Evolution of Tourism in the world economy 2005-2015: an analysis through the ICIO tables from OECD

Casiano Manrique-de-Lara-Peñate
Elisabeth Valle Valle
Ana López-Ojeda

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Abstract:

The importance of tourism has been consolidated in the world economy over the last decades. Tourism has become one of the world's leading economic activities, growing from 3.26% of global GDP in 2010 to 4.1% in 2019. However, due to COVID19, in 2020 it drops to 1.8% (UNWTO, 2023). In relation with tourists' arrivals, it grew from 957.2 million in 2010 to 1465.8 million in 2019. During the pandemic the arrivals dropped to 409.1 million in 2020 and recovered until 917million in 2022 (UNWTO, 2023). This growth of the sector has had an effect much longer on the world economy and trade patterns. The analysis and monitoring of its evolution is crucial. Authors as Polo and Valle (2012) affirm that a close relationship has existed between tourism analysis and Input-Output Tables (IOT) and models (IOM) for a long time. The great tradition existing in the use of input output tables to analyse tourism, is now reinforced by the existence of Inter Country Input-Output Tables (ICIO) for 67 countries (38 OECD countries and 28 non-OECD economies), the Rest of the World and split tables for China and Mexico and 45 industries from 1995 to 2015 from the OECD. The ICIO database shows the consumption of non-residents separated from those of the residents thanks to which the value added created by tourism expenditure by country of origin has been analysed for all the countries included in the database (OECD, 2019). This is precisely our starting point.
The contribution of this article is to extend the analysis for the entire period 2005-2015, what will allow us to analyse the evolution of the weight of tourism internationally, the impact of the crisis on tourist flows and the intra and inter-country cross-sectoral tourism relations, as well as the impact of the carbon emissions related with tourism. In this respect for the time being we plan to concentrate in emissions related to air transport of tourists.

Introduction

Tourism has played a significant role in the global economy, becoming a major contributor to economic growth, revenue generation, employment creation, and foreign exchange earnings. The growth of international tourist arrivals, as evidenced by the increase from 208 million in 2005 to 1208.9 million in 2015, has been accompanied by increased focus and attention from governments and international organizations on tourism as a policy priority.

Countries around the world have implemented various tourism policies, developed infrastructure, and launched marketing campaigns to attract tourists and boost their tourism industry. This growth in tourism has not only impacted the tourism sector but has also had direct and indirect effects on the overall economy and the generation of value-added.

One significant indicator of the economic impact of tourism is the share of total exports and service exports. The share of total exports from tourism has risen from 6.2% in 2010 to 7% in 2019, indicating that tourism has become an increasingly important export sector for many countries. Similarly, the share of service exports from tourism has remained significant, accounting for 30% in 2010, 29% in 2015, and 28% in 2019.

The growth of tourism has also resulted in the creation of employment opportunities in various sectors such as hospitality, transportation, attractions, and other tourism-related businesses. This has contributed to job creation, income generation, and poverty reduction in many countries, particularly in regions with limited economic diversification.

Furthermore, the indirect impacts of tourism on the economy are also noteworthy. Tourism generates demand for goods and services from other sectors of the economy, such as agriculture, manufacturing, and construction, creating inter-industry linkages and stimulating economic activity. This can have multiplier effects, leading to increased economic output and income.

In conclusion, the growth of tourism has had a significant impact on the global economy, contributing to revenue generation, employment creation, and foreign exchange earnings. The direct and indirect impacts of tourism have not only benefited the tourism sector but have also influenced the overall economy and the generation of value-added, making it a key focus area for governments and international organizations in their policy and development efforts.

The great tradition existing in the use of input output tables to analyse tourism, is now reinforced by the existence of Inter Country Input-Output Tables (ICIO) for 69 countries and 36 industries from 1995 to 2018 from the OECD. There are other global multiregional input-output databases developed recently, (in alphabetical order): Eora (Lenzen et al, 2013), EXIOPOL (Tukker et al, 2013), Global Trade Analysis Project (GTAP) (Aguiar et al, 2019) or World Input-Output Database (WIOD) from the European Commission (Timmer et al, 2015). A historical context of global multiregional input-output frameworks and its applications is provided in Wiedmann et al (2011) and Tukker and Dietzenbacher (2013). Lenzen et al (2017) describe the creation of a global multi-

region input-output (MRIO) Lab, a cloud-computing platform, to generate a set of global MRIO databases expressed in the regional and sectoral classifications of the EXIOBASE, WIOD and Eora tables.

However, from the tourism point of view, the ICIO database calculates for the first time the consumption of non-residents thanks to which the value added created by tourism expenditure by country of origin has been analysed for all the countries included in the database (OECD, 2019). This is precisely our starting point. The contribution of this article is to extend the analysis for the entire period 2005-2015, every year, which will allow us to analyse the evolution of the weight of tourism internationally, the impact of the crisis on tourist flows and the intra and inter-country cross-sectoral tourism relations.

Literature review

For a while now, Tourism analysis has been closely associated with Input-Output Tables (IOT) and models (IOM), as noted by Polo and Valle in 2012. Despite some drawbacks in utilizing IOT for policy modelling, they remain an invaluable tool for descriptive analysis, as they capture the goods and production accounts of any economy.

