OECD publishing

Please cite this paper as:

OECD (2019-05-03), "Providing new OECD evidence on tourism trade in value added", *OECD Tourism Papers*, 2019/01, OECD Publishing, Paris.
http://dx.doi.org/10.1787/d6072d28-en

OECD Tourism Papers 2019/01

Providing new OECD evidence on tourism trade in value added

OECD

OECD Tourism Papers

Providing New OECD Evidence on Tourism Trade in Value Added

Final report

OECD

This document was approved and declassified by the Tourism Committee by written procedure on 19 January 2019 [CFE/TOU/STAT(2017)1/FINAL] and prepared for publication by the OECD Secretariat. The publication of this document has been authorised by Lamia Kamal-Chaoui, Director, Centre for Entrepreneurship, SMEs, Regions and Cities.

This document, as well as any statistical data and map included herein, are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

The opinions expressed and the arguments employed herein do not necessarily reflect the official views of OECD member countries. Comments on Policy Papers are welcomed, and may be sent to The Centre for Entrepreneurship, SMEs, Regions and Cities, OECD, 2 rue André-Pascal, 75775 Paris Cedex 16, France.

© OECD 2019 You can copy, download or print OECD content for your own use, and you can include excerpts from OECD publications, databases and multimedia products in your own documents, presentations, blogs, websites and teaching materials, provided that suitable acknowledgment of OECD as source and copyright owner is given. All requests for commercial use and translation rights should be submitted to rights@oecd.org.

ABOUT THE OECD

The OECD is a multi-disciplinary inter-governmental organisation of 36 member countries which engages in its work an increasing number of non-members from all regions of the world. The Organisation's core mission today is to help governments work together towards a stronger, cleaner, fairer global economy. Through its network of 250 specialised committees and working groups, the OECD provides a setting where governments compare policy experiences, seek answers to common problems, identify good practice, and co-ordinate domestic and international policies.

The OECD member countries are: Australia, Austria, Belgium, Canada, Chile, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The European Commission takes part in the work of the OECD.

ABOUT THE TOURISM COMMITTEE

This policy paper was prepared by the OECD Centre for Entrepreneurship, SMEs, Regions and Cities (CFE), as part of the Tourism Committee's Programme of Work. The Tourism Committee, created in 1948, acts as the OECD forum for exchange, and for monitoring policies and structural changes affecting the development of domestic and international tourism.

Addressing the major challenges faced by the tourism industry, and maximising tourism's full economic potential, requires an integrated and multi-faceted approach to tourism policy development across many government levels and departments. In this environment, OECD members see considerable benefit in co-operating to address economic, sustainability and employment issues, and to promote tourism policy performance and evaluation, innovation and liberalisation of tourism. A closer co-operation with major emerging economies is also seen as being critical to achieving a strong impact with this work.

The website of the Tourism Committee (www.oecd.org/cfe/tourism/) provides detailed information about the OECD activities on Tourism.

Acknowledgements

This report is prepared by the OECD Centre for Entrepreneurship, SMEs, Regions and Cities (CFE), led by Lamia Kamal-Chaoui, Director. The report is part of the programme of work of the OECD Tourism Committee, and its Working Party on Tourism Statistics.

Jane Stacey, Head of the Tourism Unit, co-ordinated the preparation of the report under the supervision of Alain Dupeyras, Head of the Regional Development and Tourism Division. Laetitia Reille, Statistician, co-ordinated the pilot country analysis and provided statistical input and support. The report was drafted by Jane Stacey and prepared with the co-operation, support and substantive contributions from the Statistics and Data Directorate (Fabienne Fortanier and Guannam Miao) and the Directorate for Science, Technology and Innovation (Colin Webb, Nirohiko Yamano and Ali Alsamawi). Monserrat Fonbonnat provided administrative support.

The report benefitted from significant contributions, feedback and guidance from statisticians, policy makers and experts from both OECD and partner countries. It builds on responses to a country survey and inputs from 29 countries: Australia, Austria, Brazil, Canada, Colombia, Croatia, the Czech Republic, Denmark, Estonia, Finland, Hungary, Iceland, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Malta, Mexico, New Zealand, Peru, Poland, Portugal, Slovenia, Sweden, Switzerland, Turkey and the United Kingdom. Pilot country analysis prepared in co-operation with Canada, Portugal and the United Kingdom is also presented.

This report was informed by discussions at a technical workshop held in June 2018, back-to-back with the 2nd Session of the OECD Working Party on Tourism Statistics. The workshop brought together statisticians and policy makers, along with Eurostat and the World Trade Organization (WTO), for in-depth discussion on the data sources, statistical requirements, process and priority actions needed to strengthen the production of tourism trade in value added estimates. This work was also presented and discussed at the 15th OECD-Eurostat Global Forum on Tourism Statistics on 28-30 November 2018 in Cusco, Peru.

Table of contents

Acknowledgements **4**

Executive Summary **7**

Informing policy through analysis of tourism trade in value added 7
Strengthening the statistical framework to analyse tourism trade in value added 8

Introduction **9**

A framework for measuring tourism trade in value added **10**

What is trade in value added 10
Why measuring tourism trade in value added is important 11
Analysing tourism in the trade in value added framework 12
Benefits and implications for policy makers 13

Developing a 'value chain' of tourism statistics to measure tourism trade in value added **15**

National supply and use tables provide data on tourism expenditures and value added 16
National input-output tables trace the value added flows linked with trade in tourism services 18
Bilateral trade statistics identify the tourism trade links between economies 19
Tourism Satellite Account compiles data on inbound and domestic tourism expenditure 21

Producing tourism value added estimates at national level **24**

Demonstrating the potential of tourism value-added analysis at national level 24
National tourism trade in value added indicators, results and policy relevance 26

Producing tourism trade in value added estimates at international level **34**

Demonstrating the potential of tourism trade in value added at international level 34
International tourism trade in value added indicators, results and policy relevance 36

Toward a roadmap to better measure tourism trade in value added **39**

Developing a future statistical agenda to better analyse tourism trade in value added 39
Challenges and priority actions to strengthen the statistical foundations 40
Areas for attention in the longer term 41
Mobilising political support and resources for the statistical work needed to make progress 44

References **45**

Annex A. List of industries and products in OECD Supply and Use Tables **46**

Annex B. List of 36 industries in OECD Inter-Country Input-Output Table **49**

Annex C. Inter-Country Input-Output Methodological Note **50**

Tables

Table 1. Simple schematic Supply and Use Tables 17
Table 2. Format of OECD harmonised national Input-Output Tables 19
Table 3. Product and industry classification in the Tourism Satellite Account 22
Table 4. Indirect domestic value added from tourism expenditure to total value added 33
Table 5. Simplified Inter-Country Input-Output infrastructure 35

Figures

Figure 1. Value chain of tourism statistics for value added measurement 15
Figure 2. Domestic and imported value added content 27
Figure 3. Non-resident tourism expenditure, billions USD 28
Figure 4. Domestic value added generated by inbound tourism expenditures, billions USD 29
Figure 5. Importance of selected industries in expenditure and value added terms 31
Figure 6. Indirect domestic value added generated 32
Figure 7. Value added generated by non-resident expenditure 37
Figure 8. Upstream effects of tourism expenditures 38
Figure 9 Value added created by tourism expenditures by country of origin 38

Boxes

Box 1. Mathematical notation to calculate value added from tourism expenditure 26

Executive Summary

Despite significant work on tourism economics, notably with the Tourism Satellite Account, measures that quantify the direct and indirect roles of tourism in global value chains for a wide range of countries and industries are not yet available. Work of the OECD Tourism Committee's Working Party on Tourism Statistics to analyse tourism from a trade in value added perspective seeks to address this, by scoping out the benefits and challenges of analysing tourism from a trade in value added perspective, and exploring the potential to develop a longer term statistical agenda.

Trade in value-added describes a statistical approach which traces the value added by each industry and country in the production chain, and allocates the value added to these source industries and countries. This work represents a first attempt to capitalise on the OECD-WTO Trade in Value Added (TiVA)[1] framework, and the underlying Inter-Country Input-Output (ICIO) infrastructure, for tourism and explore the new evidence such an approach could provide to support tourism policy. It illustrates how analysing tourism from a trade in value added perspective can shed new light on the relationships between the trade, production, and consumption of tourism services, including the benefits that accrue from tourism, and which industries benefit in particular.

The paper aims to develop understanding of how tourism trade contributes to economic growth and competitiveness, and sets out a roadmap for further work to improve the underlying statistical framework and better measure tourism trade in value added. Future work could be undertaken with the support of the Tourism Committee and its Working Party on Tourism Statistics, in co-operation with the OECD Directorates leading the work on TiVA issues and the data infrastructure, notably the Directorate for Science, Technology and Innovation (STI) and the Statistics and Data Directorate (SDD).

Informing policy through analysis of tourism trade in value added

Analysing tourism from a trade in value added perspective can provide new and useful insights to support policy making and action. This approach allows for having a better understanding of the direct and indirect impacts of tourism, tourism expenditures, and the role of upstream industries in supporting a healthy and competitive tourism sector. It also helps highlight the relevance of the Tourism Satellite Account and its range of possible uses. In doing so, it has the potential to create an additional impetus towards reinvigorating TSA efforts, and improving the underlying statistics common to both the TSA and TiVA frameworks.

Trade in value added indicators can help to better understand the true value of tourism in the national economy, including how much of this value 'sticks' in the national economy, the relative importance of tourism in supporting export-led growth compared to other sectors, and the tourism source markets that generate the most value during their visit. The indicators could also provide evidence on the breadth and in depth of linkages between tourism and other sectors, including the upstream linkages with the rest of the economy. It

[1] TiVA is a joint OECD-World Trade Organization Trade initiative which aims to increase understanding of the process of globalisation by providing insights into the value added created by each country in the production of goods and services that are traded and consumed worldwide.

is also possible to do more depth analysis focusing on specific branches of the tourism sector (e.g. accommodation and food service, passenger transport).

In the longer term, as work to improve and extend the TiVA framework progresses and new data becomes available, new possibilities are opening up to develop useful insights on a range of policy questions, including the impact of tourism on jobs and wages, the role of SMEs and large foreign operators in tourism GVCs, and the impact of tourism on sustainability (CO_2 emissions). Making progress on these and other issues will require statistical and policy engagement at national and international level, and prioritisation of the actions needed to advance.

Strengthening the statistical framework to analyse tourism trade in value added

The preparation of tourism trade in value added estimates, at national and international level, relies on national input-output tables derived from national supply and use tables, National account, bilateral trade statistics data, and the Tourism Satellite Account. These underlying data compiled by national statistics offices have widespread recognition and approval, and represent the "value chain" of national statistics supporting analysis of tourism from a value added perspective.

While much of the work to improve the underlying official national statistics sits with national account and trade statisticians, tourism statisticians also have an important role to play, to ensure tourism-relevant issues are addressed. This includes:

- Greater granularity in national supply and use tables, including in particular improvements in the breakdown of non-resident expenditure by product.
- Improvement of the quality and coverage of the Travel item in Trade in Services statistics, including more detailed service category breakdowns, full partner country information and reconciliation of trade asymmetries for travel.
- Improvement of the implementation of the Tourism Satellite Account, with more complete and disaggregated data on expenditures by product.
- Better alignment and timeliness of data sources, consistent with the supply and use tables, national accounts, and bilateral trade flow statistics.

Raising awareness of the opportunities which exist from analysing tourism from a trade in value added perspective will be important, to mobilise the political support, and resources, required to undertake this statistical work. A related issue will be the need to ensure the output concerning tourism trade in value added is communicated in ways that are easily understood and interpreted by policy makers. Here, it may be beneficial to focus on identifying and developing a core set of trade in value added indicators for tourism, supported by clear policy messaging. The indicators should be meaningful for policy makers, easy to communicate, and easy to understand.

Introduction

The activity on *Providing new OECD evidence on tourism trade in value added* is innovative work to scope out the benefits and challenges of analysing tourism from a trade in value added perspective, and the potential to develop a longer term statistical agenda.

This work highlights the linkages and synergies between tourism statistics, including the Tourism Satellite Account, and the statistical framework underpinning the analysis of trade in value added, and the new data, analysis and evidence such an approach could provide to enable analysis of the upstream effects of tourism and support tourism policy. A main driver to analyse tourism from a trade in value added perspective is the need to better understand the impact of economic globalisation, and its potential for capturing the true economic value, employment benefits and environmental consequences of tourism in national economies.

The work identifies improvements to the underlying official national statistics required to strengthen the statistical framework, and aims to set out a roadmap toward the production of tourism trade in value added estimates and other metrics related to global value chains (GVCs). Where possible, estimates are developed for OECD countries. Beyond the scope of this initial work, the discussion may help also with the development of a longer term statistical agenda to make progress over time.

This work essentially builds on the ongoing OECD Trade in Value Added (TiVA) work, by exploring how to better link tourism data with the underlying Inter-Country Input-Output (ICIO) infrastructure in order to develop new TiVA indicators related to tourism activities. It is undertaken in close co-operation with OECD Directorates leading the work on TiVA issues and the data infrastructure, notably the Directorate for Science, Technology and Innovation (STI) and the Statistics and Data Directorate (SDD).

This paper outlines why measuring tourism trade in value added is important, what linkages can be explored between TiVA and tourism data, what types of results can be expected, and what statistical improvements are needed to better measure tourism from a trade in value added perspective.

A framework for measuring tourism trade in value added

Tourism is one of the main economic sectors benefitting from globalisation. It is a networked industry which links and integrates different branches of the economy, and includes multinationals and a vast majority of small and medium enterprises. Tourism global value chains (GVCs) cover inbound and outbound tourism activities including distribution (travel agencies, tour operators), transportation, accommodation, culture and leisure.

Despite significant work on tourism economics, notably with the Tourism Satellite Account, measures that quantify the direct and indirect roles of tourism in GVCs for a wide range of countries and industries are not yet available. Since tourism expenditures not only generate value added in the country in which the expenditures are made, but may also result in additional imports – including by upstream providers to the tourism industry - analysing tourism trade flows using conventional tourism statistics alone may provide a misleading perspective on the importance of tourism trade to economic growth, employment and income. The aim of the OECD work is to capitalise on the statistical framework underpinning trade in value added analysis and tourism data to build such measures.

Policy makers and statisticians are aware of the necessity of complementing existing statistics with new indicators better tuned to the reality of globalisation. These data will help policy makers in understanding how much and where value added is created by tourism trade – directly and indirectly – the role of tourism services in international trade, and the risks related to GVCs and impact of policy measures. The conclusions from this work may serve as major inputs to high level policy debates (e.g. Tourism Committee, trade discussion, T20, etc.).

What is trade in value added

Trade in value added describes a statistical approach used to estimate the source(s) of value (by country and industry) that is added in producing goods and services for export (and import). It recognises that growing global value chains mean that a country's exports increasingly rely on significant intermediate imports, and, so, value added by industries in upstream countries.

For example a package tour exported by country “A” may require significant inputs, such as transport, food and beverages, and services produced in other countries. In turn these countries may use intermediate inputs imported from other countries to produce the goods and services exported to “A”. The TiVA approach traces the value added by each industry and country in the production chain and allocates the value added to these source industries and countries.

