convention, all row accounts represent incomes, or resources, while the column accounts represent expenditures, or uses. Therefore, t_{ij} shows the transaction value where the income flowing into account i originates in expenditure by account j during an accounting period.

The formal framework for analyzing the effects of various economic shocks through the information contained in \mathbf{T} is a multiplier analysis, as proposed by Emini and Fofack (2004). This allows simulation of an impact analysis of the linkage between exogenous and endogenous accounts by configuring a fixed-price multiplier model typically specified by the set of equations below:

$$\mathbf{y} = \mathbf{A}\mathbf{y} + \mathbf{x} = (\mathbf{I} - \mathbf{A})^{-1}\mathbf{x} = \mathbf{M}\mathbf{x}, \quad (2)$$

where \mathbf{y} represents a vector of the real sector endogenous account totals and \mathbf{x} is a vector of the combined real sector exogenous account totals. If $\mathbf{A} \equiv \mathbf{T}(\hat{\mathbf{y}})^{-1}$ defines the matrix of average expenditure propensities and is assumed to be fixed, then \mathbf{M} is fixed. The elements of this matrix, m_{ij} , show the increase in the endogenous account, i , caused by an increment of one monetary unit in the exogenous account. In brief, equation (2) determines the total equilibrium of production, income, and final demand (consumption and investment), and the equilibrium in the capital account contained in \mathbf{y} , these being consistent with any set of injections, \mathbf{x} . In a SAM framework, the impact multiplier captures the overall effects (direct, indirect and induced) on outputs and income accounts from any given unitary exogenous shock. As is standard, equation (2) could be expressed in terms of changes in injection, using an inverse multiplier matrix. Thus, variations in income or output accounts ($d\mathbf{y}$) resulting from changes in injections ($d\mathbf{x}$) gives $d\mathbf{y} = \mathbf{M} d\mathbf{x}$.

Linkage analysis in assessing the impact of sports tourism

In the literature, interlinkage analysis is a widely accepted measure for identifying the characteristics of connectedness of economic sectors (Miller and Lahr, 2001). As was done in Cai et al. (2006), the present study performs an interlinkage analysis as a complement to classic analyses of the impact of tourism, so that the current work stands out by reason of its wider scope in examining the effects of sports tourism events on the economy. The starting point for the interlinkage analysis proposed here is the sports tourism sector. In it, backward linkage (BL) relationships determine the power of demand of the tourism sector in respect of nontourism sectors, while forward linkages (FL) measure the strength of supply from the tourism sector experienced by other sectors.

As in Lenzen (2003) and Cai et al. (2006), a BL is defined as the column averages (over inputs) $\mathbf{M}_j = \sum_i \mathbf{m}_{ij}/N$ based on the Leontief inverse matrix \mathbf{M} from equation (2), following the sense given by Rasmussen (1956) and Hirschman (1958). An FL is formulated as the row averages (over outputs) $\tilde{\mathbf{M}}_i = \sum_j \tilde{\mathbf{m}}_{ij}/N$ of the Ghosh (1958) inverse matrix $\tilde{\mathbf{M}}$.⁶ For normalization, and so as to allow interindustry comparisons, Hazari (1970) suggests relating these column and row sums to the global average $\bar{\mathbf{m}} = \sum_{ij} \mathbf{m}_{ij}/N$ as follows:

$$\mathbf{BL}_j = \mathbf{M}_j/\bar{\mathbf{m}}, \quad \mathbf{FL}_i = \tilde{\mathbf{M}}_i/\bar{\tilde{\mathbf{m}}}. \quad (3)$$

In terms of interpretation, in accordance with Miller and Blair (2009), any sector with both interlinkages greater than the average ($\mathbf{BL}_j > 1 \wedge \mathbf{FL}_i > 1$) is considered a key or generally dependent sector. In turn, those sectors having higher than average BLs ($\mathbf{BL}_j > 1$), and lower than average FLs average ($\mathbf{FL}_i < 1$), are considered dependent on interindustry supply, in other words supply dependent. The opposite case is considered dependent upon interindustry demand and may be termed a base activity of the economy. Finally, those sectors with both interlinkages below the average are considered generally independent activities ($\mathbf{BL}_j < 1 \wedge \mathbf{FL}_i < 1$).

Quantification of these interlinkages is helpful in pointing up how additional demand from the tourist trade affects other industries in the economy through BLs, and vice versa through FLs (Munjal, 2013). The stronger these interlinkages are, the more interconnected the tourism sector is to the rest of the economy (Miller and Lahr, 2001).