Leontief initially introduced Input Output analysis in 1936, while Archer's work in 1978 represents one of the earliest applications of impact analysis for the tourism sector using IO multipliers. In his research, Archer explored the concept of tourism multipliers and examined the advantages and disadvantages of such models.

Fletcher (1989) reviews the advantages and disadvantages of using input-output analysis to measure the economic impact of tourism. The comprehensive description of the economy, the capacity to consider inter industry links, the possibility to use ad hoc sectoral aggregations and the ability to evaluate three levels of impact -direct, indirect and induced- are cited by the author as the main advantages of these models. The rigidity implied by the use of a single representative consumer, the fact that competitive and non-competitive imports are not distinguished, the lack of capacity constraints and the high amount of data needed to build IO tables and models are the main inconvenient identified by the author. This lack of capacity constraints is also considered by Briassoulis (1991), who also warns about the rigidities that are implied by the use of linear homogeneous production functions (constant technical and distribution coefficients, constant returns to scale, no inputs among inputs).

Most of the applications use the demand model, but there are also studies using the price model in the context of the tourism sector. This is the case of Logar and Van Den Bergh (2013). They use the IO price model to calculate the increase in the output prices resulting from increases in the prices of energy providers alone and together with increases in capital and labour costs. The resulting changes in the prices of the tourism sectors were used, together with tourism demand models, to estimate the changes in international tourism demand in Spain. A demand driven model was then used to estimate the impact in the Spanish economy induced by these changes in tourism demand. IO demand models have been also used for the calculation of the economic impact of special tourism related events. Lee and Taylor (2005) represent a valuable

example of events' evaluation. In this particular field of study, the main problems arise not linked to the previously commented drawbacks of the IO model but in relation to the way the direct expenditures associated to the event are calculated. Tyrrell and Johnston (2001) allude to the origin of one of the main problems in this area, the confusion in distinguishing between event and tourism impact. Gross and net economic impacts need be clearly identified.

Some examples of multiregional models applied to tourism can be found in the works of Manente (1999) that analysed the tourism impact in ten regions in Italy, Freeman and Felsenstein (2007) estimate regional responses to an increase in demand of 100000 extra tourist in terms of additional hotel rooms and capital investment for four classes of hotels in six regions of Israel or Ferreira et al (2022) estimate economic impacts of red tides in two regions in Florida through the shock in the Airbnb market.

Tourism, input-output model, and multiregional input-output model appear in many research efforts related to environmental issues. This is the case of the work undertaken by Lenzen et al. (2018) to calculate the carbon footprint of global tourism. They combine the information provided by tourism satellite accounts, integrated into a multi-region IO table, to estimate the carbon footprint of the tourism flows using IO models. Cai (2016) calculates direct and indirect greenhouse gas emissions embodied in tourist consumption of goods and services applied to South Tyrol. Sun (2014) combines the use of tourism satellite accounts with an environmentally extended IO model to calculate the direct, indirect and induced effects that are due to tourism demand. Sun (2016) adds structural decomposition analysis (SDA) to the previous effort. SDA allows to calculate different sources of the direct and indirect tourism GHG effects like intensity, structure final demand and Leontief effects. Tang and Ge (2018) used an Input-Output model to calculate the carbon emissions resulting from tourism consumption in Shanghai in 2012, finding that tourism carbon costs represented a higher rate of GDP than tourism direct gross value added. Similar results are found by Bouwmeester et al. (2014) for the EU27 exports between 2000-2007. In Spain, Cadarso et al (2015) quantify the carbon footprint linked to residents' and visitors' tourist consumption in the Spanish economy through an input-output model and in Cadarso et al (2016) the concept of tourism's carbon footprint is expanded to include emissions linked to the production of capital goods required for tourism goods and services to this sector.

Dwyer, Forsyth, and Spurr (2004) point out that Input-Output (IO) models have been surpassed by computable general equilibrium models (CGE), which can incorporate all types of price effects and income flows, allowing for more flexible modelling. Zhou, Yanagida, Chakravorty, and Leung (1997) also highlight the main problem of IO models, which is price rigidity that limits resource reallocation and modelling flexibility. Blake and Sinclair (2003) discuss the pros and cons of IO versus CGE models, noting that rigidities reduce the usefulness of IO models in policy analysis. In contrast, CGE models can easily integrate taxes and subsidies to compensate for tourism crises and evaluate different demand and supply responses and hypotheses about public and foreign sector deficits, without being constrained by price and wage inflexibility. However, Dwyer also acknowledges that there are criticisms against using CGE models in tourism research, including the lack of a standard CGE model (WTO, 2015).

It is a well-established fact that IO models continue to be extensively utilized in the economic impact analysis of tourism. Los and Steenge, (2010) make a broad interpretation of IO analysis since they do not limit its area of influence to the static open Leontief model and describe the area of tourism-IO as a "blossoming field" of study. They identify a series of relevant pieces of work in the area of tourism related to impact analysis that use input output methodology.

IO models remain a commonly used approach for conducting a preliminary analysis of the impact of the tourism sector on the economy, despite the availability of alternative analytical techniques. Several recent examples of this type of analysis are Klijs, Ormond, Mainil, Peerlings, Heijman (2016), Pintassilgo, Rosselló, Santana-Gallego, Valle (2016), De Santana Ribeiro, Da Silva, De Lima Andrade, De Souza (2017), Guo, Robinson, Hite (2017), Ivandic Sutalo (2018) and Tohmo (2018).