Developed jointly by OECD and World Trade Organization (WTO), the Trade in Value Added (TiVA) initiative aims to increase understanding of the process of globalisation by providing insights into the value added created by each country in the production of goods and services that are traded and consumed worldwide. It addresses the double counting implicit in current gross trade flows, as intermediate goods and services may cross borders many times and do so increasingly with the rise of GVCs.

The growing fragmentation of international production means that analyses using only reported “gross” trade flows gives an incomplete picture of globalisation. The TiVA

initiative measures flows related to the value that is added (labour compensation, other taxes on production and operating surplus, or profits) by a country in the production of any good or service that is exported.

Why measuring tourism trade in value added is important

Analysing how much domestic value added is created by a tourism export is crucial to understand how tourism trade contributes to the economic growth and competitiveness of countries. Some economies have capitalised on global value chains by developing comparative advantages in specific parts of the value chain.

For example, country "A" tourism exports may be dominated by large tour operators with a high level of foreign content, leading to a significant fall in the domestic value added generated by these operators. Other countries' tourism exports may be dominated by the ski, surf or congress sector, or language courses and other educational services. The nature of these exports vary and will provide different levels of value added and jobs for the domestic economies.

Inbound tourism expenditures generally contribute to an economy's value added (e.g. at hotels, restaurants, recreation services, as well as their suppliers). These expenditures may also involve non-domestically produced (imported) value added (e.g. a souvenir produced in another country). Looking at trade in tourism services from a value added perspective will help to illustrate how upstream domestic industries (backward linkages) contribute to tourism exports, even if they have little direct international exposure.

Quantifying the value generated in the tourism value chain makes it possible to identify which type of tourism activities – and tourists - add more value, and help direct policies to encourage businesses to focus more on value rather than volume (OECD, 2017c).

As the relative quality of goods and services produced is an important determinant of profits and value added, relatively lower value added levels with respect to the volumes produced could suggest that tourism in some economies has focused more on volume rather than quality. This is the case, for example, when the focus is on relatively homogeneous and low value tourism services, rather than differentiated and specialised high value added tourism.

Visitors from different source markets also purchase different types of tourism services, which in turn have different impacts. Analysing tourism from a trade in value added perspective allows for a better understanding of these bilateral exchanges, and identification of source markets which generate more value added in the domestic economy.

Overall, analysing tourism from a trade in value added perspective allows for having a better understanding of the direct and indirect impacts of tourism, tourism expenditures, and the role of upstream industries in supporting a healthy and competitive tourism sector (not only accommodation, but financial and legal services as well for example). Understanding upstream contributors and benefiting industries can also help to identify investment needs in the sector.

Measuring tourism trade in value added can particularly help to respond to key policy and statistics questions such as:

- How much value does tourism add to economies?
- Does tourism create additional trade?

- Do tourism services have 'high or low' domestic value added content?
- How does tourism compare to the rest of the economy?
- What is the upstream impact of tourism on other domestic industries?

Analysing tourism in the trade in value added framework

The trade in value added (TiVA) approach relies on input-output analysis, and the construction of inter-country input output (ICIO) tables for the world. The OECD has been working at the interface of input-output analysis and economic policy since the early 1990s. The widespread impact of the financial crisis on international trade led to calls for improved metrics for understanding global value chains. With strong support and advocacy by WTO, OECD's existing input-output activity was expanded, with the development of the first ICIO and OECD-WTO TiVA indicators from 2011.

The first results were released in early 2013, with subsequent versions seeing an expansion in the country coverage, industry detail and number of years covered. Estimates currently produced under the initiative rely on a number of prudent assumptions (proportionality, homogeneity), so that current estimates of the foreign content of exports, and returned value added, are likely to be conservative (biased downwards) (OECD, 2013). The latest sets of TiVA indicators are available on the OECD website (see http://oe.cd/tiva).

Many trade in value added indicators can be derived from national supply and use, and input-output tables, including for example the domestic value added content and import content of exports, i.e. of tourism expenditures in the compiling economy. However, the advantage of international tables (ICIO) is the possibility to obtain insights into the ultimate origin of value added, and the ultimate country of final demand (as opposed to the immediate) partner countries for imports and exports.

Following are examples of indicators that are currently included in the OECD TiVA databases. Indicators with a * can also be derived from national tables:

- Basic measures from the OECD ICIO database: including gross exports and imports, by industry and by intermediate partner country*
- Value added content of gross exports and imports: including domestic and total foreign value added contribution to gross exports by industry, as a percentage of total gross exports*.
- Decomposition of domestic value added in gross exports (by industry)[2]: direct*, indirect* and re-imported value added content of gross exports.
- Final demand measures (origins of value added): including domestic and total foreign value added embodied in final demand*.
- Re-exported intermediate imports.
- Service value added content: domestic* and foreign services value added share in gross exports, percentage.

[2] *Direct* domestic value added in exports refers to the value added generated by the exporting industry itself. *Indirect* domestic value added refers to the value added generated by other domestic (upstream) industries that supply the exporting industry.

- Value added origin by source country and industry: origin of value added in gross exports and in final demand.
- Value added embodied in exports by final destination
- Backward and forward participation in GVCs

Not all these indicators are equally pertinent for the analysis of tourism value added. In particular, the domestic value added generated by tourism expenditures (including which industries), and imported value added (totals, and by immediate and ultimate partner country) will be among the most relevant for tourism policy analysis.

Possible extensions can also be explored for tourism include:

- Work on specific industry branches: accommodation and food service activities, passenger transport etc., where the additional detail in national tables will be particularly helpful.
- In-depth analyses of regional value added created by non-residents expenditure (i.e. country studies). This may include an analysis of the domestic value added created by resident expenditure abroad, for those countries where this may be relevant. For example, how much value added do German tourists generate in Germany by purchasing products or services abroad that include some Germany value added.

As the work to improve and extend the TiVA infrastructure progresses, new data may become available – including with the help of the Working Party for Tourism Statistics - to shed new light on a range of policy questions regarding GVCs, such as:

- The impact of tourism on jobs and wages: using National Accounts estimates on jobs and labour compensation by industry in combination with tourism expenditures and input-output coefficients.
- The role of large (foreign) operators and hotel chains in tourism GVCs: which would require a disaggregation of national supply and use tables by ownership for these industries, along the lines of the methodologies developed by the Committee on Statistics and Statistical Policy (CSSP) Expert Group on Extended Supply and Use Tables.
- The impact of tourism in sustainability: for example analysing CO_2 emissions embodied in the consumption of non-residents (travel exports), using National Accounts-consistent estimates of CO_2 emissions in combination with tourism expenditures and input-output coefficients.

Benefits and implications for policy makers

The input-output analysis driving value added analysis is not new. This approach is well established, and has been widely used to examine the economic impact of tourism (cf Fletcher, 1989). What is new is the development of harmonised input-output tables and creation of the ICIO framework which provides the additional benefit of being able to identify the ultimate source country and industry of imported value added that is sustained by tourism expenditures.

Also, as the data available on tourism increases, this is creating new opportunities to use input-output analysis to deepen knowledge and understanding of the direct and indirect impact of tourism on economies. This work can widen understanding of tourism, and the

inter-connectedness of the sector. It can also provide new insights to inform policy action and support more informed policy making.

For example, such analysis can provide evidence on the role tourism plays within the economy and more particularly the inter-linkages with other sectors. It can identify the sectors which are important in directly and indirectly supporting tourism. The reverse is also true – it can help identify where tourism is supporting and contributing to other sectors of the economy.

This work can also help highlight the relevance of the TSA and bring it closer to policy, which in itself is positive. The TSA provides a foundation for tourism economic indicators. However, over twenty years on since it was originally introduced, implementation of TSA remains a challenge, while its limitations in a globalised economy are also apparent. This work has the potential to create an additional impetus towards reinvigorating TSA efforts, open up a range of possible uses, and improve the underlying statistics common to both frameworks.

Measuring tourism from a trade in value added perspective is conceptually different but complementary to the TSA, which provides data on the direct economic impact of domestic and inbound tourism within the reference economy, measured in value terms. Specifically, TSA measures domestic and inbound tourism expenditure in tourism characteristic and connected industries, in purchaser's prices, and excludes expenditure by cross-border works and travellers in transit.

The analysis of value added measures both the direct and indirect impact of inbound tourism in value added terms – directly through the sale of goods and services to non-residents and indirectly through inputs to these sales – and splits tourism exports into domestic and foreign value added parts. It measures all non-resident expenditures in the reference economy, at basic prices, based on a more detailed product classification.

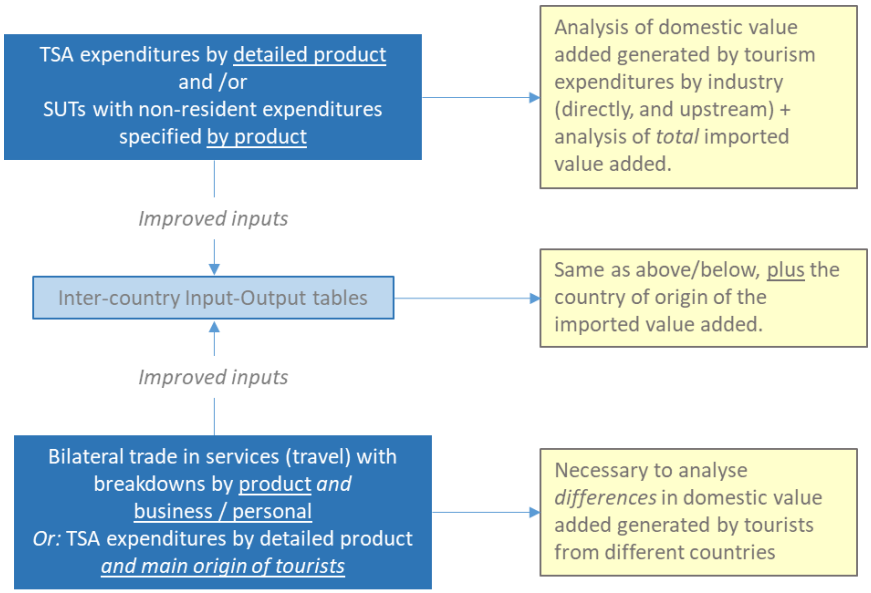
An ongoing challenge constraining TSA efforts is the difficulty in clearly communicating the usefulness and benefits of this tool to decision makers, and what it means for policy and business. This will also be a challenge for value added analysis of tourism. It will be important to clearly show policy makers the benefits of this approach, and how to translate the insights generated into policy action. The policy user perspective is important, to both inform the focus and secure the resources necessary to advance this work.

Developing a 'value chain' of tourism statistics to measure tourism trade in value added

A trade in value added perspective can shed new light on some of the central questions related to the economic and social impact of tourism. Improved tourism statistics (particularly Tourism Satellite Accounts) can in turn support an improved measurement of trade in value added.

The preparation of estimates of the value added from trade in tourism services relies on national input-output tables derived from the supply and use tables, National Account, bilateral trade statistics data and Tourism Satellite Accounts. These underlying official statistics have widespread recognition and approval, and represent the "value chain" of national statistics supporting analysis of tourism from a value added perspective (Figure 1).

Figure 1. Value chain of tourism statistics for value added measurement



Source: OECD Statistics and Data Directorate

While a co-ordinated international approach is required to develop the TiVA framework and construct the ICIO database, national statistical offices have an important role to play as providers of the underlying data for analysis of tourism activities and GVCs – with or without integration into the ICIO.

This national data can frequently also be used directly (i.e. without integration into the ICIO) to analyse for example the direct and indirect domestic value added content generated by non-resident expenditures. This includes identifying the direct and indirect domestic value added generated by purchases of goods and services by non-residents (household consumption).

The ICIO provides the additional benefit of being able to identify the ultimate source country and industry of imported value added that is sustained by non-resident

expenditures. For example, it can identify, for the imported value added generated by tourism, the country and industry in which this value was originally produced.

This section provides an overview of these key building blocks, and the components relevant to the preparation of the ICIO from which the OECD TiVA indicators are derived. The results of a country survey to obtain a better understanding of the available official national statistics in relation to each of these building blocks are also discussed. The survey collected information on the statistical sources available in countries to analyse the value added generated by trade in tourism services, and the challenges and improvements needed to strengthen the statistical framework.

National supply and use tables provide data on tourism expenditures and value added

National supply and use tables (SUT) form the core accounting mechanism underlying the System of National Accounts and the estimation of GDP, with the potential to inform a wide range of policy areas as they provide a birds-eye view of who makes what, how and for whom, and include the components of value added (such as labour compensation).

The tables are used to generate national input-output tables (which are an analytical conversion of supply and use tables), and are essential for the analysis of the value added impact of tourism at the national level, as well as for the construction of the inter-country input-output dataset from which the TiVA estimates are derived. The tables are also essential for constructing the core table of the Tourism Satellite Account, which reconciles domestic supply and internal tourism consumption (TSA Tables 1-6).

Supply tables describe the supply of goods and services, which are either produced by domestic industries or imported. Use tables show where and how goods and services produced in the economy are used either for intermediate consumption or final consumption by households and governments, or exported. Together, they show the production and use of products by industry and product.

Use Tables show the value added generated by productive activities for each industry - that is to say the difference between final output and intermediate consumption. Furthermore, Use tables also show the components of final demand. For the purposes of measuring tourism trade in value added, the relevant component is the *non-resident expenditure* column, which is a sub-category of final consumption.

The OECD Supply and Use Tables database[3] (Table 1) provides information by industry with corresponding breakdowns by product (Annex A). They are available at the total economy level, with separate splits of domestic and import use, at both purchasers and basic prices, and contain complementary tables describing the differences between the two price basis broken down by trade and transport margins and taxes and subsidies on products.

[3] See, for example, https://stats.oecd.org/Index.aspx?DataSetCode=SNA_TABLE30 and https://stats.oecd.org/Index.aspx?DataSetCode=SNA_TABLE40

Table 1. Simple schematic Supply and Use Tables

Supply

Industries / **Products**	Industries			Imports	Trade and transport margins	Taxes less subsidies on products	Total
	Agriculture	Industry	Services activities				
Agricultural products	Output by product and by industry at basic prices			Imports by product	Trade and transport margins by product	Taxes less subsidies on products by product	Total supply by product at purchaser's prices
Industrial products							
Services							
Total	Total output at basic prices by industry			Total imports	Trade and transport margins	Taxes less subsidies on products	Total supply at purchaser's prices

Use

Industries / **Products**	Industries			Final uses			Total
	Agriculture	Industry	Services activities	Final consumption	Gross capital formation	Exports	
Agricultural products	Intermediate consumption by product and by industry			Final uses by product and by category			Total supply by product at purchaser's prices
Industrial products							
Services							
Value added	Value added by component and by industry, at basic prices						Value added
Total	Total output at basic prices by industry			Total final uses by category			

Source: OECD.

Domestic purchases by non-residents broken down by product

A key requirement for analysing the value added generated by inbound tourism in an economy (both at the national or any subsequent analysis at the international level via inter-country tables) is a national supply and use table in which the *domestic purchases by non-residents* are specified not only in terms of the total expenses (as currently the case for most countries), but also by detailed product, as a subcomponent of household consumption expenditure.