Hypothetical extraction method

The HEM, originally developed by Paelinck (1965), Miller (1966), and Strassert (1968), has become a widely accepted technique that extends intersectoral linkages by measuring contributions from sectors of the economy (Dietzenbacher et al., 2019). A considerable amount of literature has been published on the analysis of intersectoral linkages on the basis of HEM (Miller and Lahr, 2001), and the approach has been widely applied in numerous studies. These have examined, for example, the economy-wide influence of sectors (Perobelli et al., 2015), sectoral or regional interdependence (Guerra and Sancho, 2010), or environmental impacts (Zhao et al., 2017), among others.⁷ However, a striking observation that emerges from a review of the literature is that the first study measuring impacts in the tourism sector using HEM was the recent work by Munjal (2018), who attempted to study the relative weight of tourism by presenting such linkages in the economic system after the tourist trade is completely extracted from it, or made to “disappear,” as it were.

The accumulated body of literature on HEM has focused mainly on quantifying decreases in an economy’s total output, or other indicators, when an entire industry in that economy ceases to exist or is discounted in some way (Dietzenbacher and Lahr, 2013; Miller and Blair, 2009). Conveniently, Dietzenbacher and Lahr (2013) have recently expanded the HEM so as to handle situations when only some of the transactions in a sector are extracted.

Following their approach, the current novel research applied a partial HEM to sports tourism so as to explore the role played by sports events at a regional level, together with the quantitative interdependence between the events considered in this study and the remaining sectors of the economy. On these lines, to gain a deeper acquaintance with the role played by sports tourism activity, it was assumed that it was feasible to partition the economy into two groups or blocks of industries and trades. The first comprised those whose principal activity is the production of goods or services not related to sports tourism activities, denoted by the superscript N. The second was composed of those engaged in providing sports tourism services or products, indicated by the superscript S.

Thus, if n heterogeneous sports tourism events: championships, competitions, leagues, and tournaments, are defined, the matrix \mathbf{y} in equation (2) can be expressed by submatrices \mathbf{y}^N and \mathbf{y}^S , which would be defined as vectors of size $(m - n)$ and n , respectively. For analytical purposes, when implementing ISIC at its lower levels of detail, as here proposed, it is possible to observe and analyze the economic interactions taking place between the various different activities and n heterogeneous sports-tourism events, permitting an understanding of the interlinkages in production in an economy (TSA; United Nations et al., 2010).

Without loss of generality, the method assumes that the n -sector matrix \mathbf{A} as expressed in equation (2) can be partitioned into two groups: group one (m_S) comprises a sector that is to be extracted from the economy, while group two (m_N) embraces all the other sectors in the economy.⁸ Then, as pointed out by Dietzenbacher and Lahr (2013), the fixed-price multiplier model would be expressed as follows:

$$\begin{bmatrix} \mathbf{y}^N \\ \mathbf{y}^S \end{bmatrix} = \begin{bmatrix} \mathbf{A}_{11} & \mathbf{A}_{12} \\ \mathbf{A}_{21} & \mathbf{A}_{22} \end{bmatrix} \times \begin{bmatrix} \mathbf{y}^N \\ \mathbf{y}^S \end{bmatrix} + \begin{bmatrix} \mathbf{x}^N \\ \mathbf{x}^S \end{bmatrix}, \quad (4)$$

where \mathbf{y}^N and \mathbf{y}^S are vectors of size $m_N \times 1$ and $m_S \times 1$, respectively, discriminating between the sectors not involved in sports tourism and the sector which is, and \mathbf{x}^N and \mathbf{x}^S denote the final demand from the N sectors and from the S sector. The main idea behind HEM is to consider a hypothetical situation in which a certain sector of dimension m_S is no longer operational and to inspect the influence that this extraction exerts on the remaining $m_N(m_N + m_S = n)$ sectors in the economy (Miller, 1966; Paelinck, 1965; Strassert, 1968).

In this study, similarly to Munjal (2018), linkage measures based on the HEM attempt to quantify the loss suffered generally by other sectors as an outcome of extracting the tourist trade from the domestic economy. Extraction of sector m_1 entails $\mathbf{A}_{12} = \mathbf{A}_{21} = 0$, with the final demand for products from this sector, $\mathbf{x}_1 = 0$, yielding a new reduced form of expression (4):

$$\bar{\mathbf{y}} = \bar{\mathbf{A}}_{-m_S} \bar{\mathbf{y}} + \bar{\mathbf{x}} = \begin{bmatrix} \bar{\mathbf{y}}_N \\ \bar{\mathbf{y}}_S \end{bmatrix} = \begin{bmatrix} \mathbf{A}_{11} & 0 \\ 0 & \mathbf{A}_{22} \end{bmatrix} \times \begin{bmatrix} \bar{\mathbf{y}}_N \\ \bar{\mathbf{y}}_S \end{bmatrix} + \begin{bmatrix} 0 \\ \mathbf{x}_S \end{bmatrix}. \quad (5)$$

