

OXFORD ECONOMICS

Methodology

**WTTC / Oxford Economics 2020
TRAVEL & TOURISM
ECONOMIC IMPACT RESEARCH**

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Contents

1	Introduction.....	1
2	Conceptual Overview.....	3
3	TSA Benchmarking.....	9
4	Travel & Tourism Demand.....	13
5	Travel & Tourism Supply	23
6	Wider Impacts	27
	Appendix A: Recap of Major Methodological Changes in 2020.....	31
	Appendix B: Recap of Major Methodological Changes Between 2011 and 2019 ..	32

1 Introduction

1.1 Purpose of the research

The main objective of the WTTC/Oxford Economics economic impact research (EIR) is to provide, on an annual basis - consistent, reliable, timely and comparable data and forecasts to assess Travel & Tourism's contribution to national economic activity.

This includes the number of jobs and GDP created by the Travel & Tourism sector, both directly and in total, and measured as a percentage contribution of total economy employment and GDP.

An increasing number of countries are compiling elements/full Tourism Satellite Accounts (TSA) which can provide more detailed statistics than this research. The WTTC/Oxford Economics research is designed to complement country TSA exercises by providing:

- Timely estimates up to the current year (in some cases the latest year for own country TSAs is several years back);
- Direct comparability across all countries by employing the same methodology;
- A global and regional perspective of the contribution of Travel & Tourism;
- An aid to policy decisions in countries unable to fund elements of or a full TSA;
- Analysis to benchmark with the economic contribution of other industries;
- Help in understanding linkages to other industries in the economy;
- Ten-year forecasts ahead to 2030; and
- A modelling tool and basis for scenario and policy analysis.

1.2 Approach

The underlying approach is to use existing data on Travel & Tourism wherever possible, and to fill in the gaps by supplementing data with estimates derived from the typical relationship between the missing information and other economic and Travel & Tourism indicators where necessary.

Using actual and estimated data, we apply the UN WTO Statistics Division-approved TSA methodology (TSA:RMF 2008) to quantify the direct contribution of Travel & Tourism.

But we are also interested in measuring the wider economic impacts of Travel & Tourism. So, we also compile indirect impacts from the supply chain of Travel & Tourism suppliers and Travel & Tourism investment, and induced impacts as direct and indirect workers in the Travel & Tourism sector spend their income.

WTTC and Oxford Economics are committed to the ongoing improvement of the methodologies used in this EIR. In 2020, we undertook a major exercise to refresh and enhance the input output methodology component of the EIR. For many of the smaller Travel & Tourism economies covered by the research that do not have a TSA to benchmark to, a core aspect of the methodology uses input output tables to translate Travel & Tourism spending data into direct and total GDP and employment estimates. For the 2020 EIR, while the underlying conceptual approach remains consistent with that used in previous years, a much richer

underlying set of input output tables are now available and have been incorporated to enhance the accuracy of these estimates. Full details of the methodology used are provided throughout this document, while Appendices A and B provides a summary of all of the main methodology changes made in the research over recent years, including the input output enhancements made in 2020.

1.3 Report structure

This document sets out in detail our Travel & Tourism economic impact methodology, and is structured as follows:

- Chapter 2 sets out the **conceptual overview** to measuring the contribution of Travel & Tourism;
- Chapter 3 provides an update of **TSA benchmarking** data used from country TSAs published by national country statistics offices and other bodies;

Seven new countries with TSAs added in the 2020 EIR:

- Bangladesh
- Croatia
- Egypt
- Estonia
- Fiji
- Puerto Rico
- Thailand

In total, 61 countries are now included in the TSA Benchmarking exercise, representing around 88% of global direct Travel & Tourism activity.