While this is part of the OECD Annual Questionnaire on Supply and Use Tables and is supported by the OECD Expert Group on Extended Supply and Use Tables, only a few countries have provided this information to the OECD to date.

From the responses to the country survey, it is clear that the majority of responding countries do not currently prepare the supply and use table with domestic purchases by non-residents disaggregated by product in the Use table. Even where this is the case, this data is only published in a handful of countries, such as Canada and the United Kingdom. Furthermore, most countries have no plans to prepare this breakdown.

Some countries indicated that they do prepare this breakdown, but the data are only available for internal use and are not published for quality and confidentiality reasons. This

is the case in Austria, Portugal and Turkey, for example. Austria reported the aim to improve the quality of the breakdown in the future.

Among the other data sources that could potentially be used to estimate the breakdown of non-resident purchases by product, the two most commonly cited by countries are the surveys of international visitors and credit card transaction data. Other potential sources include data from other Balance of Payments surveys and from tax-free shopping records. A number of countries indicated no other data sources currently exist to develop such estimates, or that it would be difficult and costly to get the data.

One limitation with international visitor surveys is the expenditure data, when available, is collected at a relatively aggregated level. More detailed and extended surveys would be needed to capture a more comprehensive breakdown. Another limitation is such surveys capture budgeted or recollected expenditure, not actual expenditure.

Furthermore, non-resident purchases capture expenditure by all international travellers to the reference economy, not just people travelling for tourism purposes. Only a few countries indicate that these other data sources could potentially also be used to also estimate the breakdown domestic purchases by non-residents ("travel") into tourism and non-tourism expenditure. Developing reliable estimates of this split appears to be more challenging. A further challenge is to incorporate other relevant tourism expenditures that are not captured in the final consumption pillar of the supply and use tables, including business tourism.

National input-output tables trace the value added flows linked with trade in tourism services

National input-output tables (IO) are an analytical conversion of the supply and use tables underlying the System of National Accounts (Table 2), and are designed to measure the inter-relationships between the producers of goods and services (including imports) within an economy, and the users of these same goods and services (including exports).

Input-output tables consist of three blocks: i) intermediate demand, which records monetary flows of intermediate goods and services from one sector to another; ii) final demand, which records consumption of final goods by households as well as the exports, gross fixed capital formation, inventories, and direct purchases (framework maybe not same for all countries); and iii) primary input, where there is data for value added and output.

Harmonised national input-output tables form the basis of the OECD ICIO tables used to estimate trade in value added terms. OECD work to produce these harmonised national input-output tables results in tables which show the flows of final and intermediate goods and services on an *industry x industry* basis (rather than *product x product*). It is compatible with other industry-based datasets, including the bilateral trade in goods by industry dataset; it is also by necessity relatively aggregated.

From a TiVA perspective, the harmonised input-out tables make it possible to determine the domestic value added flows to other economies through exports linked with trade in tourism services. The ideal is for countries to provide the most detailed level of economic activity possible, with a basic price evaluation, and preferably separating domestically produced and imported intermediate goods and services. However, while value added analysis provides important information on the dynamic of input-output within and across economies, data are not usually sufficiently detailed to assess these relationships at sub-sectoral or event product level (OECD, 2017c).

Table 2. Format of OECD harmonised national Input-Output Tables

Symmetric industry-by-industry input output tables, at basic prices

	Intermediate demand			Final expenditure			Output (bp)
	Sector 1	…	Sector 34	Domestic demand	Cross-border exports	Direct purchases	
Sector 1 (domestic)							
Sector 34 (domestic)							
Sector 1 (imports, bp)	Imports of intermediate products					Direct purchases by residents	
…							
Sector 34 (imports, bp)							
Taxes less subsidies on intermediate and final products							
Total intermediate / final expenditure (pu)							
Value added (bp)							
of which, Labour compensation							
of which, other value added							
Output (bp)							

Note: pu: purchasers' prices, bp: basic prices.
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 transport, trade and insurance sectors of foreign and domestic industries.
Source: OECD.

Bilateral trade statistics identify the tourism trade links between economies

Internationally coherent and detailed bilateral trade flow statistics is a further input to the construction of the inter-country input-output table, and for TiVA. Trade flows in intermediate and final goods and services are the glue which tie together the individual input-output matrices derived from national accounts. However, the development of such balanced trade statistics, both for goods and services, is not without its challenges.

For trade in service statistics specifically, including travel, many countries currently lack the level of detail necessary. A further challenge is that available data shows a high level of asymmetry, including in the travel account, and is not always internally consistent with the corresponding flow data in national supply and use tables and their national accounts (OECD and WTO, 2012; OECD, 2013). The reasons for these asymmetries are many and complex, including methodological differences, confidential data and reporting errors.

Trade in services data records the value of services exchanged between residents and non-residents of an economy. This indicator is measured in million USD and percentage of GDP for exports, imports and net trade. All OECD countries compile their data according to the 2008 System of National Accounts. Countries typically collect and publish trade data in national currency. These data are converted into USD (either by the country or by OECD) when submitted to OECD, using an annual average exchange rate. This can lead to asymmetries in reported import and export values between countries. However, as the exchange rate developments are strongly related, the impact on final USD values is likely to be small, and differences in report values are more related to methodological issues.

The OECD and WTO have undertaken work to create a global dataset of coherent bilateral trade in services statistics by main services categories, to serve as an input for the compilation of the TiVA ICIO tables, and as a tool for policy analysis in general (OECD

and WTO, 2017). This requires the production of estimates using econometric model estimates for a large number of bilateral trade observations to complete datasets for bilateral exports and imports by Balance of Payments (EBOPS) category, and the reconciliation of trade asymmetries through a top-down approach to ensure consistency.

Information on the breakdown by partner country typically obtained from Balance of Payments Trade in Services statistics provides a key tool to develop expenditure patterns by tourists from different countries of origin. Such bilateral trade in services information for travel also provides a very useful input for the work by OECD and other international organisations to develop high quality inter-country input-output tables, by providing the means to correctly identify the links between economies.

While detailed bilateral trade in services data by EBOPS category are currently produced by most OECD countries and collected by OECD, more granular bilateral information on the purpose of the trip and the alternative breakdown of travel by product, as recommended in the Manual on Statistics on International Trade in Services (MSITS) 2010 and the International Recommendation on Tourism Statistics (IRTS) 2008, would be helpful.

Expenditure patterns of tourists from different countries of origin

Providing bilateral trade in tourism services statistics broken down by detailed product and country of origin of tourists would be particularly useful in strengthening analysis of the value chain for tourism statistics. This is the second most important element for improved tourism statistics, after developing extended supply and use tables with expenditure breakdowns for non-resident purchases by product. Tourists from different countries have different expenditure patterns, and analysing these from a value added perspective may provide additional insights for policy makers.

The Manual on Statistics for International Trade in Services provides for bilateral trade splits of expenditure by category and by type (business or leisure). Having these data further broken down by country of origin of tourists would be highly beneficial, but is not currently available. In the absence of bilateral trade data broken down by geography, it may be possible to generate country of origin expenditure estimates using international tourism expenditure surveys.

This is an issue that is currently being discussed at the EU Travel Workshop in International Trade and Service Statistics. For most European countries, it should be possible to breakdown expenditure by country of origin and business/leisure; the issue of cross-border workers less clear. However, for breakdown by product, there are limitations, not least in relation to overnight and same-day visitors, as these have different expenditure patterns. Importance of this varies by country, but same-day visitors are a significant part of the visitor economy in some countries.

Majority of countries collect country of residence information in tourism surveys, as well as expenditure data. However, sampling and sample size issues mean that the reliability of this data is frequently weak and it is not of sufficient quality to be published. In some countries, the TSA provides the total expenditure data, and the trade data is used to breakdown by country. The possibility of breaking down expenditure by product is less clear – there appears to be variation across countries, but countries expressed an openness to see how the questions on their tourism surveys may be improved to address this.

A key challenge here is there is no single data source provides country of origin, product and expenditure data. Without this, it is assumed (proportionality assumptions) that everyone has the same expenditure patterns, which is clearly not the case.

Having such data would enable a meaningful analysis of the different impact of visitors from different countries on the value added generated from tourism in the economy in the country of reference. It will also assist in the construction of the ICIO, bringing together the bilateral trade in services statistics with the supply and use tables to improve the link between these two sets of data, and through this improve the ICIO and TiVA analysis. So there is a clear dual purpose where this type of additional information would be much valued. Even having data for visitors from the 2-3 main source markets to a country would be helpful.

A further geographical/bilateral breakdown refers to the breakdown of business travel, which is linked with intermediate consumption in the supply and use tables, and leisure travel, which is linked with final consumption. Business tourism is captured in intermediate exports, and adjustments are needed to incorporate it into value added analysis of tourism.

Almost half of countries responding to the survey report publishing bilateral trade in services statistics for the travel item by purpose of trip (business/personal). Tourism data sources used to provide this breakdown include: survey of international visitors, border arrivals/departure data, accommodation statistics and credit card transaction data, as well as national household and outbound travel surveys. Sample size limitations are a main challenge, while difficulty collecting data from international travellers is also an issue for countries.

In some cases, this data is compiled for the travel item of the Balance of Payments, but not published. For the most part, those countries that do not currently publish bilateral trade in services statistics for travel by purpose of visit have no plans to do so at the moment. Reasons include other priorities, lack of resources and lack of information.

Very few OECD countries currently publish bilateral trade in service statistics for travel with breakdowns by product (i.e. the alternative EBOPS breakdown), and most countries have no plans to develop this data in the near future. Only three countries responding to the survey report doing this (Australia, Italy and Korea). In each of these cases, the tourism data sources are used to breakdown the data include: survey of international visitors (Australia and Italy), and credit card and foreign currency transaction data (Korea).

Tourism Satellite Account compiles data on inbound and domestic tourism expenditure

The Tourism Satellite Account (TSA) is the main internationally recognised standard to measure tourism economic impacts in the national economy, reconciling the demand (visitor consumption) and supply (production by tourism-related industries) sides of tourism. It has been jointly developed by the OECD, UNWTO, Eurostat and United Nations Statistics Division. It provides a consolidated and detailed picture for the complex set of industries related to tourism, based on the harmonisation and reconciliation of tourism statistics, based on a National Accounts perspective.

The national supply and use tables which are essential for the analysis of trade in value added are also vital building blocks for preparing the core tables of the TSA. Table 6 of the TSA – Total domestic supply and internal tourism consumption (at purchases prices) - reconciles internal tourism consumption, which is the consumption of resident (domestic) and non-resident (inbound) visitors within the economy of reference (TSA Table 4), with domestic supply (TSA Table 5). It derives from the supply and use tables, and is based on tourism characteristics and connected products, and other consumption products (Table 3).

In national supply and use tables, it is particularly important to understand what products and services are purchased by non-residents, for the analysis of the value added generated by tourism. These figures are typically only provided at the total level, although work is ongoing in the area of National Accounts statistics to enhance this coverage, supported by the OECD Supply and Use Table questionnaires that explicitly ask for this breakdown to be provided as part of the work of the OECD Expert Group on Extended Supply and Use Tables.

Table 3. Product and industry classification in the Tourism Satellite Account

Tourism characteristic consumption products	Activities (tourism industries)
Accommodation services for visitors	Accommodation for visitors
Food- and beverage-serving services	Food- and beverage-serving activities
Railway passenger transport services	Railway passenger transport
Road passenger transport services	Road passenger transport
Water passenger transport services	Water passenger transport
Air passenger transport services	Air passenger transport
Transport equipment rental services	Transport equipment rental
Travel agencies and other reservation services	Travel agencies and other reservation services activities
Cultural services	Cultural activities
Sports and recreational services	Sports and recreational activities
Country-specific tourism characteristic goods	Retail trade of country-specific tourism characteristic goods
Country-specific tourism characteristic services	Other country-specific tourism characteristic activities

Note: For detailed information on the coverage, please see annexes 2 and 3 of the IRTS 2008.
Source: UNWTO-OECD-Eurostat, TSA-RMF 2008.

Detailed expenditure data by product in the Tourism Satellite Account

In the absence of detailed information in supply and use tables on the expenditures of non-residents by products, more disaggregate information on such breakdowns currently included in the TSA – which by definition should be consistent with the National Accounts – would be a very useful alternative to develop first estimations of the value added created by tourism in countries.

For the majority of countries that compile TSA Table 4 (and its underlying tables), a more detailed breakdown of expenditures by product is not available, beyond the categories provided for in the TSA-RMF 2008. Only a handful of countries report that a more detailed breakdown is available; however in most of cases this is only to a limited extent. A detailed breakdown is available at purchaser's prices but not published for Portugal, for example.

Given the strong relationship between the TSA and supply and use tables, the reason more detailed product breakdowns are not available is the same, namely that the underlying surveys used to gather tourism expenditure data are designed to support the compilation of the TSA. This is the case, for example, in Austria and Finland. Other countries report that it is a struggle to complete all the TSA categories, never mind provide a more detailed breakdown. Only Colombia and Latvia report plans to develop a more detailed breakdown in the future.

Data sources to measure tourism expenditure by product, purpose of visit, country of origin

Like for Travel in the Trade in Services account, the main sources of data used to measure tourism expenditure data in most countries include international visitor and border surveys, for international tourists, and national visitor and household surveys for domestic tourists. Other sources include: the Balance of Payment and Supply and Use Tables, along with accommodation surveys and statistics, administrative data sources including immigration and tax data, and business data sources including credit card data, employment and Structured Business Statistics.

These sources can potentially be used to break down tourism expenditure by:

- Product: possible sources include survey of international and domestic visitors, household survey, credit card data, administrative sources (tax), Balance of Payments, Supply and Use Tables and National Accounts.
- Purpose of visit (business v. personal travel): possible sources are surveys of international and domestic visitors.
- Country of origin of tourists: possible sources include survey of international visitors, accommodation statistics, credit card data and immigration data.

The country survey indicated that credit card transaction data was a data source that could potentially be used to develop a more detailed breakdown of expenditures by product in the TSA. One advantage is the possibility to get data based on country of issue crossed with expenditure breakdown by merchant code category. However, this data source is not without its limitations - such data may only capture part of total expenditure by visitors, while other challenges include accessibility, confidentiality and resources to secure such data.

In Sweden, for example, Balance of Payments data is currently used to breakdown tourism expenditure. This draws on credit card data. However, a new survey of international visitors is planned, which will provide additional data on country of origin.

Producing tourism value added estimates at national level

Analysing tourism from a trade in value added perspective at national level shows how output in the tourism sector uses inputs from other domestic industries and imports (OECD, 2014). This section presents pilot country examples based on a national input and output table derived by OECD from official national supply and use tables. The intention is to use these pilot cases to show what is possible using national statistical inputs. This approach also sheds light on the challenges and issues countries face to develop similar statistics, building on expenditure data from the TSA and other sources.