Here, $\bar{\mathbf{A}}_{-m_S}$ is a new input matrix with all interindustry linkages to the sports tourism sector nullified. The difference between expressions (4) and (5) provides the sectoral output losses when sector S is no longer present in the economic system. Using $\Delta \bar{\mathbf{y}}_{-m_S}$ to denote the difference between before and after extracting the sports tourism sector (termed total linkage) the resultant equations are

$$\Delta \bar{\mathbf{y}}_{-m_S} = \mathbf{y} - \bar{\mathbf{y}} = \left((\mathbf{I} - \mathbf{A})^{-1} - (\mathbf{I} - \bar{\mathbf{A}}_{-m_S})^{-1} \right) \bar{\mathbf{x}}. \quad (6)$$

The HEM approach uses the vector differences $\Delta \bar{\mathbf{y}}_{-m_S}$ to address the so-called key sectors identification problem in an interconnected economy. This is the attempt to pick out sectors with the highest potential to spread growth impulses throughout the economy (Temurshoev, 2010).

Furthermore, under a fixed-price model assumption, it becomes feasible to address the key sector identification problem by extracting tourism sector k from the system in such a way as to generate the largest possible reduction in the total linkages $\mathbf{i} \Delta \bar{\mathbf{y}}_{-m_k}$, where \mathbf{i} is the summation vector. This approach entails a sequential search extraction problem formally expressed as

$$\max \{ \Delta \bar{\mathbf{y}}_{-m_k} \mid k = 1, \dots, n \}. \quad (7)$$

As was demonstrated by Temurshoev (2010), this is a finite optimization problem, which has at least one solution. The analytical solution derived from (7) denoted by k^* is termed a key sector in literature on IO linkages.

Data and sampling method

Data issues

The regional SAM considered in this study was constructed to explain the linkages between the sports tourism sector and all the other sectors of the economy in the Castile and Leon region. The accounting scheme followed the methodological recommendations of Aray et al. (2017) for constructing an SAM for Spain and of Artal-Tul et al. (2020) for assembling the TSA into the IO framework. The resulting Social Accounting Matrix for Castile and Leon (hereafter abbreviated SAMCL) is a balanced square 119×119 matrix for 2017. This was the first SAM estimated for the region, with the added characteristic of being oriented toward the tourism sector.

Data for the real sector were obtained from the Statistical Information System of the Regional Government of Castile and Leon (principally the IO tables) and the Integrated Economic Accounts provided by the Spanish National Statistics Institute for the regional level (INE, 2018). To make an estimate of undertakings that would fall within Division 93, "Sports Activities and Amusement and Recreation Activities," of Revision 4 of the ISIC, information available in an economic and financial analysis of the companies of Castile and Leon was retrieved from the Statistical Plan for Castile and Leon 2014–2017. The remaining tourism-related variables were taken from the Spanish TSA (INE, 2018), the Egatur Tourist Expenditure Survey (INE, 2018), the Internal Tourism Survey (INE, 2018), and the Situation Reports on tourism of the Regional Government of Castile and Leon (JCyL, 2018). These various databases cover the main data sources and magnitudes relating to the number of travelers, the duration of stays in nights, and the general structure of tourist expenditure connected to the tourism sector in the region of Castile and Leon.

One of the most useful characteristics of an SAM framework is the flexibility to expand the scope of outflows and inflows which have usually been considered in the SNA for a country or a region. The SNA gives all the inputs needed to derive a complete SAM, macroeconomically balanced. It is not a question merely of introducing an alternative disaggregation of existing flows but also of breaking down the demand-driven side of the SAMCL so as to make the sports tourism sector explicit. In this regard, a specific survey was designed to cover the four types of major sporting events observed in the region of Castile and Leon, specifically: (i) championships, (ii) competitions, (iii) leagues, and (iv) tournaments.

Measuring and analyzing sports tourism events from a supply perspective requires a particular classification of products and activities. As noted above, tourism is not a separate industry among the set of 63 industries recorded in the IO tables for Castile and Leon. Rather, it is embedded within activities that are characteristic of tourism or related to it. On these lines, a supply-side definition of tourist trades is to be found in the TSA for Spain (INE, 2018) in accordance with the alignments and international recommendations for statistics relating to this field of activity. A list of tourism-characteristic and tourism-specific industries is given in Table 1.

Table 1. List of economic activities related to tourism.