It is clear that there are many ways to approach the analysis of the economic impact of tourism. However, whatever the model type, in one way or the other, most seem to rely in input-output tables and data. A good example of these different ways to approach the same reality is the case of the research done by Polo and Valle (2008), Polo and Valle (2016) and Soulie and Valle (2014). These authors study the tourism in the Balearic Islands under different perspectives using regional input-output tables, Sam multipliers, a CGE model and an inter-regional model, originally proposed by Isard (1951), with two geographical areas, Balearic Islands (heavily specialized in tourism) and the Rest of Spain. The four models should not be considered excluding alternatives but different complementary ways to use input output tables in the analysis of tourism activities.

The starting point of this article is the publication by Alsamawi et al (2021) where they measure the value added generated by each country as a consequence of direct purchases by non-resident through a global inter-country input-output approach, the OECD-ICIO framework, in years 1995 and 2011. The objective in this article will be to analyze the evolution throughout the entire period, extending up to 2018.

The Inter Country Input Output Tables (ICIO) from the OECD

The structure of Input-Output Tables (IOTs) illustrates the economic relationships between producers and consumers through their buying and selling activities within an economy. The table is symmetrical and can be divided into three main matrices: the intermediate consumption matrix, the final demand matrix, and the primary input matrix. The format of the harmonized national input-output tables established by the OECD can be seen in Figure 1.

Figure 1. **Format of OECD harmonised national Input-Output Tables**

Format of OECD harmonsied national Input-Output Tables

	Symmetric *industry-by-industry* I-O table	Intermediate demand			Final expenditure			Direct purchases abroad	Output (bp)
		Industry 1	...	Industry 36	Domestic demand	Cross-border exports	Direct purchases by non-residents		
1	Industry 1 (domestic, bp)								
..	...								
36	Industry 36 (domestic, bp)								
37	Product 1 (imports, bp)								
..	...		A		B	C	D	E	
72	Product 36 (imports, bp)								
73	Taxes *less* subsidies in intermediate and final imported products								
74	Taxes *less* subsidies on intermediate and final products paid in the domestic territory								
75	Total intermediate / final expenditure (pu)	Sum of (1:74)	..	..					
76	Value-added (bp)								
77	Output (bp)								

GDP (expenditure approach)
GDP (output approach)
pu: purchasers' prices
bp: basic prices

A: Imports of intermediate products
B: Imports of final products
C: Re-imports and re-exports
D: Imported products for non-residents expenditures
E: Direct purchases abroad of foreign products by residents

Imports are valued at basic prices of the country of origin, i.e. the domestic and international distribution included in goods imports in c.i.f. purchasers' prices are re-allocated to trade, transport and insurance sectors of foreign and domestic industries. Taxes paid and subsidies received in foreign countries are excluded from row 37 to row 72 and shown separately in row 73.

Source: OECD

Using these tables, one can employ the standard input-output demand model to calculate a production vector that satisfies a pre-determined final demand vector. As IOT distinguishes flows by origin, the equilibrium condition between production and uses by sector is set as follows:

$$y = A^I y + d^I \qquad [1]$$

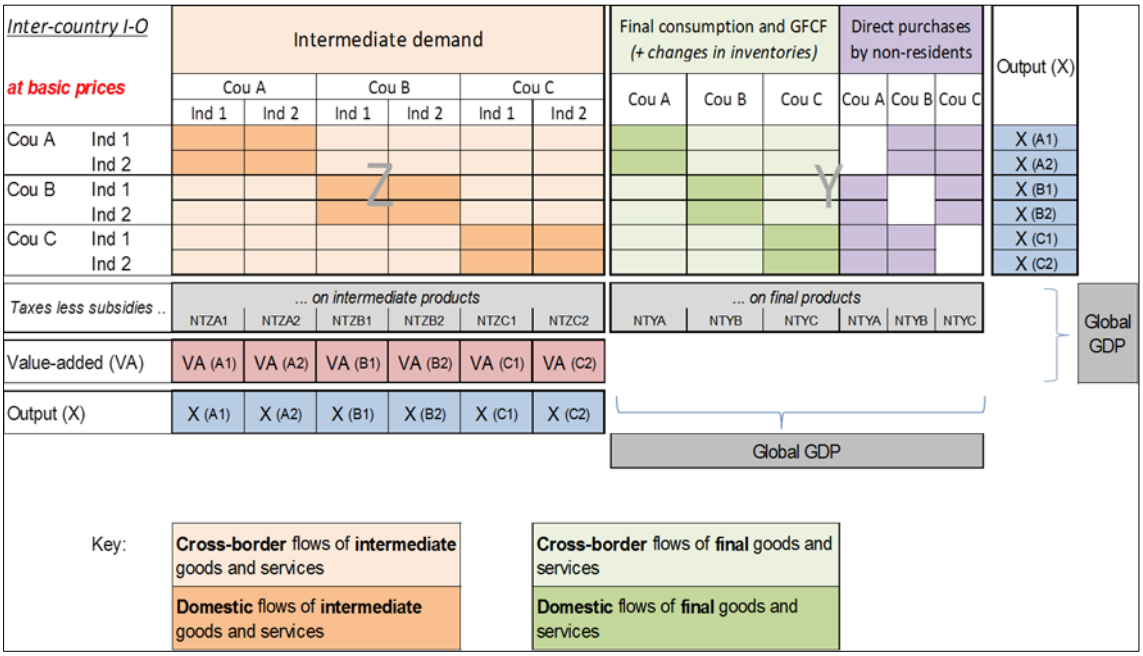
where A^I is the matrix of domestic intermediate input coefficients and d^I the vector of domestic final demand. To obtain an estimate of the production associated with tourism y_T, equation [1] is solved for the pre-determined final demand vector, d_T^I, which represents the demand for goods and services by tourists:

$$y_T = A^I y_T + d_T^I . \qquad [2]$$

One can use technical coefficients and activity levels to calculate intermediate consumption, value-added, employment, and imports resulting from tourism in each branch. This enables the calculation of the share of tourism on value-added or employment for the entire economy. An inter-regional input-output table follows the same basic layout as a single input-output table but includes two types of industries:

those located in the region of focus and those outside it. This duplicates the number of industry rows and columns. The OECD has created inter-regional input-output tables for 69 countries and 36 industries from 1995 to 2015. Figure 2 provides a schematic representation of this effort. Both regions in the table have the exact same set of industries.

Figure 2. Format of OECD Input-Output Tables



Source: OECD

Using the framework established by Isard (1951) and elaborated by Isard et al. (1960), Miller and Blair (1985), Hara (2008), and Miller and Blair (2009), we designate the two countries under study as r and s. In this notation, the inter-country input-output table can be divided into lower-order sub-matrices, as shown in the following expression:

$$Z = \begin{pmatrix} Z^{rr} & Z^{rs} \\ Z^{sr} & Z^{ss} \end{pmatrix} \quad F = \begin{pmatrix} F^{r} \\ F^{s} \end{pmatrix} \quad [3]$$
$$V = \begin{pmatrix} V^{r} & V^{s} \end{pmatrix}$$

The sub-matrix, $\mathbf{Z^{rr}}$,represents intra-country transactions, meaning it describes the outputs of industries within a country that are used as inputs by other industries within the same country. This sub-matrix corresponds to the inter-industry matrix found in a single national input-output table. On the other hand, the sub-matrix, $\mathbf{Z^{ss}}$, describes extra-country transactions between industries located outside of the country. This means that it describes outputs produced outside the country but used as inputs by industries also located outside the country. Inter-country flows are captured in sub-

matrices $\mathbf{Z^{rs}}$ and $\mathbf{Z^{sr}}$, which represent flows from the country (r) to the rest of the world (s) and from the rest of the world (s) to the country (r), respectively.

Additionally, final demand is divided into two matrices: $\mathbf{F^r}$, which includes final demand from within country r, and $\mathbf{F^s}$, which includes final demand from the other country being considered. Similarly, value-added vectors are also divided into $\mathbf{V^r}$ and $\mathbf{V^s}$. The interpretations of matrices Z, F and V are the same as described for a single input-output table. However, the level of disaggregation in this combined input-output matrix includes country distinctions, which allows for the examination of the links between countries.

The equilibrium condition for production and use by sector and country **r** and the rest of the world **s** is set by the equation:

$$\left\{\begin{bmatrix} I & 0 \\ 0 & I \end{bmatrix} - \begin{bmatrix} A^{rr} & A^{rs} \\ A^{sr} & A^{ss} \end{bmatrix}\right\} \begin{bmatrix} x^r \\ x^s \end{bmatrix} = \begin{bmatrix} f^r \\ f^s \end{bmatrix} \quad [4]$$

The complete matrix for a two-inter-country input-output model is $\begin{bmatrix} A^{rr} & A^{rs} \\ A^{sr} & A^{ss} \end{bmatrix}$. As compared to the single model, the complete (I-A) matrix for the two-countries model will be larger. If n sectors are considered for each country, then the size of the single matrix would be n×n. However, for the full two-countries model, the size of the matrix would be 2n×2n.

The Inter Country Input Output Tables (ICIO) from the OECD consider 69 countries (as shown in appendix 1) and 36 industries (as shown in appendix 2). Therefore, the total number of sectors that will be considered is 2484.

Results

The ICIO database calculates for the first time the consumption of non-residents thanks to which the added value created by tourism expenditure by country of origin has been analysed for all the countries included in the database (OECD, 2019). That is precisely our starting point.

In table 1, we can observe the tourist demand collected in the ICIO tables for the year 2015. The rows show the origin, and the columns show the destination of the tourist demand. In this way, we can see in the first row of table 1 that the total tourist demand from Africa was 2187 and was concentrated in first place in USA&Canada (697) and in second place in Europe (505). Globally, the tourist demand that Europe makes within the continent stands out (164507), followed at a distance by the tourist demand that Asia makes within Asian countries (82590) and the demand that Asia makes in USA&Canada (50311). The tourist demand from Europe to USA&Canada (36669) and the tourist demand from USA&Canada to Europe (36473) are in fourth and fifth place, respectively.