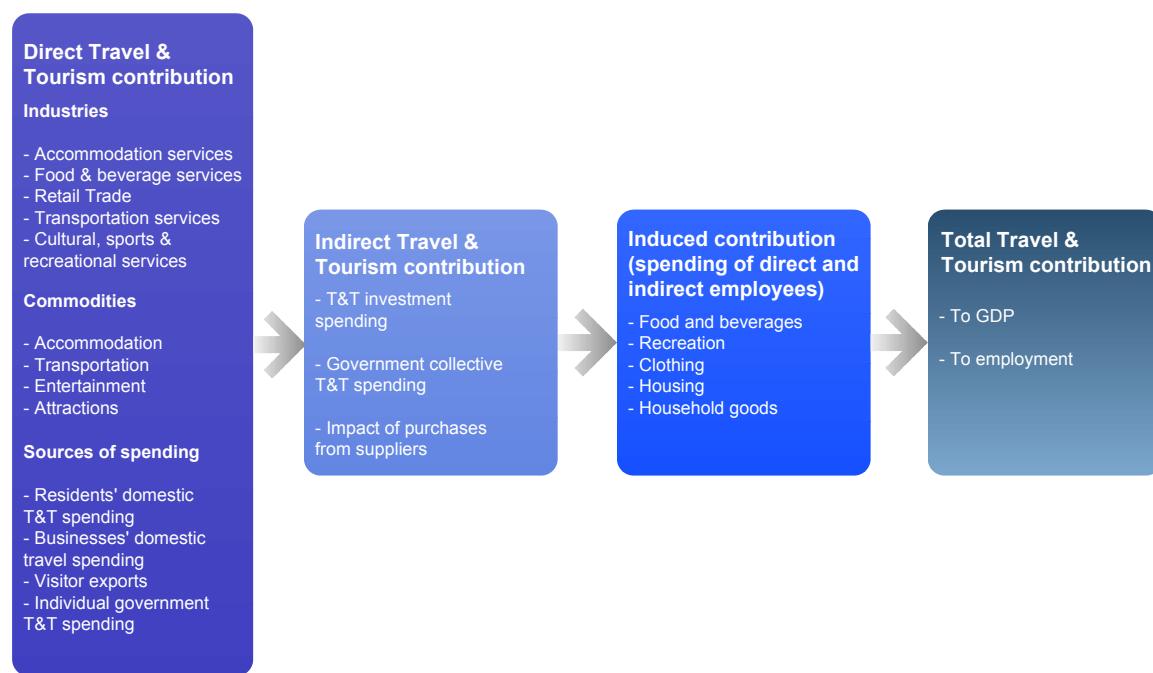
- Chapter 4 looks in more detail at measuring Travel & Tourism **demand**;
- Chapter 5 summarises the method for Travel & Tourism **supply**; and
- Chapter 6 focuses on measuring the **wider impacts** of Travel & Tourism, namely indirect and induced impacts.
- Appendices A and B recap briefly the more extensive methodological changes made since the 2011 research, including methodological enhancements made in the 2020 EIR

2 Conceptual Overview

2.1 Conceptual approach

Travel & Tourism is an important economic activity in most countries around the world. As well as its direct economic impact, the sector has significant indirect and induced impacts.

The UN WTO Statistics Division-approved TSA methodology (TSA: RMF 2008) quantifies only the direct contribution of Travel & Tourism. WTTC recognises that Travel & Tourism's total contribution is wider and aims to capture its indirect and induced impacts through its annual research.



In practical terms, WTTC/Oxford Economics have implemented the TSA: RMF (2008) by:

- Applying the definition of Travel & Tourism to develop a method for computing the demand-side components of Travel & Tourism GDP: consumer spending, government consumption, investment and net exports; and
- Using input-output tables to translate demand-side expenditures into supply-side outputs, and to split total GDP and employment into direct and indirect components. Significant methodology improvements have been made in the 2020 EIR to make use of a much richer underlying set of input output tables now available.

The objective is to be both as comprehensive as possible – to ensure the importance of Travel & Tourism is not under-estimated – and as consistent as possible – to allow cross-country and cross-regional comparisons – so that global estimates of the contribution to GDP and employment from Travel & Tourism can be accurately derived. The input-output methodology improvements implemented in the 2020 EIR help to further achieve these two objectives.