ISIC Rev. 4	Division	Tourism-specific activities	Group
55	Accommodation	Hotels and similar accommodation	551
		Holiday and other short-stay accommodation	552
		Camping grounds, recreational vehicle parks, and trailer parks	553
		Other accommodation	559
56	Food and beverage services	Restaurants and mobile food service activities	561
		Event catering and other food service activities	562
		Beverage serving activities	563
49	Passenger transport services	Passenger rail transport, interurban	491
		Other passenger land transport	493
		Sea and coastal passenger water transport	501
		Passenger air transport	511
		Support activities for transportation	522
79	Travel agency, tour operator, and tour guide services	Renting and leasing of motor vehicles	771
		Travel agency activities	791
		Tour operator activities	791
91	Cultural services	Other reservation service and related activities	799
		Museums activities	910
		Other cultural activities	910
65	Other tourist services	Insurance	651
85		Sports and recreation education	855
93		Sports activities and amusement and recreation activities	931
		Other amusement and recreation activities	932

Source: Drawn up from ISIC (International Standard Industrial Classification of All Economic Activities), Revision 4, as recorded in NACE, The Statistical Classification of Economic Activities in the European Community, Revision 2.

With regard to the criteria for identifying products characteristic of tourism, this study followed the classification by division indicated in Revision 4 of ISIC, the International Standard Industrial Classification of All Economic Activities (INE, 2018). This allows a hierarchical set of economic activities in the tourist sector to be established in a similar way to the TSA. On these lines, it becomes possible to institute statistical units in accordance with the activity performed by the whole of an economic sector. Thus, it is feasible to make statistical measurements having as their reference those economic activities specific to the tourism sector (INE, 2018). In classifying goods and services, the categories in the Statistical Classification of Products by Activity (CPA 2008) recognized by the European Community were used.

Finally, in accordance with the suggestions made by Artal-Tul et al. (2020), the total expenditure employed in computing the economic impact of tourism included that arising from the total of international arrivals in these particular locations in the year 2017, as well as the average expenditure of tourists and its sectoral breakdown by industry in the IO tables. To homogenize the currency units of 2010 in the IO tables with those recording spending by tourists in 2017, gross domestic product (GDP) deflators were computed following the sectoral classification of the Regional Accounting Framework of the SNA of Spain at regional level (INE, 2018).

Table 2. Sample distribution.

Type	Championship	Competition	League	Tournament
Sporting events in Castile and Leon	771 45.9%	607 36.2%	139 8.3%	271 16.1%
On-site sample survey	11 28.9%	13 34.2%	8 21.1%	6 15.8%
Nonresident attendees surveyed	3215 46.1%	2170 31.1%	607 8.7%	989 14.2%

Source: Calculations based on data provided by the Board for Culture and Tourism of the Regional Government of Castile and Leon (*Consejería de Cultura y Turismo de la Junta de Castilla y León*).

Survey and sampling method

This universe for the sample surveyed was based on the updated directory of sporting events and the characteristics of activities, which was used in the design process for sample selection, taking into account numbers of participants. The directory was presented in the Strategic Plan for Sport of Castile and Leon 2014–2017 (JCyL, 2014). On these lines, a probabilistic sample design for sporting events was prepared covering the year 2018 in Castile and Leon, which was representative in the sense that the maximum error level was 5% ($\alpha = 0.05$). In this way, a total of 38 on-site surveys were arranged in accordance with the distribution indicated in Table 2. As have been highlighted by Jago and Dwyer (2006), it is not correct included all visitor expenditure since this leads to an overestimation of the impact measure of the event. Thus, only expenditure by visitors for whom the event was the primary purpose of the visit was included in the survey.

The 38 events selected gathered information from 6981 nonresident attendees randomly selected whose main aim was to go to the sporting event both as competitors and fans. The resulting sample was used to estimate characteristics of the total population of attendees on variables such as the mean expenditure per person (see Table 3). The total nonresident surveyed may be broken down into 3215 people (46.1%) involved in 11 championships (28.9%), 2170 people (31.1%) connected with 13 competitions (34.2%), 607 people (8.7%) taking an active or passive part in 8 leagues (21.1%), and 989 people (14.2%) with some engagement with 6 tournaments (15.8%).

The survey was based on two-stage stratified sampling. To achieve representativeness of sports activities within the framework of the SAMCL, the first stage considered the sports tourism events as primary sampling units, treated as conglomerates by variety of event (championship, competition, league, and tournament). The second stage imposed stratification according to the type of sport concerned, on the basis of the list of 49 different sports having a federation as their representative organization, according to the size distribution observable from the most recent directory of sports, from 2014.

To sum up, the design for selection used sporting events (the primary units) for the main stage of the general sample, taken according to their probability, proportional to frequency. Thereafter, the secondary stage was defined by the variety of sport concerned, again determined by the frequency of this second-stage selector. In contrast, selection of the individuals interviewed for each survey was on the basis of systematic sampling with a random start grounded in expected frequencies. The

Table 3. Estimate of average spending on tourism services by type of product (%).