Demonstrating the potential of tourism value-added analysis at national level

National data can be used to analyse tourism from a trade in value added perspective and derive indicators on the direct and indirect value added generated by non-resident expenditures within the domestic economy. This analysis can be done at the national level, using data available in the national supply and use tables (converted into input-output tables). Where a sufficient level of detail is not available in the supply and use tables, this can be combined with detailed TSA tourism expenditure data where available.

An advantage of this approach is the analysis can be tailored to the national context, allowing for more granular analysis focused on the products and industries relevant for that country. Another advantage is the resulting analysis can be fully consistent with other national statistics. The international approach necessarily involves some level of aggregation to fit with the harmonised approach.

It is currently much easier and more accurate to make country estimates at the national level using all available sources to come up with details of products non-residents spend their money on. National statisticians are closer to the data and better placed to use their expert judgement and knowledge of national data to produce more granular and higher quality estimates. This approach can then feed into the international framework and facilitate tourism analysis in the ICIO framework, to make tourism estimates more accurate.

The analysis has been prepared in co-operation with Statistics Canada, Statistics Portugal/Turismo de Portugal and the Office of National Statistics in the United Kingdom, together with the OECD Statistics and Data Directorate (SDD).

Methodology, assumptions and limitations

Canada was the first country selected for this analysis, as it has the most complete data available for non-resident expenditure (*domestic purchases by non-residents*) in the Supply and Use Tables database collected by the Statistics and Data Directorate. Non-resident expenditure is a sub-category of the final consumption expenditure by households. In the final demand section of the use table, Canada is at present the only country to report such data with a breakdown by product to the OECD as part of the annual collection of supply and use tables. The 2012 supply and use table data for Canada is available in basic prices, and with detailed breakdown across 65 aggregated industry and product categories, as defined by the OECD to harmonise and enhance the comparability of the supply and use tables. A list of the 65 industries included in the OECD extended Supply and Use Table Database is presented in Annex A.

Portugal and the United Kingdom also compile a breakdown of non-resident expenditure in their supply and use tables, but currently only report this data at an aggregate level to the OECD. In the case of the UK, the disaggregated data is published and has been provided by the UK Office of National Statistics. Portugal does not publish this data, but has shared it for the purposes of this exercise, to compare with other pilot cases.

The UK data is available for 2010 at purchaser's prices and disaggregated at a level of 102 products. It has been aggregated and allocated by ONS to fit in the 65 products as prepared for the analysis by the OECD. The Portugal data is provided for 2015 at purchaser's prices. Statistics Portugal, in collaboration with Turismo de Portugal aggregated and allocated the data to align with the 65 products categories collected by the OECD.

In both cases, data have been converted into basic prices using the ratios of the final consumption expenditure by household data which is available in both purchasers and basic prices for each product. As analysis of expenditure and value added is at basic prices, this adjusts for differences in taxation rates (e.g. taxes paid by non-resident expenditures for hotel and restaurants) and allows for better comparison between countries. This is also the approach used in the inter-country tables, which are similarly at basic prices.

The availability of the non-resident expenditure data by product makes it possible to analyse the value added generated from these 'exports' in the reference country. However, non-resident expenditure in the supply and use tables do not fully align with inbound tourism expenditure in the Tourism Satellite Account.

On the one hand, non-resident expenditure captures the expenditures of all non-residents in the reference country, including cross-border workers and passengers in transit, which are excluded from the TSA (in align with the International Recommendations on Tourism Statistics 2008). On the other hand, the TSA considers other relevant tourism exports which are not captured in the concept of non-resident expenditure in the supply and use tables, including business tourism expenditure and international passenger transport. In this sense, the TSA has a wider range.

As non-resident expenditure is a component of final household demand in the supply and use tables, business tourism expenditures are not covered, even while these make a significant economic contribution. Non-resident business tourism expenditures are considered as exports - these are captured in the intermediate consumption part of the supply and use table of foreign economies (resident business tourism expenditures are allocated to intermediate consumption of the economy of reference).

As such, business tourism expenditures are not part of the conventional TiVA or ICIO framework. Addressing this is an adaption which needs to be made for tourism. Detailed information would be needed from other sources to incorporate travel for business purposes into the value added estimates for tourism. Data from the TSA or tourism expenditure surveys could potentially be used to develop these estimates.

The supply and use table is then converted to an input-output table, from which a Leontief inverse multiplier was derived and used to estimate the direct and upstream impacts of final demand expenditure on tourism services. From this analysis, it is possible to identify the direct and indirect (in upstream industries) value added generated by non-resident expenditure on tourism-related goods and services in the reference country (domestic), and in other countries (foreign/imported) (Box 1).

For those countries that only provide a *total* non-resident expenditure figure in the supply and use tables, but no breakdown by product, Tourism Satellite Account data can be used

to provide disaggregated estimates. The inbound tourism expenditure column in TSA Table 4 is linked with the non-resident expenditure column of the supply and use table.

However, the TSA does not provide the level of product detail available in the supply and use tables, and in the case of most countries, the level and detail of expenditure information in the TSA expenditure tables is not currently sufficiently detailed to prepare such estimates. That said, it should be possible to make the same product classification detail available in the TSA, building on the national accounts aggregates.

Box 1. Mathematical notation to calculate value added from tourism expenditure

Supply and use tables can be analytically transformed into a national input-output table using the Fixed product sales structure assumption to attribute secondary production, i.e. 'Model D' in the Eurostat Manual on Supply, Use and Input-Output Tables, which is the recommended approach to generate *industry x industry* input-output tables and avoids negatives. This in turn permits the application of the Leontief inverse multiplier to calculate the upstream linkages:

v x ***B*** x ***Tourism expenditure***

- Where ***v*** is value added over output ratio (by industry)
- ***B*** is Leontief inverse matrix
- ***Tourism expenditure***, including domestic and inbound tourism expenditure (using basic price and including tourism in transit, extrapolated) (by industry)

Information on domestic tourism expenditures would provide additional insights on the value added generated by tourism. The potential exists to use TSA data to identify expenditures made by residents on tourism, as this category is not separately identified in household consumption in the supply and use tables. This approach was tested on the Canada data (taking the relative share and breakdown of domestic and inbound tourism expenditure) in an attempt to estimate the value added generated from tourism through resident expenditures (as a proxy for domestic tourism).

First results were unsatisfactory and likely to be over-estimated as it was not possible to isolate the expenditure by domestic tourists from wider resident expenditure on tourism-related goods and services. It would also need to be assumed that resident expenditure was structured similarly to non-resident expenditures, within the main expenditure categories. On this basis, countries agreed at the 2nd Working Party on Tourism Statistics to focus in the first instance on expenditure of non-residents.

National tourism trade in value added indicators, results and policy relevance

From this analysis, the following indicators have been generated:

Domestic value added generated from non-resident expenditure

Non-resident expenditures generate value added in the reference economy. In both Canada and the United Kingdom, non-resident expenditure is responsible for 2.2% of the domestic value added generated by household consumption expenditure. This is in line with non-resident expenditure as a share of household final consumption in Canada (2.3%) and in the United Kingdom (2.1%) (when measured in gross value rather than value added terms).

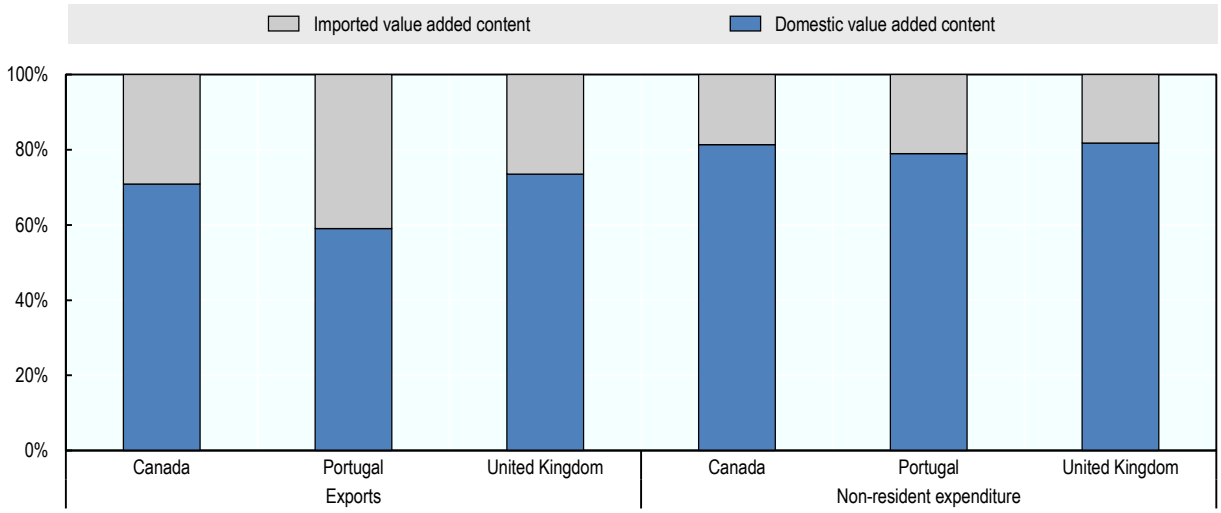
In Portugal, this share is considerably higher, with non-resident expenditure responsible for 7.5% of domestic value added generated by household consumption expenditure. This highlights the importance of tourism to the Portuguese economy, and is similarly in line with non-resident expenditure as a share of household final consumption (7.6%).

Domestic and imported value added content of selected final demand categories

The domestic value added content of non-resident expenditure – exports – in the three countries is higher, compared with overall exports (Figure 2). This points to the positive impact tourism exports have on the domestic economy, compared with other sectors of the economy, and is explained by the types of products and services that non-residents are more likely to purchase, compared with households in the reference economy.

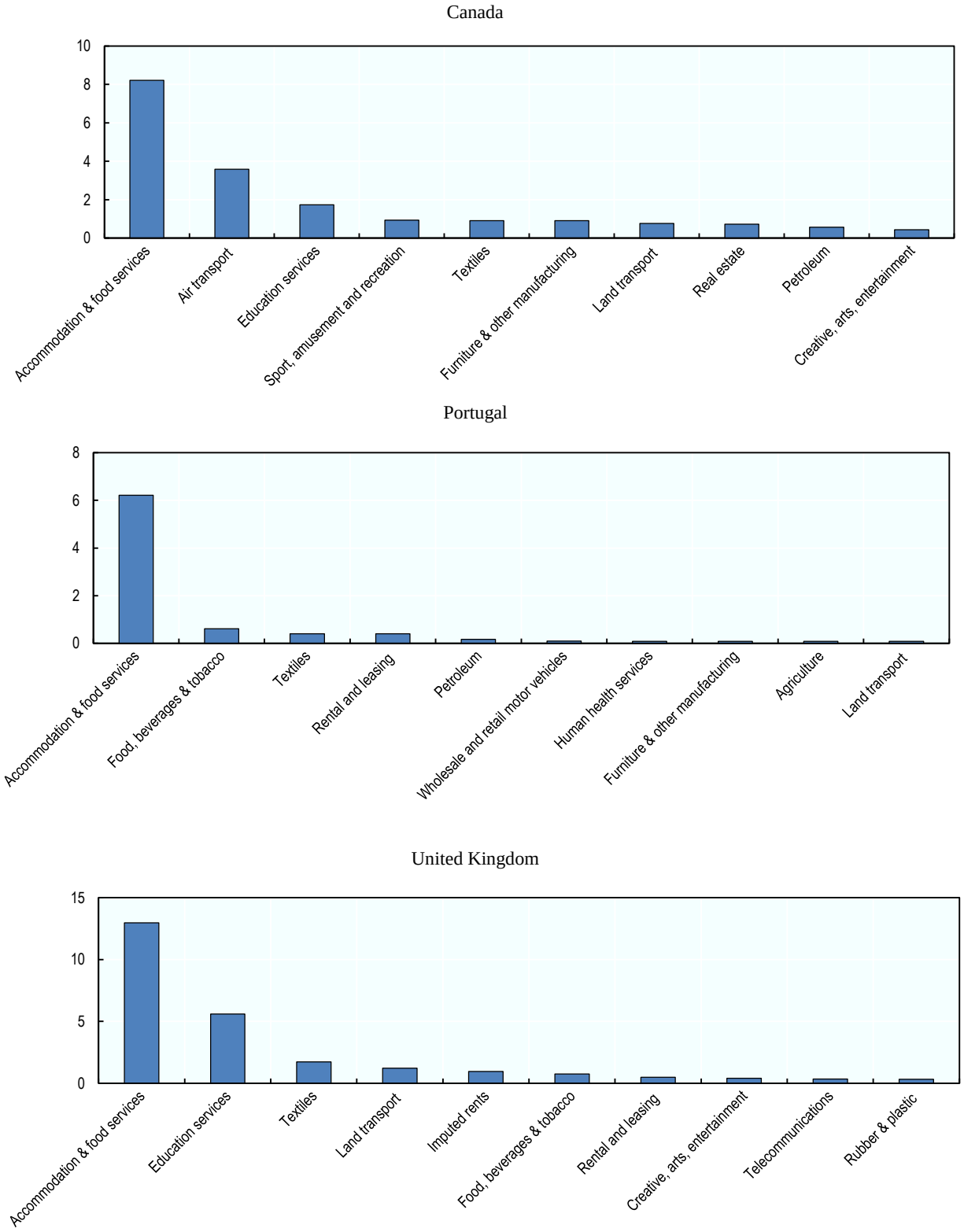
This difference is particularly marked for Portugal, where 1 euro of non-resident expenditures generates 79 cents of value added, compared with 1 euro of overall exports which generate 59 cents of value added. In Canada, whereas 1 CAD of exports generates 71 cents of Canadian value added, 1 CAD of non-resident expenditure generates 81 cents of Canadian value added. Similarly in the United Kingdom, 1 GBP of exports generates 74 pence of value added, while 1 GBP of non-resident expenditures generates 82 pence of value added.