Table 1: Tourism demand 2015 (millions USD)

	Africa	Asia	Europe	Latin America	Near East	Oceania	ROW	USA&Canada	Total general
Africa	14	429	505	20	410	112	0	697	**2.187**
Asia	1.694	82.590	14.065	1.563	3.777	16.470	0	50.311	**170.469**
Europe	2.346	19.675	164.507	1.905	21.337	3.832	0	36.669	**250.300**
Latin America	108	1.162	2.554	682	326	438	0	17.073	**22.344**
Near East	92	1.302	2.508	41	459	217	0	4.105	**8.725**
Oceania	190	5.360	3.169	96	204	2.192	0	5.338	**16.548**
ROW	0	0	0	0	0	0	0	0	**0**
USA&Canada	1.865	23.086	36.473	5.060	5.236	3.957	0	26.784	**102.461**
Total general	**6.310**	**133.605**	**223.779**	**9.368**	**31.749**	**27.218**	**0**	**141.007**	**573.035**

Source: Own elaboration

Next, in table 2, we can see the distribution of the value added generated globally through the tourist demand analysed in table 1. The total values by rows should match in both tables. Thus, by reading the first row of table 2, we know that the tourist demand of African origin distributed as shown in the first row of table 1 generates a total value added in economic sectors globally of 2187, mainly in USA&Canada (603) and Asia (537). We can see that in Africa, the value added (48) is higher than the demand (14), which means that value added is being generated in Africa to satisfy the tourist demand from Africa in other regions of the world.

Table 2: Value added 2015 (millions USD)

	Africa	**Asia**	**Europe**	**Latin America**	**Near East**	**Oceania**	**ROW**	**USA&Canada**	**Total general**
Africa	48	537	521	46	330	100	2	603	**2.187**
Asia	3.687	70.620	29.652	3.507	4.786	14.274	122	43.822	**170.469**
Europe	6.355	50.552	134.976	5.893	16.274	3.974	228	32.048	**250.300**
Latin America	356	2.922	2.770	709	335	389	11	14.851	**22.344**
Near East	193	1.892	2.352	141	364	206	7	3.571	**8.725**
Oceania	424	5.654	3.413	349	319	1.739	17	4.632	**16.548**
ROW	0	0	0	0	0	0	0	0	**0**
USA&Canada	2.662	29.390	34.419	5.229	4.719	3.649	73	22.320	**102.461**
Total general	**13.724**	**161.567**	**208.104**	**15.874**	**27.126**	**24.331**	**460**	**121.848**	**573.035**

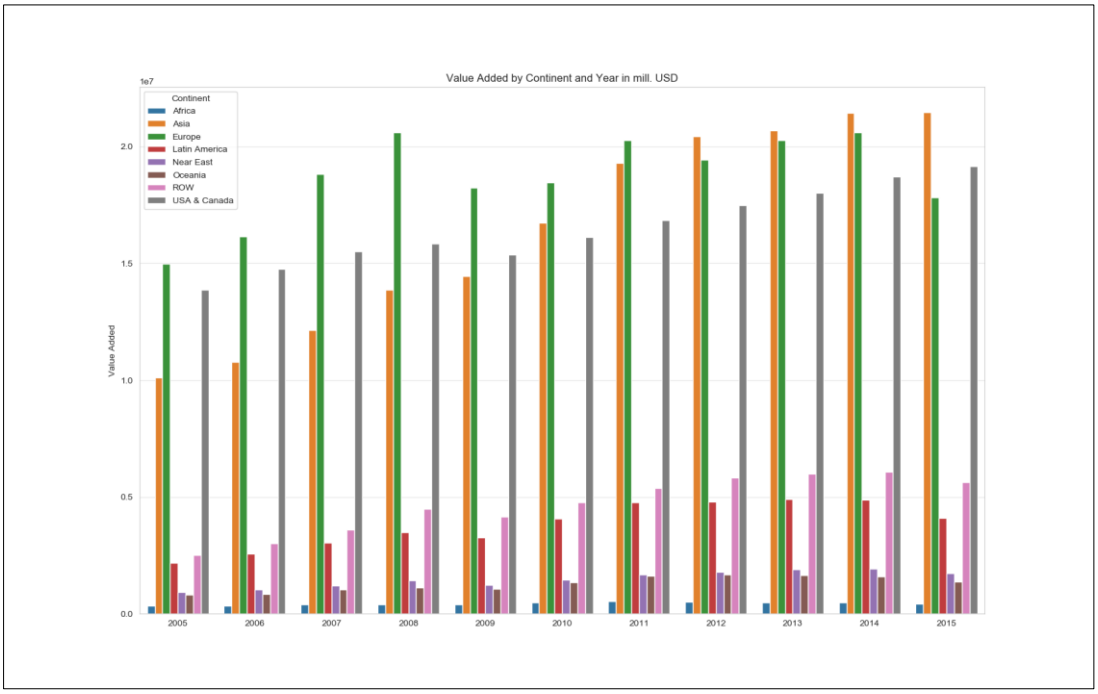
Source: Own elaboration

The highest figure of value added is generated in Europe (134976) due to European tourist demand. Next, we have the value added generated in Asia (70620) by Asian demand, and in third place, we find the value added generated in Asia (50552) by European demand.

The contribution of this article is to extend the analysis for the entire period 2005-2015, every year, which will allow us to analyse the evolution of the weight of tourism internationally, the impact of the crisis on tourist flows and the intra and inter-country cross-sectoral tourism relations. The analysis possibilities offered by the Inter Country Input Output Tables (ICIO) from the OECD are very wide.

Figure 4 analyses the total value added generated in each continent from 2005 to 2015. The great depression, which began in 2008, did not affect all continents in the same way. The Asian continent did not feel the effects of the crisis. In Europe, you can clearly see the effect of the crisis from 2008 and the moderation of growth from that moment. You can also see a new drop in gross value added from 2015.