Household spending (S.14)	Characteristic products	Sports tourism events					
		INE	Egatur	Champ.	Comp.	Leag.	Tourn.
Commerce	Retail trade	14.2	5.2	3.4	3.1	4.8	2.2
Transport	Land transport	4.1	11.6	3.5	3.6	1.8	3.0
	Sea and air transport	0.2	0.3	0.1	0.1	0.1	0.1
Accommodation	Accommodation services	6.3	17.6	23.8	23.6	13.4	21.5
Food and beverages	Food and beverage services	27.3	31.8	34.5	36.0	51.9	44.8
Travel agents	Travel agencies, tour operators, and similar services	1.9	3.8	2.5	2.3	3.6	1.6
Other tourist services	Insurance services	5.1	4.4	2.9	2.6	4.0	1.8
	Real estate activities	35.0	17.9	24.3	24.1	13.6	22.0
	Rental services	0.7	0.6	0.4	0.4	0.6	0.3
	Artistic creation, museum, and cultural activities	4.3	5.3	3.5	3.2	4.9	2.2
	Sports, recreational, and entertainment activities	1.0	1.5	1.0	0.9	1.4	0.6
		100	100	100	100	100	100

Source: Data from INE (the Spanish National Statistics Institute) relate to the Tourism Satellite Account. Figures from Egatur (the Spanish Survey of Tourist Spending) refer to the specific results of a survey for Castile and Leon. The figures by type of event were calculated by the authors.

minimum admissible sample for each type was required to be such that the maximum sampling error would be less than 3% of the total for a confidence level of 95% (estimate of assumed proportions $p = q = 0.5$).

In respect of the outlays declared by those attending the different types of event, Table 3 shows their average distribution. This highlights that in percentage terms expenditures on accommodation and on food and beverages reach the highest values, ranging from 23.8% on accommodation in connection with championships to 51.9% on food and beverages in relation to leagues.

Discussion and summary of findings

The objective of this study was to attempt to gain an overview of the role that sports tourism events have in the region of Castile and Leon. The analysis focused on two main issues. The first was the interlinkages between the sports tourism sector and the rest of the economy. The second was an assessment of their economic impact using the HEM approach. Both issues aid in understanding the contribution that sports tourism makes to the region.

Figure 1 presents a structural classification based on the forward (Leontief) and backward (Ghosh) supply-driven multipliers for the 83 industries considered in the SAMCL 2017. As might be expected, the tourist trade is better placed in respect of FLs than of BLs in comparison with other industries, thus being consistent with what was recorded for the tourism sector in Spain as a whole (Artal-Tur et al., 2020; Cansino et al., 2013; Pérez et al., 2009).

Examination of the results in detail, as recorded in Table 4, shows that seven sectors characteristic of tourism are classified as “key” to the economy of the region on the basis of their

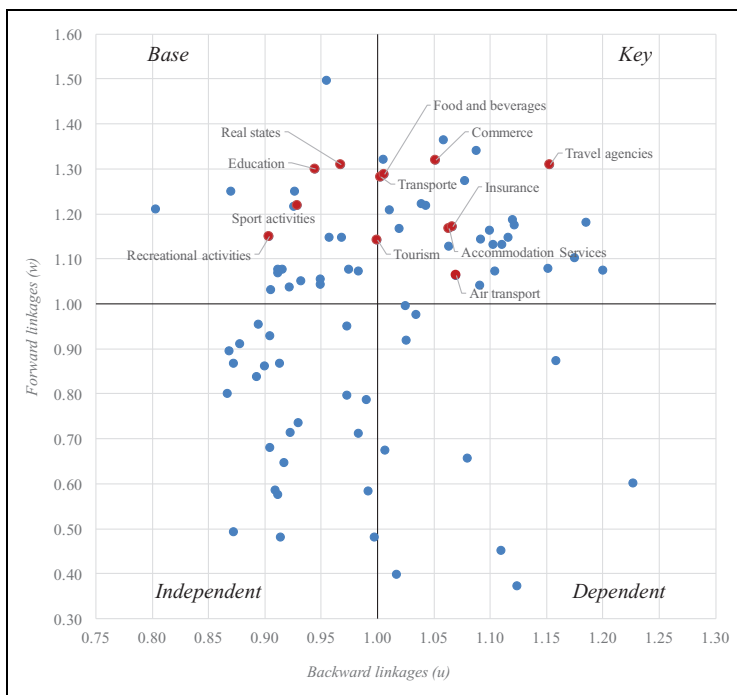


Figure 1. Backward and forward linkages in Castile and Leon.

Table 4. Classification of key tourism-related sectors of the economy.