Figure 2. Domestic and imported value added content



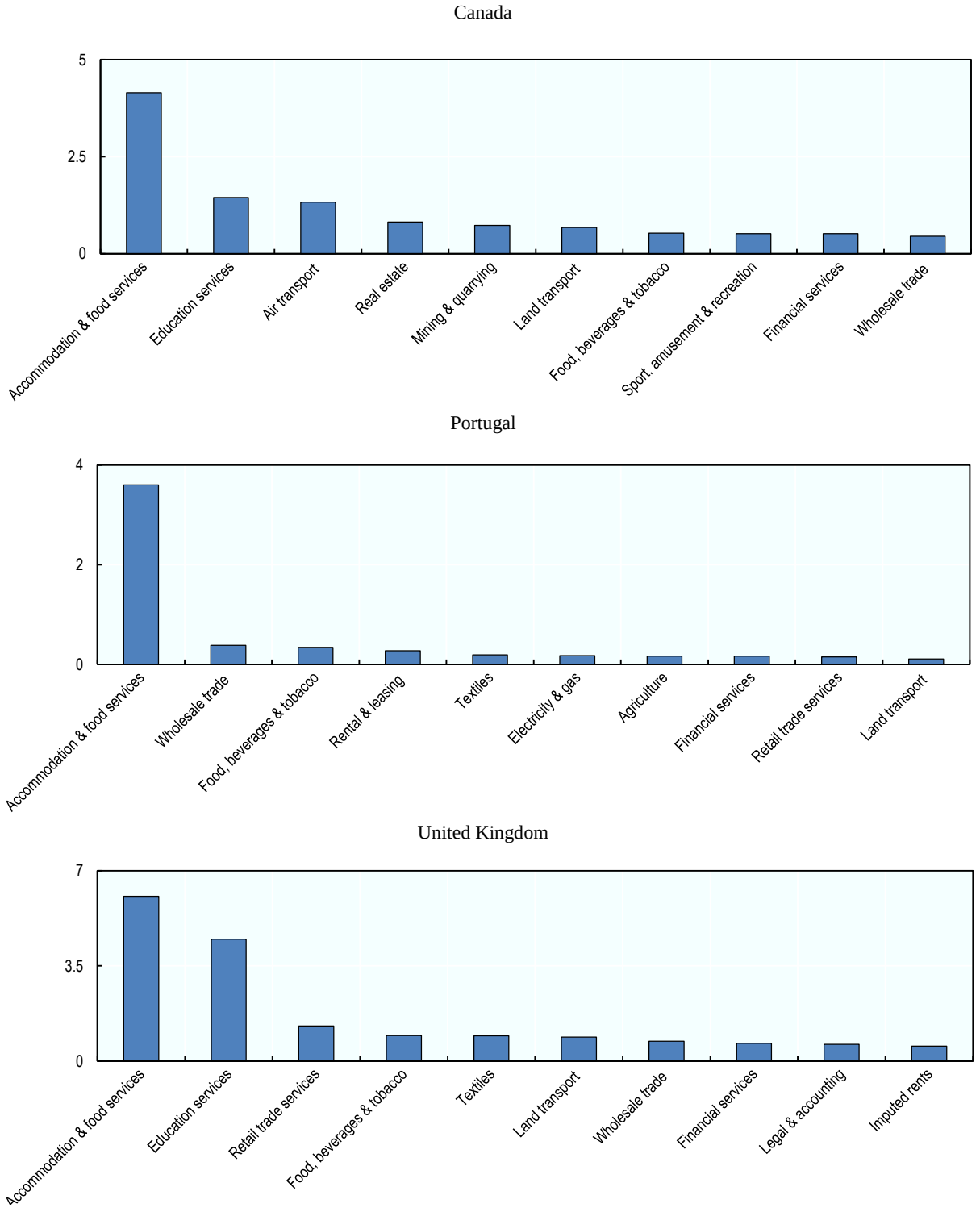
Source: OECD Centre for Entrepreneurship, SMEs, Regions and Cities/OECD Statistics and Data Directorate calculations based on Canada (2012), Portugal (2015) and United Kingdom (2010) Supply and Use Tables.

Figure 3. Non-resident tourism expenditure, billions USD



Source: OECD Centre for Entrepreneurship, SMEs, Regions and Cities/OECD Statistics and Data Directorate calculations based on Canada (2012), Portugal (2015) and United Kingdom (2010) Supply and Use Tables.

Figure 4. Domestic value added generated by inbound tourism expenditures, billions USD



Source: OECD Centre for Entrepreneurship, SMEs, Regions and Cities/OECD Statistics and Data Directorate calculations based on Canada (2012), Portugal (2015) and United Kingdom (2010) Supply and Use Tables.

Non-resident tourism expenditure patterns measured in gross and value added terms

Tourism export patterns vary across countries, reflecting the types of products and services non-residents purchase in different countries. These patterns also vary depending on whether measured in value (Figure 3) or value added (Figure 4) terms.

As might be expected, the biggest expenditure item for non-residents is accommodation and food services in Canada (40% of non-resident expenditure), Portugal (70%) and the United Kingdom (46%), when measured in gross value terms. In the case of Portugal, the high share of accommodation and food services is particularly high. Non-residents are responsible for 42% of total household final consumption expenditure on accommodation and food services in Portugal.

Beyond this, the pattern is somewhat different. Together with education services (20%), these two industries account for two thirds of non-resident expenditures in the UK, while in Canada air transport (17%) is the second biggest expenditure item, ahead of educational services (8%).

Somewhat surprising for an island destination like the UK is the absence of air in the top industries capturing non-resident expenditures. It is unclear why this is the case, but it may be reflective of a combination of the relative size of the country (leading to less use of air transport within the country), or to a relative lower cost of airfares and proximate source markets.

However, when examining the domestic value added generated by non-resident expenditures, a different pattern emerges (Figure 4).

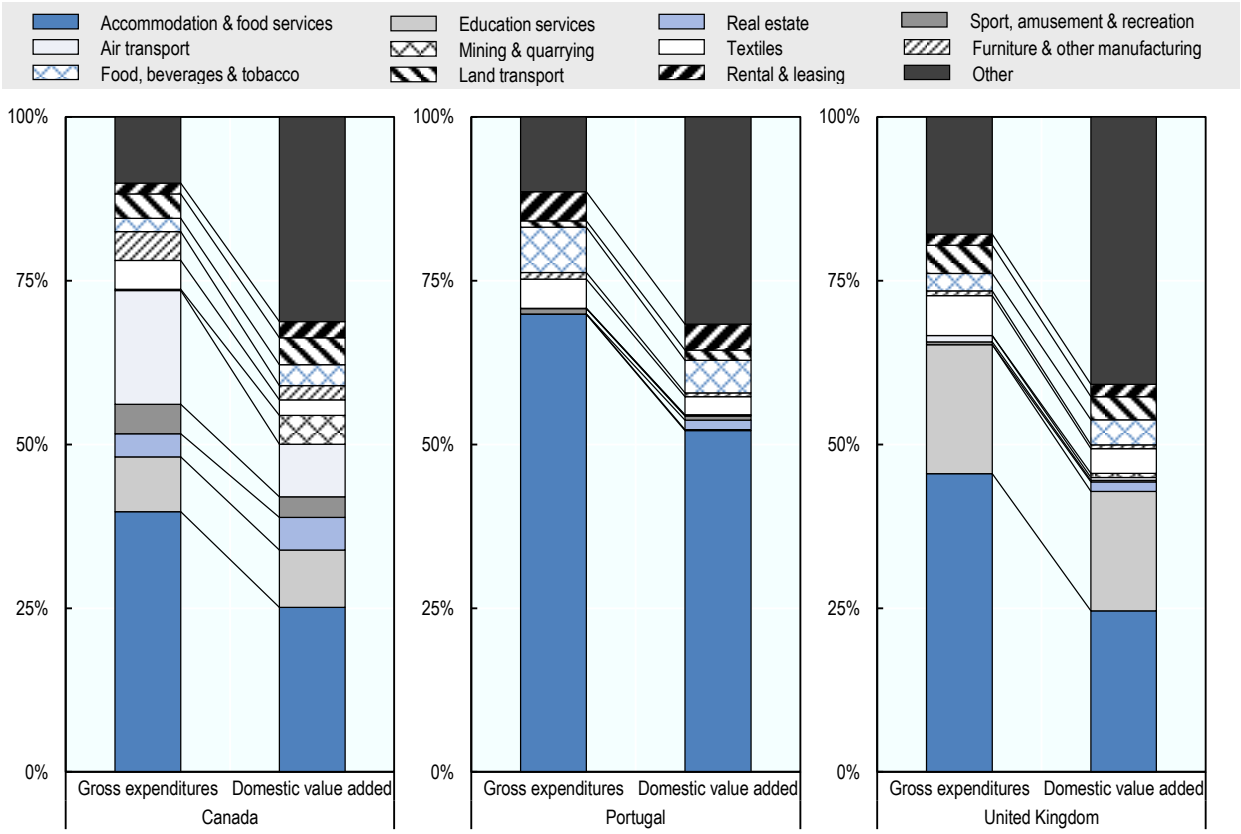
Importance of selected industries in non-resident tourism expenditures

Comparing the relative role of industries in gross and in value added terms, Figure 5 combines Figure 3 and Figure 4 for selected industries. It illustrates the changes in relative importance of certain industries when analysing the value added embodied in non-resident expenditures, as compared to expenditures as such.

Whereas nearly 40% of non-resident expenditures are spent on accommodation and food services in Canada, this share is only 27% in value added terms. A similar pattern is found in the Portugal and the UK. In Portugal, where these expenditures account for 70% of gross expenditures, this share falls to just over 50%, while the UK these expenditures account for 46% of total non-resident expenditures in gross value terms, falling to 25% when measured in value added terms.

Instead, other industries become more important – pointing to their upstream role providing inputs to the products and services that tourists buy. These include education and real estate in Canada, wholesale trade and electricity and gas in Portugal, and food, beverage and tobacco and financial services in the United Kingdom.

Figure 5. Importance of selected industries in expenditure and value added terms



Source: OECD Centre for Entrepreneurship, SMEs, Regions and Cities/OECD Statistics and Data Directorate calculations based on Canada (2012), Portugal (2015) and United Kingdom (2010) Supply and Use Tables.

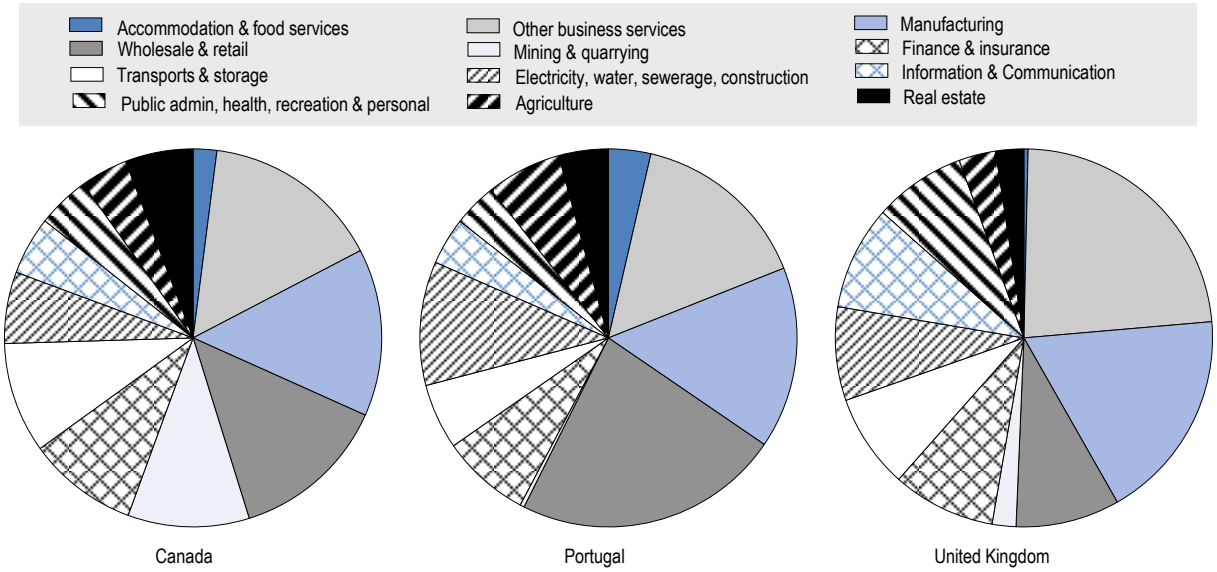
Indirect domestic value added generated by non-resident tourism expenditures

Analysing the domestic value added generated by non-resident expenditures means that not only the value added generated by those industries catering to tourists is considered, but also all the upstream contributions of other industries (Figure 6).

Overall, each CAD of direct value added generated by non-residents tourism expenditure generates an additional 70 cents of upstream value added. In Portugal, for each euro of direct value added generated by non-resident tourism expenditure, an additional 54 cents of value added is generated in upstream industries. In the United Kingdom, each GBP of direct value added generated by non-resident tourism expenditure generates an additional 48 pence of upstream value added.

The charts examine what industries are involved in such upstream contributions, and in each case illustrate in particular the importance of services for the functioning of tourism, including other business services, wholesale and retail, finance and insurance.

Figure 6. Indirect domestic value added generated



Source: OECD Centre for Entrepreneurship, SMEs, Regions and Cities/OECD Statistics and Data Directorate calculations based on Canada (2012), Portugal (2015) and United Kingdom (2010) Supply and Use Tables.

Ratio of indirect domestic value added to total value added

As already indicated above, many industries do not cater directly to non-residents, but because their outputs are used by those industries that do, production in such upstream industries is also dependent on non-resident expenditures. Table 4 gives a few examples of such industries, and identifies the importance of tourism in their total value added.

For example, the fishing industry in Canada does not sell directly to non-resident tourists – but does cater to them indirectly by supplying restaurants or supermarkets. Indirectly, 1.6% of total production in this industry is dependent on inbound tourism. Similarly, in Portugal, 5% of total production in the agricultural industry is (indirectly) dependent on international tourism.

Likewise, non-residents do not typically purchase advertising services in the United Kingdom – but the hotel they are staying most certainly does. In sum, 1.1% of production in the advertising and market research industry is dependent on non-resident tourists.

Table 4. Indirect domestic value added from tourism expenditure to total value added

Canada

Industry	Indirect domestic value added due to non-resident expenditures [1]	Total Value Added of industry [2]	Ratio [1/2]
	Millions USD		%
Air transport	196	6 471	3.0%
Travel agency	60	2 743	2.2%
Fishing	25	1 562	1.6%
Rental and leasing	195	12 885	1.5%
Petroleum	140	9 783	1.4%
Food, beverages and tobacco	406	29 303	1.4%
Advertising and market research	47	4 011	1.2%
Agriculture	232	22 908	1.0%
Employment services	66	7 086	0.9%
Security and investigation	275	32 590	0.8%

Portugal

Industry	Indirect domestic value added due to non-resident expenditures [1]	Total Value Added of industry [2]	Ratio [1/2]
	Millions USD		%
Rental and leasing	49	856	5.8%
Agriculture	122	2 534	4.8%
Food, beverages and tobacco	177	3 854	4.6%
Employment services	58	1 290	4.5%
Advertising and market research	18	461	4.0%
Printing and recording	16	425	3.7%
Electricity and gas	160	4 553	3.5%
Fishing	8	270	3.1%
Wholesale trade	346	11 443	3.0%
Legal and accounting	87	3 039	2.9%

United Kingdom

Industry	Indirect domestic value added due to non-resident expenditures [1]	Total Value Added of industry [2]	Ratio [1/2]
	Millions USD		%
Travel agency	260	11 189	2.3%
Food, beverages and tobacco	711	34 833	2.0%
Agriculture	238	14 665	1.6%
Fishing	12	899	1.4%
Textiles	88	7 119	1.2%
Advertising and market research	119	11 249	1.1%
Paper	59	5 611	1.0%
Warehousing	212	20 498	1.0%
Employment services	204	23 442	0.9%
Printing and recording	64	7 548	0.8%

Source: OECD Centre for Entrepreneurship, SMEs, Regions and Cities/OECD Statistics and Data Directorate calculations based on Canada (2012), Portugal (2015) and United Kingdom (2010) Supply and Use Tables.