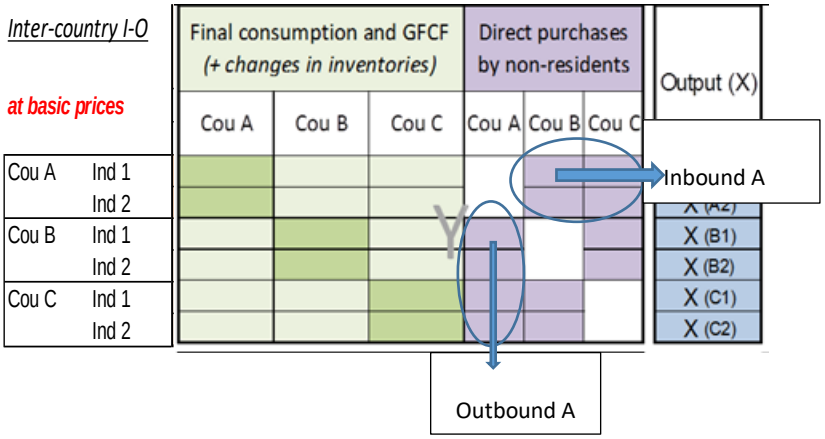
Figure 4: Value Added by continent and year.



Source: Own elaboration

Thanks to the effort made by the OECD to introduce direct purchases abroad by product we can analyse the balance between the inbound and outbound tourism expenditure by continents as you can see in figure 5. In the column of country a (Cou A), we can read the tourism expenditure in Cou B and Cou C, so we have the outbound expenditure. In the country A row, we can see the demand that Cou B and C make in A, so we have the inbound tourism expenditure. The results are shown in figures 6.

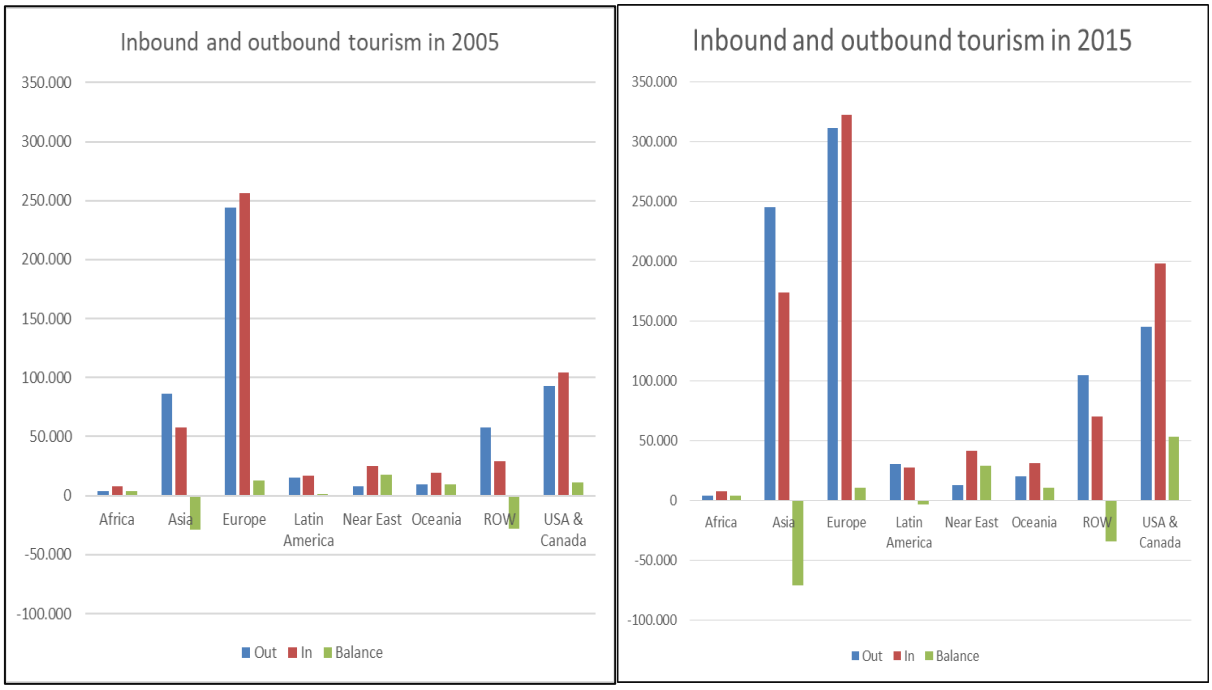
Figure 5: Inbound and Outbound tourism



Source: Own elaboration

In figure 6, it can be proved Asia is the great emerging tourist power. The change between 2005 and 2015 has been important. The inbound and outbound tourism expenditure have increased significantly in Asia. However, Europe maintains its first position. But if Asia evolves with the same force it will reach the first position shortly. USA&Canada have also experienced a significant increase in their inbound and outbound tourism and they have the biggest positive balance. In contrast we find Asia with the biggest negative balance.