Characteristic activities of the tourism sector		Linkages		Classification
		BL (Rank)	FL (Rank)	
Commerce	Retail trade	1.32 (01)	1.05 (05)	Key
Transport	Land transport	1.28 (06)	1.00 (08)	Key
	Sea and air transport	1.06 (12)	1.07 (02)	Key
Accommodation	Accommodation services	1.17 (08)	1.06 (04)	Key
Food and beverages	Food and beverage services	1.29 (05)	1.01 (06)	Key
Travel agents	Travel agencies, tour operators, and similar services	1.31 (02)	1.15 (01)	Key
Otder tourism services	Insurance services	1.17 (08)	1.07 (02)	Key
	Real estate activities	1.31 (02)	0.97 (09)	Base
	Artistic creation, museum, and cultural activities	1.15 (10)	0.90 (12)	Base
	Sport activities	1.22 (07)	0.93 (11)	Base
Tourism	Education	1.30 (04)	0.94 (10)	Base
	Tourism services	1.14 (11)	1.01 (07)	Key

Source: Own calculations.

Table 5. Total impact on gross production in Castile and Leon measure of loss to the economy after extraction (% loss).

Characteristic activities of the tourism sector		Type of sports event				Sports tourism
		Champ.	Comp.	Leag.	Tourn.	
Commerce	Retail trade	0.53	0.33	2.36	0.74	3.90
Transport	Land transport	0.44	0.29	1.34	0.63	2.65
	Sea and air transport	0.57	0.37	1.72	0.82	3.41
Accommodation	Accommodation services	1.77	1.14	6.73	2.87	12.29
Food and beverages	Food and beverage services	1.44	0.95	7.22	2.63	12.04
Travel agents	Travel agencies, tour operators, and similar services	0.42	0.27	1.36	0.63	2.63
Other tourism services	Insurance services	0.71	0.44	3.20	0.94	5.19
	Real estate activities	0.90	0.57	2.71	1.32	5.39
	Artistic creation, museum, and cultural activities	0.84	0.51	4.13	1.03	6.39
	Sport activities	0.37	0.23	1.48	0.57	2.61
	Education	0.50	0.31	2.26	0.68	3.69
Tourism	Tourism services	1.36	0.87	5.11	2.13	9.31

Source: Own calculations.

weighting, sensitivity to dispersion, or both (retail trade, land transport, other transport, accommodation, food and beverages, insurance, and travel agencies and similar). In contrast, four tourism-related sectors are classed as “base” sectors (real estate activities, education, sport, and the recreational and entertainment activities termed artistic creation, museums, and cultural activities).

These results suggest that the sensitivity of the tourism sector to changes in production in other sectors is greater than its capacity to induce production in the economy. In other words, the relative impact of the contribution of tourism to the economy as a whole is to be explained mainly by a drag effect from household consumption demand on tourism activities.

With regard to the results of a hypothetical extraction, the percentage loss that would be suffered by the tourism-related sectors of the economy arising from the conjectural disappearance of a sports tourism event is given in Tables 5 and 6. The SAMCL as configured here allows quantification of the total effect of the extraction, broken down into a series of sub-effects on the basis of the type of event. In this study, the outcomes are presented in terms of the direct impact on gross output and the total effect on the GDP of Castile and Leon by activities characteristic of sports tourism.

As has been pointed out by Munjal (2018), such hypothetical circumstances are highly improbable for many sectors, such as manufacturing. This is also the case for several areas of provision of services, but not for tourism. A country like Spain, which depends heavily on the tourist trade, would be likely to suffer considerable losses if faced with extreme scenarios such as terrorist attacks, pandemics, or natural disasters.

The results reported in Table 4 indicate that the sports tourism sector enhances the overall output of the economy by a factor of 1.14 units when its demand increases by 1 unit, in accordance with its BLs. On the other hand, its disappearance would cause gross output to fall by 9.31% (Table 5). The most significantly impacted sector would be accommodation services, with a predicted

Table 6. Total impact on the Castile and Leon gross domestic product measured as losses to the economy if extracted (% loss).

	Code	Concept	Type of sporting event				Sports tourism
			Champ.	Comp.	Leag.	Tourn.	
Demand approach	P.3l	Household/NPISH consumption	1.77	1.03	2.43	2.31	7.67
		Household tourism consumption	0.99	0.63	3.91	1.54	6.96
	B.1	Gross value added	0.44	0.28	1.71	0.67	3.05
Income approach	D.1	Payments to employees	0.35	0.22	1.38	0.54	2.45
	D.2	± Taxes and subsidies	0.50	0.32	1.99	0.79	3.54
	B.2b	Gross operating surplus	0.50	0.32	1.99	0.79	3.54
	B.1b	Gross value added	0.44	0.28	1.71	0.67	3.05
Production approach	P.1	Production at basic prices	0.40	0.26	1.58	0.62	2.81
	P.2	Intermediate consumption	0.36	0.23	1.46	0.58	2.59
	B.1b	Gross value added at basic prices	0.44	0.28	1.71	0.67	3.05
	B.1b	Gross value added	0.44	0.28	1.71	0.67	3.05

Source: Own calculations.

shrinkage of output by 12.29%. Moreover, the greatest relative impact of any assumed disappearance of championships, competitions, and tournaments would fall on this sector, at 1.7%, 1.14%, and 2.8%, respectively. The absence of leagues would have its strongest effect on the food and beverages, with a forecast fall of 7.22%.