Producing tourism trade in value added estimates at international level

The value added generated by tourism can be analysed at both the national and international level. Both show how output in the tourism sector uses inputs from other domestic industries and imports (OECD, 2014), and use the same baseline statistics data and analytical approaches. However, going beyond the national level and using international supply and use or input-out tables allows for the additional analysis of the detailed *breakdown*, by industry and country, of the intermediate imports used directly or indirectly by industries in the tourism value chain. In addition, an inter-country input-output table is necessary to calculate how much of the reporting country's own value added is embodied in its imports (reimported domestic value added), even if this is typically small - on average less than 0.5% of exports and even less so for services (OECD, 2014).

Demonstrating the potential of tourism trade in value added at international level

The figures below represent latest estimates using the inter-country input-output table to assess the domestic and imported value added generated by all non-resident expenditure in an economy. Like the results in the previous section, these include the value added generated by non-resident expenditure on accommodation and food services, but also on goods (consumption and durable), domestic transportation, etc. and all direct and indirect domestic value added embodied in those purchases.

Using an ICIO infrastructure, indicators can be developed to track, for example, the country and industry origin of value added in gross exports and final demand, or the domestic employment used in production to meet foreign final demand. With non-resident expenditures identified separately in the OECD's ICIO tables, inferences can be made about the ultimate origin of value added (and employment) generated by tourism activities, and the ultimate country of final demand partner countries for imports and exports.

Methodology, assumptions and limitations

The ICIO infrastructure – inter-country input-output tables for the world (Table 5) - that underpins the global TiVA approach is constructed by combining harmonised[4] national input-output tables (derived from harmonised national supply and use tables) with international trade in goods and services statistics, all adjusted to be consistent with the latest National Accounts main aggregates. The latest set of ICIO tables is available for the years 2005-2015 and covers 65 economies and 36 unique industries based on ISIC Rev. 4. They are available online (http://oe.cd/icio).

National input-output tables reflect the inter-relationships between domestic industries, and between industries and final demand categories (households, government, investment and exports). They also reflect how intermediate imports are used in producing goods and services, and how imports of final goods are consumed. However, these tables are not able to reflect how the intermediate consumption of an industry in one country drives output in

[4] Harmonised meaning common industry and product classifications (converted from national classifications if necessary) and, common table formats – practices vary across countries (and time) on how they construct Input-Output and Supply and Use tables. Sector classifications and National Accounts format are harmonised before national data sources are integrated into the ICIO model.

another i.e. they do not reveal the *origins* of imports nor the *destinations* of exports. With an ICIO framework, it is possible to estimate these flows.

The ICIO links production processes within and across countries and industries, and captures bilateral trade links and exchanges of intermediate goods and services. The construction of these tables is a data intensive process and presents many challenges, the main one being to identify and create links between exports in one country and the purchasing industries (as intermediate consumption) or final demand consumers in the importing country (OECD, 2013).

Table 5. Simplified Inter-Country Input-Output infrastructure

at basic prices		Intermediate demand						Final consumption and capital formation			Direct purchases by non-residents			Output
		Country A		Country B		Country C		Country A	Country B	Country C	Country A	Country B	Country C	
		Ind 1	Ind 2	Ind 1	Ind 2	Ind 1	Ind 2							
Country A	Ind 1													X(A1)
	Ind 2													X(A2)
Country B	Ind 1													X(B1)
	Ind 2													X(B2)
Country C	Ind 1													X(C1)
	Ind 2													X(C2)
Taxes less subsidies…		*… on intermediate products*						… on final products						
		NTZA1	NTZA2	NTZB1	NTZB2	NTZC1	NTZC2	FA	FB	FC	FA	FB	FC	
Value added		V(A1)	V(A2)	V(B1)	V(B2)	V(C1)	V(C2)							
Output		X(A1)	X(A2)	X(B1)	X(B2)	X(C1)	X(C2)							

International tourism activities captured here

Key:

Cross-border flows of **intermediate** goods and services	**Cross-border** flows of **final** goods and services
Domestic flows of **intermediate** goods and services	**Domestic** flows of **final** goods and services

Source: OECD.

One relevant feature of the OECD ICIO tables is that direct purchases by non-residents within a country are identified separate to exports. Another feature is the identification of resident expenditures abroad in the national input-output tables, which can be incorporated into the ICIO framework to measure the direct and indirect effects. In a perfect world with perfect information, it would be possible to decompose every single product in a tourism value chain to identify where the value added originated throughout the production chain. In practice, it is necessary to aggregate data, by exploiting national input-output tables.

The ICIO framework has contributed to various policy areas, allowing indicators to be developed providing insights on technology diffusion, embodied CO_2 and more recently Trade in Value Added (TiVA) and the impact of global value chains on jobs and skills. The potential of the ICIO framework to provide new insights into tourism activities is the focus of this report.

Constructing the ICIO tables is a very data intensive work and requires the compilation of much underlying data from national and international sources, including national input-output tables, supply and use tables, National accounts time series and bilateral trade in goods and services. The data then have to be transformed (or "harmonised") from national formats and classifications to common formats and standard industry and product

classifications before use in ICIO table construction. For a description of the construction of the inter-country input-output data, see chapter "Measuring trade in value added" in the *Interconnected Economies: Benefiting from Global Value Chains* (OECD, 2013).

The coverage of national statistics varies considerably. Inevitably, there are many missing data points that need to be estimated (data for certain years, industries or products, demand categories or combinations thereof). The first priority is available data in the national input-output and supply and use tables, at the most detailed level of industry and product. For countries where there is no information on non-resident expenditures by products in these tables, information from the TSA is used.

In most cases, the breakdown of non-resident expenditure data by product is not available in the national supply and use and input-output tables. Therefore in the inter-country input-output table, the product breakdown for inbound tourism expenditure from the Tourism Satellite Account is used to disaggregate the total non-resident expenditure data (converted to the relevant industry code).

As there are often discrepancies between aggregate TSA data and Balance of Payments data, product/categories shares to total coming from TSA are applied to aggregate BOP constraints (e.g. shares of hotels and restaurants to total non-resident expenditures). For a country with no information on non-resident expenditures by product in the input-output, supply and use and TSA tables, product distribution shares of total from available countries with similar characteristics are used (i.e. in terms of size of population and GDP).

Once constructed, an ICIO table containing estimates of non-resident direct purchases can be used to estimate the economic impact of the consumption of non-residents within a country. One strength of applying standard analytical techniques to ICIO tables is the identification of the direct and indirect (upstream) impact of tourism on a country's economy.

International tourism trade in value added indicators, results and policy relevance

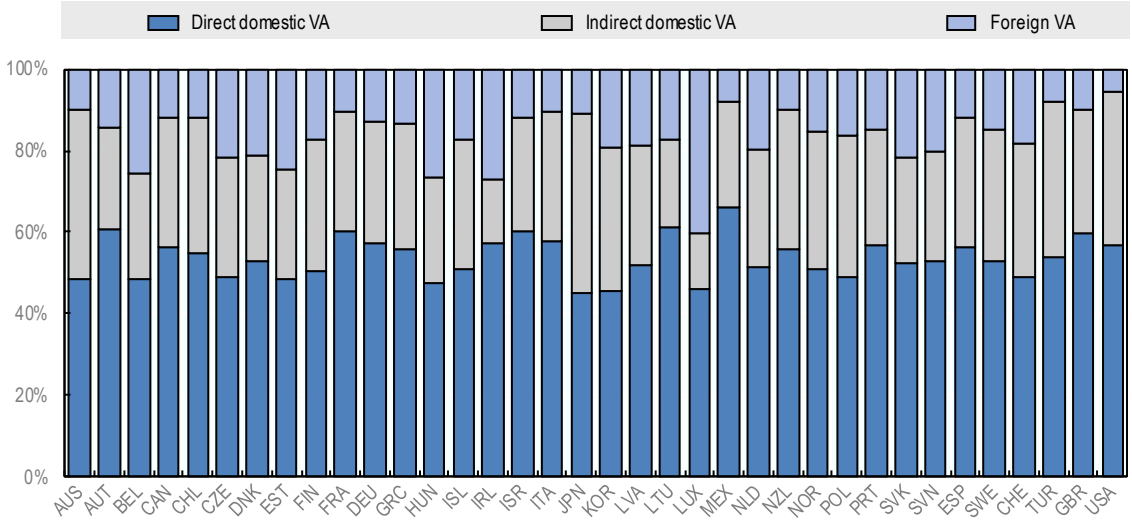
Analysis of tourism in the ICIO framework has generated the below indicators and estimates for OECD countries, to illustrate what is possible. This analysis has been prepared in co-operation with the OECD Directorate for Science, Technology and Innovation. Some variations in data are observed for Canada, Portugal and the United Kingdom compared with the foregoing national analysis due to the transformations required to harmonise national data to construct the ICIO tables, and different source years.

Domestic value added created by non-resident expenditure

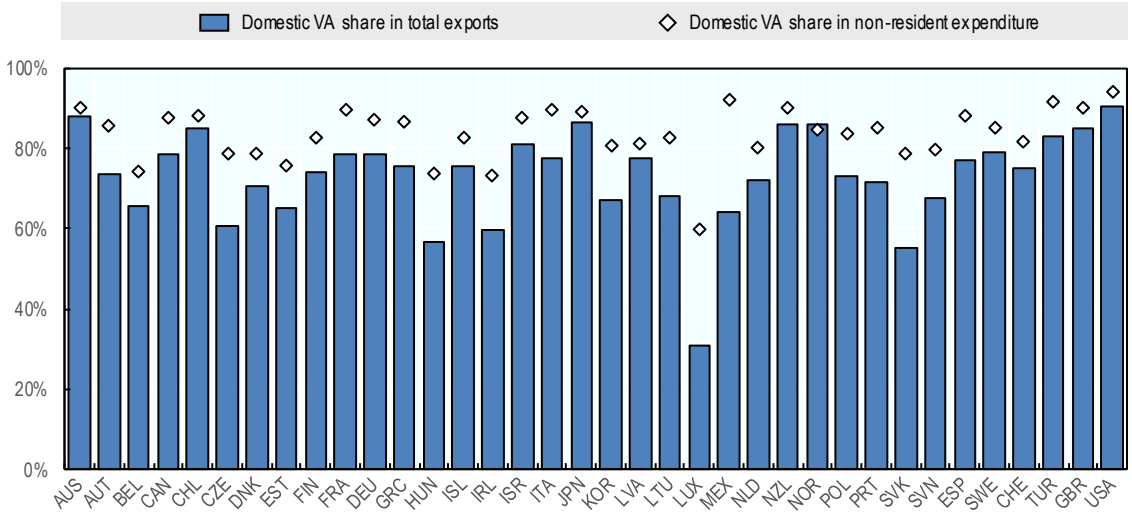
The bottom half of Figure 7 shows that the findings observed for Canada, Portugal and the United Kingdom, namely that while not all tourism expenditures result in domestic value added, their domestic value added share is higher than average (for exports) for the economy, hold across all countries OECD countries for which the analysis was performed.

Figure 7. Value added generated by non-resident expenditure

Sources of value added in non-resident expenditure



DVA/export ratio for tourism expenditure and for total economy



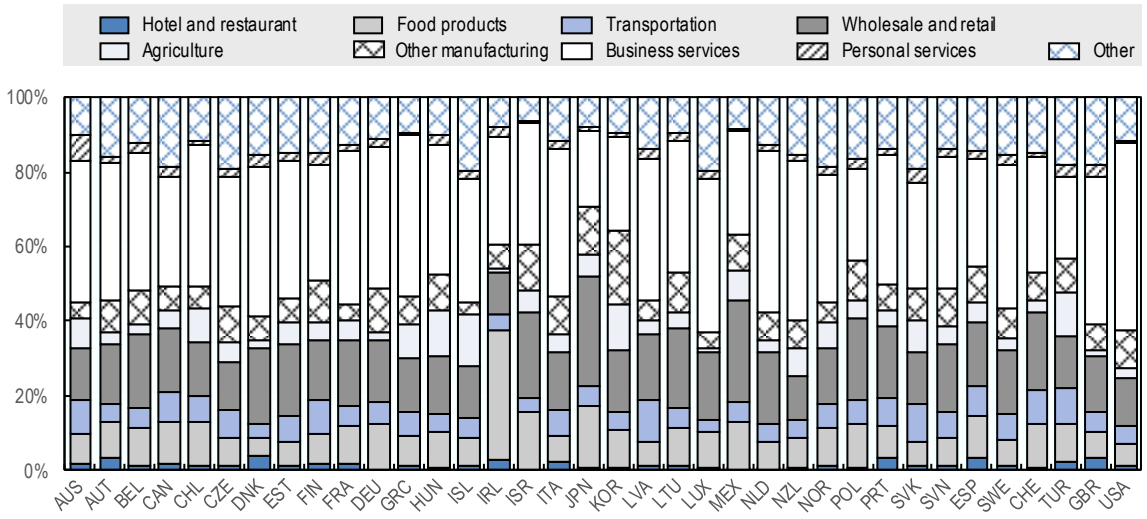
Source: OECD Inter-Country Input-Output, 2018.

Upstream effects of non-resident expenditure

On average, across all countries, 1 USD of non-resident expenditure results in 89 cents in domestic value added and 11 cents in foreign value added. Direct domestic value added represents 56 cents, while the indirect domestic value added represents 34 cents.

Looking at this another way, for each USD of direct domestic value added generated by non-resident tourism expenditure, an additional 61 cents of indirect value added is generated in upstream industries. Figure 8 illustrates how this upstream contribution is distributed, pointing again, like in the national examples for Canada, Portugal and the United Kingdom, to the important role of services as upstream providers to those industries that produce the products purchased by tourists.

Figure 8. Upstream effects of tourism expenditures



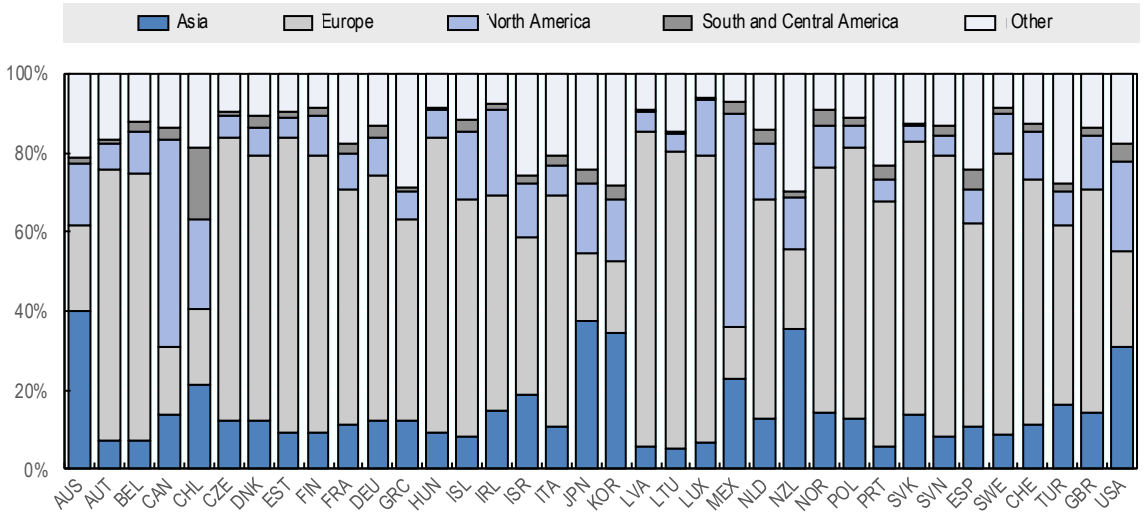
Source: OECD Inter-Country Input-Output, 2018.