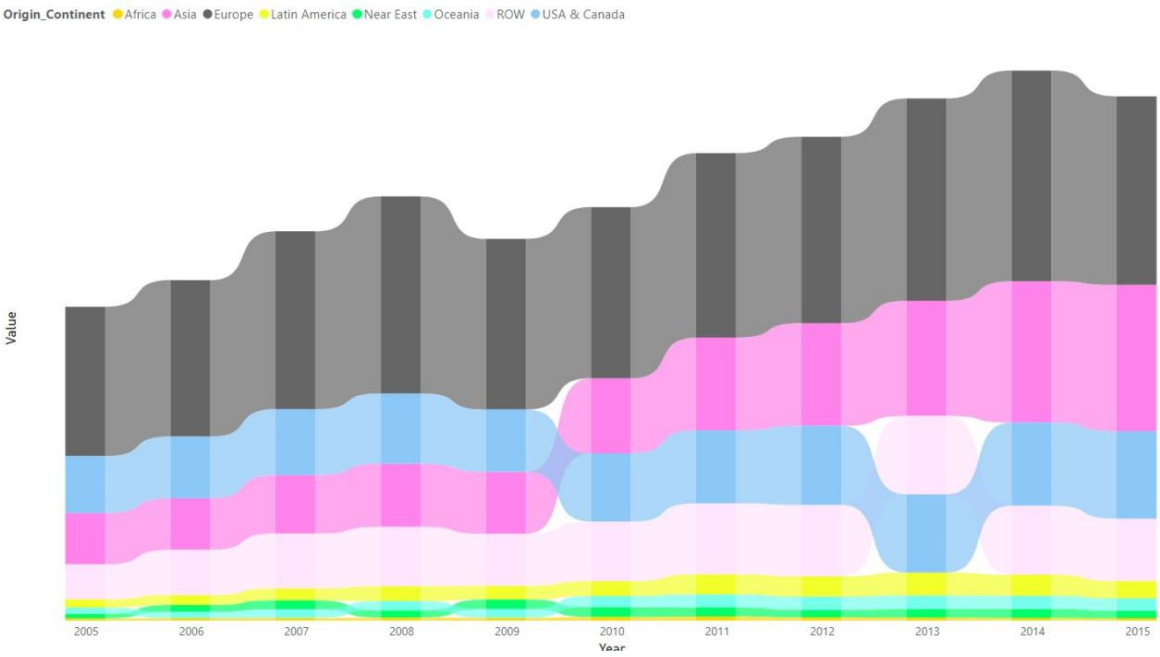
Figure 6: Inbound and Outbound tourism in 2005 and 2015



Source: Own elaboration

The evolution from 2005 to 2015 of direct purchases abroad can be analysed in Figure 7 year by year. At the beginning of the period Asia occupied the third position as a continent in direct purchases abroad after Europe and the group of USA&Canada. Since 2010, Asia has taken second place after Europe. In 2013, USA&Canada fell to fourth position after the rest of the world (ROW), and later returned to occupy third after Europe and Asia.

Figure 7: Direct purchases abroad 2005 –2015

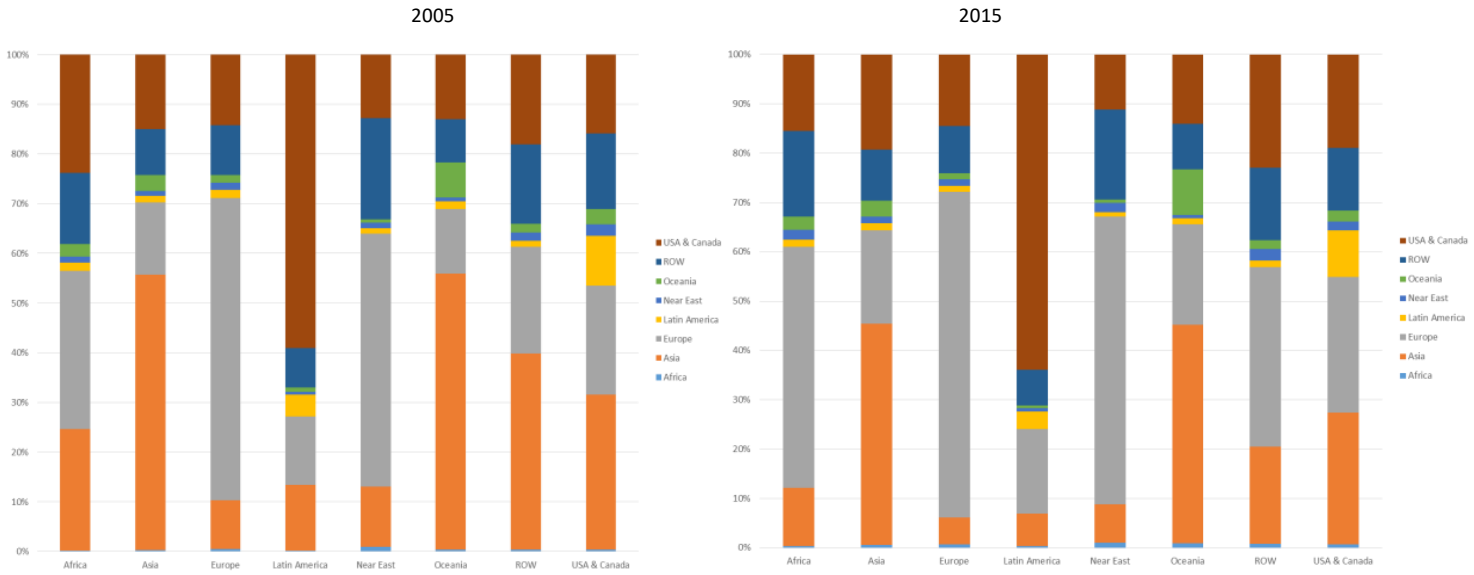


Source: Own elaboration

In figure 8 we can analyse how the added value has been distributed worldwide as a result of the tourist demand received by each continent. Each country receives a tourist demand, but to satisfy that demand, not only produces the country itself that receives the demand since this country must import products from other countries to produce. So finally, the value added necessary to satisfy the tourism demand that a country receives is distributed throughout many countries. The most inbred continent is Europe since most of the value added that is generated to satisfy the tourist demand that Europe receives stays in Europe.