On the basis of the results in Table 6, it may be concluded the impact from the types of event considered on the various components of gross output in Castile and Leon would have a total effect on household consumption of 7.7%, measured by the final demand approach. Similarly, use of an income approach would indicate an impact of 2.4% on the remuneration of employees and of 3.5% on the gross operating surplus of the economy of Castile and Leon. Consequently, the direct impact of sports activities on the GDP at basic prices may be measured as lying around 2.8%, thus translating into the remainder of the economy as a total impact of 3.1% on the economy of Castile and Leon as a whole.

When these results are broken down by type of event, it can be seen that the greatest effect from sporting activities is that associated with leagues. Their direct impact is 1.5% and their total impact is 1.7%. Next come tournaments, with a direct impact of 0.6% and a total impact of 0.7%. There is a direct impact of 0.4% from championships, their total impact also being 0.4% with rounding. Competitions have 0.2% of direct impact and 0.3% of total impact. These figures can be derived from Table 6.

Although the role of sport in the economy, and in particular in the tourism sector, has long been recognized (Miranda and Andueza, 2005), results with which to compare the weight of sport for regions like Castile and Leon are scarce. Relatively few studies have been carried out on the sports activity sector in Spain. As Martínez and Romo (2015) have reviewed, few studies have been conducted at a national level, such as those carried out by Alonso et al. (1991) and Lera et al. (2008), and similarly few studies have considered a regional approach (Bosch et al. (2019)).

Among those regional studies, it is possible to find studies like the conducted by Bosch et al. (2012), who estimated that the weight of the sport sector reached 2.1% of GDP for the region of Catalonia. In the same vein, Rapún (2003) reported that the employment generated by the sector accounts 1.7% of the total occupation and its contribution to GDP reached 0.8% in the region of

Navarra. Similarly, the KPMG Consulting (2002) study for the Basque Country concluded that the wealth generated by sports activities represented 1.9% of GDP. Finally, in the region of Andalusia, the most recent study of Instituto de análisis económico y empresarial de Andalucía (2010) have found that the economic contribution of sport has reached 3.5% of GDP.

In the particular case of Castile and Leon, the closest study that we can find corresponds to the work of Pedrosa Sanz (2001), which estimated that consumption in sport represented 2.5% of total final demand and the economic contribution of sport reached 1.4% to GDP in 2000. Thus, despite the remoteness of these results, the weight gain of the sports in the region results remarkable, when the results of almost two decades ago are compared with those found by this research.

Conclusion

The present study confirms and quantifies the impact of the contribution from sports tourism to the regional economy. Its results constitute a first attempt to set characteristic sporting events as a separate sector into the framework of the supply and use tables, and subsequently in the SAM tables, using the outcomes obtained from the TSA and other surveys of tourists. The approach adopted here was to examine tourism within the framework of a regional SAM model, extended to comprise a set of sports tourism events (championships, competitions, leagues, and tournaments). This article shows that an understanding of regional transactions attendant upon sporting events can be a useful aid in planning strategies for such events as well as for tourism in general.

According to Kronenberg et al. (2018), it is rare for multiplier models to be readily available at a subnational level, thus being the fundamental reason impeding regional applications. However, the modeling of regional economies is especially crucial to reflect peculiarities of regions. For instance, regional sports tourism events usually differ significantly from their national counterparts (Miller and Blair, 2009). Region-specific models also provide valuable insights into regional industrial capacities, as multipliers indicate the level of self-sufficiency of a sector (Miller and Blair, 2009; Scott and Storper, 2003). More specifically, economic sectors in regions with relatively low multipliers require higher rates of importation, resulting in considerable leakages. In contrast, those in regions with higher levels of multipliers are characterized by greater self-sufficiency and lower leakages (Stabler et al., 2009).

Modeling the contribution of tourism through the integration of TSA and IO/SAM tables is considered one of the most significant bases for conducting economic analyses of the sector. However, it is necessary to take account of the limitations of this modeling approach (Kronenberg et al., 2018).

One common limitation noted in most IO/SAM studies of tourism is that the basis for analysis is provided either by the most recent available data covering a single calendar year (Kim and Kim, 2015; Ünlüönen et al., 2011) or by a comparison of data from two calendar years separated by a gap which may be several years in length (Sun and Wong, 2014; Surugiu, 2009). On these lines, some researchers have tended to argue that the underlying IO/SAM models considered in economic analyses of tourism are often outdated, since databases are published only infrequently (Kronenberg et al., 2018).