Foreign value added created by non-resident expenditure by country of origin

While Figure 7 and Figure 8 could also be produced using national statistics (see the Canada, Portugal and United Kingdom example above), Figure 9 illustrates the additional information that can be derived from an inter-country input-output table.

As seen above, across OECD countries, around 11% of tourism expenditures result in value created in other countries (i.e. that is imported). Figure 9 shows the regions of origin of this foreign or imported value added created by non-resident expenditures in OECD countries.

Figure 9 Value added created by tourism expenditures by country of origin



Source: OECD Inter-Country Input-Output, 2018.

Toward a roadmap to better measure tourism trade in value added

This report provides a first assessment of how to analyse the value added generated by tourism, using existing national tourism statistics and OECD databases. The focus of these conclusions is on how TiVA related indicators could be developed to better understand the economic impact of tourism, and how the Tourism Committee's Working Party on Tourism Statistics could contribute to improvements in the quality of the underlying inter-country input output database infrastructure. The aim is to deepen understanding of how tourism statistics can be used in conjunction with other economic statistics to better understand and quantify globalisation, and better measure the value added created by tourism.

There is a high interest among OECD countries to work to better measure tourism from a trade in value perspective, to inform policy development and decision-making. This is evident from the strong response to the country survey and active engagement by countries in discussions on the issue. However, it is also evident that making progress on these issues will require statistical and policy engagement at national and international level, and prioritisation of the actions needed to advance. The availability of resources, human and financial, to undertake this work is also an issue.

Developing a future statistical agenda to better analyse tourism trade in value added

Strengthening the link between policy and statistical activities is important, to translate the demand on the part of policy makers to develop the type of data and statistical analysis required to support policy. This paper demonstrates the type of analysis possible, but also highlights some of the current statistical weaknesses and limitations which will need to be addressed to develop robust estimates for tourism.

This will require attention in the first instance on strengthening the underlying national level data for tourism, coherent with the system of national accounts and within the framework of internationally recognised standards. Improving the granularity and coherence of the national level data will in turn feed into the construction of the international ICIO model used to generate TiVA estimates. National statistical offices are best placed work on these issues, as they are most familiar with the data.

This is possible but complicated to do, and will require work on the part of the national statistical offices to bring together data from different sources that are not typically brought together, including the supply and use tables, TSA and ownership data within a common conceptual framework. The OECD can support the efforts of national statistical offices, including through the Expert Group on Extended Supply and Use Tables and the OECD-WTO Balanced Trade in Services initiative, as well as the Working Party on Tourism Statistics. The Tourism Satellite Account methodology and the IRTS framework also has a role to play here.

Strong policy demand will facilitate this process. A recognised weaknesses of the Tourism Satellite Account is the difficulty in clearly establishing and communicating the usefulness of this methodology to policy makers. Developing and communicating clearly the insights the work on measuring tourism from a value added perspective can bring to feed into policy making will be important to mobilise political support. Strengthening the link between the national statistical offices and tourism policy needs will be particularly important. Strong

co-ordination is needed to bring together different groups that do not traditionally work together, and promote synergies with the TSA.

With this in mind, it would beneficial to focus in the initial stages on identifying and developing a core set of key trade in value added indicators for tourism, supported by clear policy messaging. The indicators should be meaningful for policy makers, easy to communicate, and easy to understand. These could include:

- Domestic value added generated by non-resident expenditures, directly and indirectly, and by industry, and trend over time.
- Level and share of domestic value added generated by tourism exports, compared with overall exports and other key export industries, and trend over time.
- Foreign value added generated by non-resident expenditures, total, and by intermediate and partner country, and trend over time.

These indicators could help to shed light on the true value of tourism in the national economy, including how much of this value 'sticks' in the national economy, the relative importance of tourism in supporting export-led growth compared to other sectors, and the tourism source markets that generate the most value during their visit.

The indicators could also provide evidence on the breadth and depth of linkages between tourism and other sectors, and the backward linkages with the rest of the economy. It is also possible to do more depth analysis focusing on specific branches of the tourism sector (e.g. accommodation and food service, passenger transport). As the data infrastructure improves, the core indicator list may be expanded to include indicators on jobs, the role of SMEs, foreign ownership and CO_2 emissions.

Challenges and priority actions to strengthen the statistical foundations

This paper illustrates that using a value added perspective to analyse tourism provides useful and additional insights for policy makers on the benefits that accrue from tourism, and which industries benefit in particular. Clear opportunities exist to expand this work towards more countries and over time, to allow for cross-country comparisons and the analysis of trends in the indicators presented. Detailed sectoral analysis, particularly when taking advantage of the more detailed supply and use tables that are nationally available, are also a promising avenue of analysis using the approaches outlined above.

Realising this potential will require action at both national and international level to improve the statistical framework, guided by a clear understanding of how the TiVA framework relates to the TSA and other tourism statistics.

National statistical offices have an important role to play as the providers of the underlying national data, involving statisticians working on tourism, national accounts and trade statistics. There is also a clear role and need for an international organisation to co-ordinate and harmonise national statistics in order to create a multi-regional research tool. Such efforts are already underway to strengthen the overall TiVA framework, and underlying data. These efforts will need to be extended to take into account specific trade in tourism services issues.

More work is needed to improve the underlying official national statistics to strengthen the statistical framework. While much of this work sits with national account and trade statisticians, tourism statisticians also have a role to play, to ensure tourism-relevant issues are addressed. These include:

- **Greater granularity in national supply and use tables,** including in particular improvements in the breakdown of non-resident expenditure by product (as well as final consumption expenditures). Additional information on resident expenditures on tourism services would provide further insights on the value added generated by tourism. This will require underlying surveys and tourism data sources to be more consistent with national accounts and the supply and use tables.
- **Improvement of the quality and coverage of the Travel item in Trade in Services** statistics, including more detailed service category breakdowns, full partner country information (both EBOPS travel services breakdowns are encouraged) and reconciliation of trade asymmetries for travel. Addressing the asymmetry issue should be a priority, building on ongoing efforts in this area, including the OECD-WTO Balanced Trade in Services initiative (BaTIS), and the specific work on travel statistics at EU level. Integration of new data sources can also play a role (e.g. credit card).
- **Improvement of the implementation of the Tourism Satellite Account**, including the preparation of TSA Table 6 (and underlying Tables 4 and 5) with more complete and disaggregated data, specifically more detailed data on expenditures by CPA or CPC product classification. More detailed information on expenditure categories by country/region of origin of the tourist (inbound and domestic), and by country of expenditure (outbound).
- **Better alignment and timeliness of data sources**, consistent with the supply and use tables, national accounts and bilateral trade flows statistics. For example, the development of more detailed TSA data on expenditure by product should preferably be undertaken in collaboration with supply and use table compilers to provide inputs for non-resident purchases by product. Timely tourism statistics are needed, coherent with official estimates of gross output and value-added by industry and national accounts main aggregates of demand and trade, supplemented by bilateral trade statistics.

Areas for attention in the longer term

The analysis of tourism from a trade in value added perspective can shed new light on the relationships between the trade, production and consumption of tourism services. While the focus of this work is on linking tourism with the core TiVA framework, ongoing efforts to 'extend' the TiVA framework are opening up new possibilities, such as examining the impact of tourism on sustainability, or the role of large (foreign) operators and hotel chains in tourism GVCs.

There is important scope for additional analysis, including on jobs and labour compensation sustained by direct purchases by non-residents, the impact of firm size and ownership on value added to an economy from tourism, or CO_2 embodied in the consumption of non-residents. Such analyses would in particular require more detailed information on CO_2 emissions, jobs and labour compensation, and firm size and ownership consistent with national accounts, in addition to in particular more detailed statistics on tourism expenditures by product.

Jobs embodied in tourism exports

Estimates of trade in value added can help to clarify the link between tourism and employment in more detail, and to show where jobs are being created. A breakdown of the

contribution of each economy, including the domestic economy, to the value of exports can help. Traditional thinking about trade in gross terms typically regards imports as jobs lost and transferred to the countries in which the imports originate. In value added terms, a different picture emerges.

For example, workers may lose jobs at a certain production stage, but measures based on value added would show where jobs are created as a result of value added (in marketing, design, development, etc.). With a trade in value added approach, it is possible to calculate the share of domestic jobs embodied in exports, for example, or the number of jobs that are sustained by foreign final demand (OECD, 2017c).

From a statistical perspective, the approach used to analyse jobs is similar to the value added analysis. This requires good employment data broken down by industry, either number of jobs or (ideally) number of hours worked. Enhancing product information is also important to make employment analysis useful.

With detailed information on the products purchased by non-residents it is possible to calculate the jobs needed to produce these products, both in tourism and in upstream industries (e.g. agriculture). An additional consideration is to look at the type of employment, which is also being explored in the context of the extended supply and use tables.

It should be noted that with this analysis, it is not possible to control for labour productivity within the tourism sector. An additional push from tourism statisticians would be helpful, to explore to what extent it is possible to develop such information. A further issue is the repatriation of wages by foreign workers to their home country. The ICIO framework captures the number of people employed and labour compensation, but this would need to be combined with data from other sources (e.g. worker citizenship) to trace the repatriation of wages in the National Accounts framework.

Developing job-related estimates would require an additional effort with employment data, which is challenging in tourism. The OECD Employment Module detailing methodological issues will be an important reference to support this, as will ILO and UNWTO work to measure employment in tourism.

Impact of firm size and ownership on value added from tourism

Policy questions focus not only on in which country and industry tourism generates value added (or employment), but also in which firms.

Tourism is a sector by dominated by small and medium enterprises, which co-exist with a few large global players. One policy question is whether the benefits of tourism mostly accrue to large enterprises or do SMEs benefit as well, either directly (by providing goods and services to tourists) or indirectly (by supply larger enterprises that subsequently sell to tourists). There is potential use trade in value added analysis to show the contribution of SMEs to tourism exports in gross and value added terms – i.e. role of SMEs in international trade and GVCs greater than observed in gross export data alone.

Another important policy question that emerges when considering the value added that tourism generates directly and indirectly in countries is whether this value is generated by domestically or foreign controlled enterprises. This in turn raises the question of how much of this value added ‘sticks’ in the national economy, and how much may be repatriated to other countries.

Here, there is potential in the future to look at value added in terms of the ownership of tourism businesses, and see what impact this has on the impact of tourism on the economy in the reference country. This could show the domestic value added of domestic and foreign firms – plus the domestic value added of foreign firms broken down into labour compensation (which largely stays in the host economy) and operating surplus (which may leave the host economy, at least in part) – relevant for tourism.

Answering these questions will provide additional insights into the economic value of tourism in countries. These issues frequently receive attention in tourism, including the integration of domestic tourism and upstream businesses into the tourism value chain. However, data availability remains an issue and further statistical work is required to make such analysis possible. From a tourism perspective, a key question is to what extent it is possible to develop such breakdowns in the data, and are there particular tourism data sources which could support this.

The role of SMEs and foreign owned companies, and the level of domestic value added and employment they generate is relevant to tourism. To provide insights into these dynamics, information on the foreign ownership and the size of enterprises, by industry, as well as their value added, output, exports and imports are a key requirement.

This information can be used to develop Extended Supply and Use Tables that are the core 'tool' to provide answers to these questions by integrating disparate statistics. They also provide important scope for improved and coherent accounts, nationally and internationally, via global (extended) Supply and Use tables. However, foreign ownership and size of firms is not currently accounted for in the supply and use tables.

This is an experimental area of statistics for a number of countries, notably the United States, which is exploring the extension of the supply and use table framework to include an additional breakdown based on whether businesses are foreign or domestically owned and controlled. Canada has also started to link accommodation data with business registry information to obtain a breakdown of foreign ownership, suggesting potential for the future.

Initial indications from a number of countries suggest this is feasible, by linking accommodation surveys and business registers or other business statistic sources, for example. However, further work is needed. One challenge for example is how to extrapolate what part of business is tourism related. It is also not always easy to identify if a firm is foreign or domestically owned, given the ownership structures in tourism some of which are very specific to the sector (e.g. accommodation franchising).

Half of countries responding to the survey do not already have a coherent set of data on value added, output, exports and imports by either domestic/foreign ownership of firms or firm size, at least in the case of industries that are most relevant for tourism (such as accommodation, food and beverage services, passenger transport, tour operations). Developing such data is likely to be very difficult for these countries and remains experimental.

For other countries, some of this data is already available, such as value added and output, or it is possible in principle to get, such as exports and imports. However, this varies by country and further work is necessary to develop a coherent set of data across all four vectors (value added, output, exports and imports), for both domestic/foreign ownership and firm size.

Even where such data exists, it is not necessarily linked to the ownership or size of firms. Data availability and reliability is one challenge, but so too is the availability (or lack

thereof) of resources to explore the potential to develop such data. Other challenges include the difficulty in identifying 'tourism firms' and bringing together data from different and previously unlinked data sources.

Carbon emissions embodied in tourism exports

Another area in which the measurement of trade flows in value added terms would support policy making is assessments of the environmental impact of tourism trade. For example, concerns over greenhouse gas emissions and their potential role in climate change have triggered research on how tourism trade openness affects CO_2 emissions. The globalisation and international fragmentation of both the production and consumption of tourism require a value added view of trade to understand where CO_2 is produced as a consequence of tourism trade.

OECD has started to estimate CO^2 using final expenditure and calculating the impact generated by upstream industries. Industry impact of CO_2 emissions is calculated by industry based on carbon embodied in household consumption, in a similar way as value added is calculated. A key challenge from a tourism perspective is how to allocate the carbon embodied in household consumption from air passenger transport activities to the individual countries and bilateral trade flows.

Beyond carbon emissions, the negative impacts of trade in tourism services is relatively difficult to capture using the input-output approach. Tourism activities are relatively confined in limited geographical regions. The positive economic impacts of tourism are relatively widely spread across countries, and to neighbouring countries, while the negative consequences are limited in smaller geographical locations.

Mobilising political support and resources for the statistical work needed to make progress

Raising awareness of the opportunities which exist from integrating tourism into the TiVA framework will be important, to garner the support, and resources, required to strengthen the national statistical infrastructure to develop the additional granularity that is needed for high quality data. A related issue will be the need to ensure the output concerning tourism trade in value added is communicated in ways that are easily understood and interpreted by policy makers.

Mobilising political support will be necessary to bring together the different data (and actors) required to strengthen the statistical framework for analysing tourism using a trade in value added approach. Meaningful tourism trade in value added statistics and indicators should be presented in simple, unambiguous terms and efforts to developed robust tourism trade in value added indicators will need to be accompanied by effective communication to target audiences. A clear tourism policy demand for this statistical work which is already underway will provide an additional rationale for this work, and can support the allocation of additional resources required to accomplish it i.e. strengthen link between policy question and statistical work.