In figure 8, you can also analyse how the African continent between 2005 and 2015 has decreased relations with Europe and increased relations with Asia. The value added generated in Europe due to tourism expenditure in Africa has decreased, while it has increased in Asia.

Figure 8: VA generated by Tourism demand 2005-2015



Source: Own elaboration

Conclusions

The ICIO 2018 offers great opportunities to analyse the composition of tourism and its impact worldwide.

Our starting-point is an *OECD Tourism Paper* (OECD, 2019) that, through the ICIO database, calculates the value added created by tourism expenditure by country of origin for all the countries included in the database in a specific year. Our article expands the study for the entire period year to year not only for inbound, but also for outbound.

We expect to undertake a more complete analysis in the near future: incorporating domestic tourism activities, the analysis of trade flows involved in tourism activities and incorporating the calculation of GHG emissions derived from tourism.

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Appendix 1 Countries

OECD, Inter-Country Input-Output (ICIO) Tables, 2018 edition

	OECD countries		Non-OECD economies
AUS	Australia	ARG	Argentina
AUT	Austria	BRA	Brazil
BEL	Belgium	BRN	Brunei Darussalam
CAN	Canada	BGR	Bulgaria
CHL	Chile	KHM	Cambodia
CZE	Czech Republic	CHN	China (People's Republic of)
DNK	Denmark	COL	Colombia
EST	Estonia	CRI	Costa Rica
FIN	Finland	HRV	Croatia
FRA	France	CYP	Cyprus [2]
DEU	Germany	IND	India
GRC	Greece	IDN	Indonesia
HUN	Hungary	HKG	Hong Kong, China
ISL	Iceland	KAZ	Kazakhstan
IRL	Ireland	MYS	Malaysia
ISR	Israel [1]	MLT	Malta
ITA	Italy	MAR	Morocco
JPN	Japan	PER	Peru
KOR	Korea	PHL	Philippines
LVA	Latvia	ROU	Romania
LTU	Lithuania	RUS	Russian Federation
LUX	Luxembourg	SAU	Saudi Arabia
MEX	Mexico	SGP	Singapore
NLD	Netherlands	ZAF	South Africa
NZL	New Zealand	TWN	Chinese Taipei
NOR	Norway	THA	Thailand
POL	Poland	TUN	Tunisia
PRT	Portugal	VNM	Viet Nam
SVK	Slovak Republic	ROW	Rest of the World
SVN	Slovenia	CN1	China - Activities excluding export processing
ESP	Spain	CN2	China - Export processing activities
SWE	Sweden		
CHE	Switzerland		
TUR	Turkey		
GBR	United Kingdom		
USA	United States		
MX1	Mexico - Activities excluding Global Manufacturing		
MX2	Mexico - Global Manufacturing activities		

Note: Data are presented for 64 countries (i.e. 36 OECD countries and 28 non-OECD economies), the Rest of the World and split tables for China and Mexico.
In the data files, country x industry = NA means the information is not available for the observed combinaison.
For "intermediates", "value added" and "output", data for Mexico and China are split into MX1,MX2 and CN1,CN2, respectively.

Notes:

1. The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities or third party. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in

2. ***Footnote by Turkey:*** The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognizes the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue". ***Footnote by all the European Union Member States of the OECD***

Appendix 2 Industries

Industry_Code	Industry
D01T03	Agriculture, forestry and fishing
D05T06	Mining and extraction of energy producing products
D07T08	Mining and quarrying of non-energy producing products
D09	Mining support service activities
D10T12	Food products, beverages and tobacco
D13T15	Textiles, wearing apparel, leather and related products
D16	Wood and products of wood and cork
D17T18	Paper products and printing
D19	Coke and refined petroleum products
D20T21	Chemicals and pharmaceutical products
D22	Rubber and plastic products
D23	Other non-metallic mineral products
D24	Basic metals
D25	Fabricated metal products
D26	Computer, electronic and optical products
D27	Electrical equipment
D28	Machinery and equipment, nec
D29	Motor vehicles, trailers and semi-trailers
D30	Other transport equipment
D31T33	Other manufacturing; repair and installation of machinery and equipment
D35T39	Electricity, gas, water supply, sewerage, waste and remediation services
D41T43	Construction
D45T47	Wholesale and retail trade; repair of motor vehicles
D49T53	Transportation and storage
D55T56	Accomodation and food services
D58T60	Publishing, audiovisual and broadcasting activities
D61	Telecommunications
D62T63	IT and other information services
D64T66	Financial and insurance activities
D68	Real estate activities
D69T82	Other business sector services
D84	Public admin. and defence; compulsory social security
D85	Education
D86T88	Human health and social work
D90T96	Arts, entertainment, recreation and other service activities
D97T98	Private households with employed persons