Another limitation is the debate regarding the economic impact methodology used. In general, sport events are perceived as a way to promote economic growth, given that economic impacts studies commonly found a positive economic effects (McCartney et al. 2010). However, it is also known that the IO/SAM outcomes lead to an upward bias, given that this approach ignores potential negative impacts (Papanikos, 2015).

For example, considering a cost–benefit analysis, Wan and Song (2019) have found evidence that the cost of infrastructure investments and promotion may outweigh the benefits generated by the

major sport events. However, as this authors have warned, due to the difficulty involved in obtaining measurements of scale and intangible benefits/costs, this approach has seldom been used. Furthermore, as Dwyer and Jago (2012) have indicated, although cost–benefit analysis manages to address the scope of the net impact benefit for a specific region of the event itself, it is not capable of measuring the impact on economic activity from the event or the wider flow-on effects.

The aforementioned is relevant since an economic impact analyses attempt to answer the question of how may external flow of income enter in a regional for a set of events, and how much the new flow serves as a tool to spur the regional economic development (Freeman and Brewer, 2017). Regional and local governments are regularly called upon to finance sporting events; however, economic appraisal to evaluate those investments, despite having a clear public interest, are generally very limited, so the results of this research are an attempt to solve this circumstance.

While understanding the potential limitations of IO/SAM approach, it appears to be appropriate for most economic impact analysis (Huang et al., 2014). Even so, the results here presented should be read with due caution. They refer to the response of a tourist demand impulse within the framework of general equilibrium and should not be understood as an *ex ante* measurement to promote a particular sport event at a regional level.

Furthermore, this type of modeling is criticized on the basis of the underlying assumptions behind the impact of fixed price multipliers derived from IO/SAM tables. These include the ideas that industries have linear input structures, produce one representative good or service, exhibit constant returns with changes of scale, and are capable of bringing to bear unlimited labor and capital resources (Miller and Blair, 2009). To address these limitations, some proposals base their studies on the use of CGE models by applying a system of equations directly derived from neo-classic economic theory (Kronenberg et al., 2018).

The CGE model is considered to have the broadest reach (Song et al., 2012) and it also allows some of the restrictions of the IO/SAM model to be overcome (Baggio, 2019; Dwyer et al., 2004). However, the complexities arising from additional assumptions about market agents and clearance mechanisms make comparisons and verification of CGE models, as well as communication and dissemination of their findings, particularly difficult (Hara et al., 2008; Klijs et al., 2012). Moreover, there is still a relationship between CGE modeling and IO-based frameworks, as it is dependent upon SAMs for its core data input. Hence, the limitations mentioned above are also limitations affecting a CGE approach (Kronenberg et al., 2018). The complexity arising from the additional assumptions and limitations present in a CGE model become more evident when it is desired to explore in more detail the tourist trade within the ambit of active tourism. This is particularly true for tourism associated with sporting events.


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Notes

1. Events with the duration of one day are treated as competitions, with the duration of more than one consecutive day are treated as tournaments and those carried out over different, nonconsecutive days are treated as championships. Competition systems where participants play against each other are treated as leagues.
2. For a systematic review of the literature of the economic impacts of major sport events, see McCartney et al. (2010).
3. A comprehensive review of articles analyzing the economic impact of a single event can be found in the works of Li and Jago (2013) and Salgado et al. (2018).
4. Social accounting matrices, as an extension of the input–output framework, incorporate a comprehensive view on the economy by considering in detail the (disaggregated) roles of households, factors of production, and institutional sectors (Miller and Blair, 2009).
5. Tourism is considered as a strategic sector at the regional, county level, and in urban strategic plans, as stated in the Strategic Tourism Plan for Castilla y León, 2009–2013 (JCyL, 2008: 5): “The tourism sector in Castile and Leon must be considered as a strategic group within the regional economy, exercising a leadership position in creating development that improves the quality of life of the municipalities and of the people who are part of this Autonomous Community.”
6. The alternative inverse formulation of the interindustry model suggested by Ghosh (1958) is based on its direct sales coefficients matrix. $\tilde{\mathbf{A}} = \hat{\mathbf{y}}^{-1}\mathbf{T}$. As has been shown by Lenzen (2003), the fundamental equation in this model links exogenous primary inputs \mathbf{v} with total output such that $\mathbf{y}' = \mathbf{v}(\mathbf{I} - \tilde{\mathbf{A}})^{-1} = \mathbf{v}\tilde{\mathbf{M}}$.
7. See Miller and Blair (2009) and Dietzenbacher and Lahr (2013) for insights and extensions.
8. The results can then be referred to a single sector by assuming $m_1 = 1$

Supplemental material

Supplemental material for this article is available online.

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