References

Eurostat (2016), Tourism Satellite Accounts in Europe, Eurostat, Luxembourg, https://ec.europa.eu/eurostat/documents/7870049/7880233/KS-FT-17-002-EN-N.pdf/1070ebdc-b9e1-4a93-abb8-cecd83d40f68

Eurostat (2018) Eurostat FIGARO project, Eurostat Working Party on Tourism Statistics, 8-9 October 2018, [TOU WG2018-Doc4.2b]

Fletcher, J. (1989) Input-Output analysis and tourism impact studies, Annals of Tourism Research, Vol. 16, pp. 514-529

Los, B. and Steenge, A. (2010) Tourism studies and input-output analysis: introduction to a special issue, Economic Systems Research, Vol.22 No. 4, pp. 305-311

OECD (2000), Measuring the Role of Tourism in OECD Economies: The OECD Manual on Tourism Satellite Accounts and Employment, OECD Publishing, Paris, https://doi.org/10.1787/9789264182318-en.

OECD (2006) Enhancing the role of SMEs in the global tourism industry, CFE/TOU(2006)9 (ONE)

OECD/World Trade Organization (2012) Trade in value added: concepts, methodologies and challenges, https://www.oecd.org/sti/ind/49894138.pdf

OECD (2013), "Measuring trade in value added", in *Interconnected Economies: Benefiting from Global Value Chains*, OECD Publishing, http://dx.doi.org/10.1787/9789264189560-en.

OECD (2014) Measuring Trade in Value Added, STD/CSSP/WPTGS(2014)18 (ONE)

OECD (2015) Linking TiVA and FDI statistics: first results and future plans, DAF/INV/STAT(2015)5 (ONE)

OECD (2016) Integration of FDI statistics in TiVA: Results and data challenges, COM/STD/WPTGS/DAF/WGIIS(2016)1 (ONE)

OECD (2016) Global value chains and trade in value added: an initial assessment of the impact on jobs and productivity, TAD/TC/WP(2015)10/FINAL (ONE)

OECD (2016) Tourism Trends and Policies 2016, OECD Publishing, Paris https://doi.org/10.1787/tour-2016-en.

OECD (2017a) Trade in Value added Database (International Trade and Balance of Payments) and associated metadata and technical notes

OECD (2017b) The OECD-WTO Balanced Trade in Services Database, http://www.oecd.org/sdd/its/OECD-WTO-Balanced-Trade-in-Services-database-methodology.pdf

OECD (2017c) A first look at the steel industry in the context of global value chains, DSTI/SC(2017)4 (ONE)

OECD tourism database, (Online), available: http://dotstat.oecd.org.

UNWTO, OECD, Eurostat (2008) Tourism Satellite Account: Recommended Methodological Framework 2008 (Luxembourg, Madrid, New York, Paris, 2008). http://www.oecd.org/cfe/tourism/tourismsatelliteaccountrecommendedmethodologicalframework.htm

UNWTO (2013) The Economic Impact of Tourism: Overview and Examples of Macroeconomic Analysis, UNWTO Statistics and TSA Issue Paper Series, UNWTO: Madrid, http://cf.cdn.unwto.org/sites/all/files/IP_Economic_Impact_EN.pdf

Annex A. List of industries and products in OECD Supply and Use Tables

Code	List of 65 industries	List of 65 products
01	Crop and animal production, hunting and related service activities	Products of agriculture, hunting and related services
02	Forestry and logging	Products of forestry, logging and related services
03	Fishing and aquaculture	Fish and other fishing products; aquaculture products; support services to fishing
B	Mining and quarrying	Mining and quarrying
10_12	Manufacture of food products, beverages and tobacco products	Food, beverages and tobacco products
13_15	Manufacture of textiles, wearing apparel, leather and related products	Textiles, wearing apparel, leather and related products
16	Manufacture of wood and of products of wood and cork,etc.	Wood and of products of wood and cork, except furniture; articles of straw and plaiting materials
17	Manufacture of paper and paper products	Paper and paper products
18	Printing and reproduction of recorded media	Printing and recording services
19	Manufacture of coke and refined petroleum products	Coke and refined petroleum products
20	Manufacture of chemicals and chemical products	Chemicals and chemical products
21	Manufacture of basic pharmaceutical products and preparations	Basic pharmaceutical products and pharmaceutical preparations
22	Manufacture of rubber and plastics products	Rubber and plastic products
23	Manufacture of other non-metallic mineral products	Other non-metallic mineral products
24	Manufacture of basic metals	Basic metals
25	Manufacture of fabricated metal products, except machinery and equipment	Fabricated metal products, except machinery and equipment
26	Manufacture of computer, electronic and optical products	Computer, electronic and optical products
27	Manufacture of electrical equipment	Electrical equipment
28	Manufacture of machinery and equipment n.e.c.	Machinery and equipment n.e.c.
29	Manufacture of motor vehicles, trailers and semi-trailers	Motor vehicles, trailers and semi-trailers
30	Manufacture of other transport equipment	Other transport equipment
31_32	Manufacture of furniture; other manufacturing	Furniture and other manufactured goods
33	Repair and installation of machinery and equipment	Repair and installation services of machinery and equipment

D	Electricity, gas, steam and air conditioning supply	Electricity, gas, steam and air conditioning
36	Water collection, treatment and supply	Natural water; water treatment and supply services
37_39	Sewerage; waste collection and management services	Sewerage services; sewage sludge; waste collection and management services
F	Construction	Constructions and construction works
45	Wholesale and retail trade and repair of motor vehicles and motorcycles	Wholesale and retail trade and repair services of motor vehicles and motorcycles
46	Wholesale trade, except of motor vehicles and motorcycles	Wholesale trade services, except of motor vehicles and motorcycles
47	Retail trade, except of motor vehicles and motorcycles	Retail trade services, except of motor vehicles and motorcycles
49	Land transport and transport via pipelines	Land transport services and transport services via pipelines
50	Water transport	Water transport services
51	Air transport	Air transport services
52	Warehousing and support activities for transportation	Warehousing and support services for transportation
53	Postal and courier activities	Postal and courier services
I	Accommodation and food service activities	Accommodation and food services
58	Publishing activities	Publishing services
59_60	Audiovisual and broadcasting activities	Audiovisual and broadcasting services
61	Telecommunications	Telecommunications services
62_63	IT and other information services	Computer programming, consultancy and related services; Information services
64	Financial service activities, except insurance and pension funding	Financial services, except insurance and pension funding
65	Insurance, reinsurance and pension funding, except compulsory S.S.	Insurance, reinsurance and pension funding services, except compulsory social security
66	Activities auxiliary to financial service and insurance activities	Services auxiliary to financial services and insurance services
68A	Imputed rents of owner-occupied dwellings	Imputed rents of owner-occupied dwellings
68B	Real estate activities excluding imputed rents	Real estate services excluding imputed rents
69_70	Legal, accounting, head offices, management consultancy activities	Legal and accounting services; services of head offices; management consultancy services
71	Architectural and engineering activities; technical testing and analysis	Architectural and engineering services; technical testing and analysis services
72	Scientific research and development	Scientific research and development services
73	Advertising and market research	Advertising and market research services
74_75	Other professional, scientific and tech. activities; veterinary activities	Other professional, scientific and technical services and veterinary services
77	Rental and leasing activities	Rental and leasing services
78	Employment activities	Employment services
79	Travel agency, tour operator, reservation service and related activities	Travel agency, tour operator and other reservation services and related services

80_82	Security, services to buildings and other business support activities	Security and investigation services; services to buildings and other business support services
O	Public administration and defence; compulsory social security	Public administration and defence services; compulsory social security services
P	Education	Education services
86	Human health activities	Human health services
87_88	Residential care and social work activities	Residential care services; social work services without accommodation
90_92	Arts; cultural activities; gambling and betting activities	Creative, arts, entertainment, library, archive, museum, other cultural services; gambling and betting services
93	Sports activities and amusement and recreation activities	Sporting services and amusement and recreation services
94	Activities of membership organizations	Services furnished by membership organisations
95	Repair of computers and personal and household goods	Repair services of computers and personal and household goods
96	Other personal service activities	Other personal services
T	Act. of HH as employers; undif. G&S-producing activities of HH for own use	Services of HH as employers; undifferentiated goods and services produced by HH for own use
U	Activities of extraterritorial organizations and bodies	Services provided by extraterritorial organisations and bodies

Source: OECD Statistics and Data Directorate Supply and Use Tables database.

Annex B. List of 36 industries in OECD Inter-Country Input-Output Table

	Corresponding ISIC Rev. 4 codes	
1	01, 02, 03	Agriculture, hunting, forestry and fishing
2	05, 06	Mining and extraction of energy producing products
3	07, 08	Mining and quarrying of non-energy producing products
4	09	Services to mining and quarrying
5	10, 11, 12	Food products, beverages and tobacco
6	13, 14, 15	Textiles, textile products, leather and footwear
7	16	Wood and products of wood and cork
8	17, 18	Paper products and printing
9	19	Coke and refined petroleum products
10	20, 21	Chemicals and chemical products
11	22	Rubber and plastics products
12	23	Other non-metallic mineral products
13	24	Basic metals
14	25	Fabricated metal products
15	26	Computers, electronic and optical equipment
16	27	Electrical equipment
17	28	Machinery and equipment, nec
18	29	Motor vehicles, trailers and semi-trailers
19	30	Other transport equipment
20	31, 32, 33	Manufacturing nec; repair of machinery and equipment
21	35 to 39	Electricity, gas, water supply, sewerage, waste and remediation services
22	41, 42, 43	Construction
23	45, 46, 47	Wholesale and retail trade; repair of motor vehicles
24	49 to 53	Transport, storage and postal services
25	55, 56	Accommodation and food services
26	58, 59, 60	Publishing, audio-visual and broadcasting activities
27	61	Telecommunications
28	62, 63	IT and other information services
29	64, 65, 66	Financial and insurance activities
30	68	Real estate activities
31	69 to 82	Other business sector services
32	84	Public admin. and defence; compulsory social security
33	85	Education
34	86, 87, 88	Health and social work
35	90 to 96	Arts, entertainment, recreation and other personal service activities
36	97, 98	Private households with employed persons

Source: OECD Inter-Country Input-Output, 2018.

Annex C. Inter-Country Input-Output Methodological Note

Source: OECD Directorate for Science, Technology and Innovation

Once constructed, an ICIO table containing estimates of non-resident direct purchases can be used to estimate the economic impact of the consumption of non-residents within a country. To achieve such analysis, the following long-established method is used:

For each year

Let the matrix $\boldsymbol{Z}$ or intermediate demand matrix ($N\ x\ N$ where N is the number of industries) hold the monetary flows of intermediate goods and services with elements $Z_{ij,c}$ from supplying sector i, (i =1… N), into a using sector j, (j=1… N), for country c within an economy.

Matrix $\boldsymbol{F}$ ($N\ x\ M$, where M is the number of final demand categories) represents the final demand of private (Households and Non-profit institutions serving households NPISH) and public consumption (government consumption), gross fixed capital formation (GFCF), changes in inventories and exports (cross border exports and direct purchases) and imports. Elements $F_{i,c,l,k}$ represent flows from supplying sector i, (i=1… N) in country c into final demand categories k, (k =1… M) in country l (where $c \neq l$).

Finally, the vectors $\boldsymbol{V}$ and $\boldsymbol{X}$, or primary inputs ($1\ x\ N$) represent value added and gross output (total production) with elements $V_{j,c}$ and $X_{j,c}$ respectively.

To calculate indicators of direct and indirect impacts, a global "*Leontief inverse matrix*" **B** needs is calculated:

$$\mathbf{B} = (\mathbf{I} - \mathbf{A})^{-1}$$

where **I** is an identity matrix (NxN) and **A** is a coefficient matrix with an element $a_{ij,c} = {Z_{ij,c}}/{X_{j,c}}$.

The value added multiplier is thus $\mathbf{VB} = \boldsymbol{diag}\left(\boldsymbol{VX^{-1}}\right)\mathbf{B}$,

Then, the domestic value added generated by non-resident expenditures ($\mathbf{NONRES_{DVA,c}}$) is

$$\mathbf{NONRES_{DVA,c}}\ (\boldsymbol{Total}) \quad = \sum_{\mathbf{1}}^{\boldsymbol{l}} \sum_{\mathbf{1}}^{\boldsymbol{j}} (\mathrm{VB}_{\boldsymbol{c,i}}\ \mathbf{F}_{\boldsymbol{i,c,k,l}}) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (\mathbf{1}\boldsymbol{a})$$

With elements $VB_{i,c,l}$ for supply industry i in country c and demand country l ($c \neq l$) and $F_{i,c,l,k}$ where k is the direct purchases category in the final demand block. Direct and indirect impacts can be written as

$$\mathbf{NONRES_{DVA,c}\ (Direct)} = \sum_{\mathbf{1}}^{\boldsymbol{l}} \left(\frac{V_{j,c}}{X_{j,c}}\ \mathbf{F}_{\boldsymbol{c,k,l}}\right) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (\mathbf{1}\boldsymbol{b})$$

$$\mathbf{NONRES_{DVA,c}}\ (\boldsymbol{Indirect}) = \mathbf{NONRES_{DVA,c}}\ (\boldsymbol{Total}) - \mathbf{NONRES_{DVA,c}}\ (\boldsymbol{Direct}) \ldots\ldots\ldots\ldots\ldots\ldots\ldots (\mathbf{1}\boldsymbol{c})$$

Finally, foreign value added content (backward linkages) $\boldsymbol{NONRES_{FVA_c}}$ of non-residents expenditures in country c can be written as

$$\mathbf{NONRES_{FVA,c}} = \sum_{\mathbf{1}}^{\boldsymbol{l}} [\mathbf{NONRES_{VA,c,l}}\ (\boldsymbol{Total}) - \boldsymbol{digonal}\ \left(\mathbf{NONRES_{VA,c,l}}\ (\boldsymbol{Total})\right)] \ldots (\mathbf{1}\boldsymbol{d})$$

Industries that serve tourism activities in the ICIO framework are, for instance, *Hotels and restaurants*, *Transportation*, and *Cultural and sports* activities. Other activities such as manufacture of *Food and beverages* as well as production of fuel and energy and other utilities are also important including those that whose products are "indirectly consumed" by non-residents (i.e. the expenditure created at the suppliers and their suppliers or second tier of the supply chains of a product).

Equation (1a) can be used to measure the domestic value added for a certain industry/sector. In other words, domestic value added generated in the *Hotels and restaurants* sector by non-residents expenditures ($NONRES_{DVA_{hotel,c,l}}$) can be presented as

$$NONRES_{DVA_{hotel,c,l}} = VB_{hotel,c}\ F_{c,l,k} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (\mathbf{2})$$

The ICIO framework has contributed to various policy areas, allowing indicators to be developed providing insights on technology diffusion, embodied CO2, and more recently Trade in Value Added (TiVA) and the impact of Global Value Chains (GVCs) on jobs and skills. The potential of the ICIO framework to provide new insights into tourism activities should be explored further.