2.1.1 Direct Travel & Tourism Contribution-

The direct contribution of Travel & Tourism to GDP reflects the:

- 'Internal' spending on Travel & Tourism - total spending within a particular country on Travel & Tourism by residents and non-residents for business and leisure purposes.
- As well as government 'individual' spending - spending by government on Travel & Tourism services directly linked to visitors, such as cultural (e.g. museums) or recreational visitors (e.g. national parks).
- The direct contribution of Travel & Tourism to GDP is calculated to be consistent with the output of tourism-characteristic sectors such as hotels, airlines, airports, travel agents and leisure & recreation services that deal directly with tourists.
- The direct contribution of Travel & Tourism to GDP is calculated from total 'internal' spending by netting out the domestic and imported purchases made by the different tourism sectors. This is consistent with the definition of Travel & Tourism GDP, specified in TSA: RMF (2008). The input-output methodology improvements implemented in the 2020 EIR help to more accurately estimate domestic and imported purchases.

2.1.2 Total Travel & Tourism Contribution – Indirect and Induced Contribution

The total contribution of Travel & Tourism includes its wider impacts on the economy (i.e. the indirect and induced impacts), in addition to direct impacts.

The indirect contribution includes the GDP and jobs supported by:

- Travel & Tourism investment spending – an important aspect of both current and future activity that includes investment activity such as the purchase of new aircraft and construction of new hotels. In the UNWTO's TSA Recommended Methodological Framework (2008), Travel & Tourism investment is classified into three main categories as follows: (a) Tourism-specific fixed assets; (b) Investment by the tourism industries in non-tourism-specific fixed assets; (c) Tourism-related infrastructure.
- Government 'collective' spending, which helps Travel & Tourism activity in many ways as it is made on behalf of the 'community at large' – e.g. tourism marketing and promotion, aviation, administration, security services, resort area security services, resort area sanitation services etc.
- Domestic (non-imported) supply chain purchases of goods and services by the sectors dealing directly with tourists - including, for example, purchases of food and cleaning services by hotels, of fuel and catering services by airlines, and IT services by travel agents. Imported purchases are not included as part of the indirect contribution as these represent leakages.

The induced contribution measures the GDP and jobs supported by the spending of those who are directly and indirectly employed by the Travel & Tourism sector. The input-output methodology improvements implemented in the 2020 EIR help to more accurately estimate induced impacts.

2.2 Demand-side perspective

The demand-side perspective is based on overall spending in the economy on Travel & Tourism activity, whether by households, businesses, overseas visitors or government.

We estimate the following demand-side components of Travel & Tourism:

1. **Visitor exports** - spending in the domestic economy by foreign visitors, excluding education-related travel but including medical tourism. We also split this into personal and business foreign visitor spending.
2. **Resident domestic Travel & Tourism expenditure** - spending in the domestic economy by domestic residents. Again, we split this into personal and business spending. For completeness, we also estimate spending abroad by domestic households and businesses (excluding education but including medical), although this is not part of tourism demand for the domestic economy (but forms part of tourism visitor export demand in the destination country). However, spending in advance of a trip is included as part of resident domestic Travel & Tourism expenditure.
3. **Government spending** on Travel & Tourism, split into individual and collective spending, as described above.
4. **Capital investment** associated with Travel & Tourism, both private and public.

Internal tourism consumption is defined as the sum of 1 and 2 above, plus government individual Travel & Tourism spending. It is this spending - less domestic and imported supply-chain purchases by Travel & Tourism providers (available/derived from published TSAs or estimated from input-output tables) - that is reflected in Travel & Tourism's direct contribution to GDP

Other demand elements – government collective Travel & Tourism spending and Travel & Tourism capital investment - are included in the indirect contribution of Travel & Tourism.

In defining Travel & Tourism activity, we have followed the TSA: RMF (2008):

Travel & Tourism is “*the activity of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes not remunerated from within the place visited*”.

The phrase “*usual environment*” is introduced to exclude from the concept of ‘visitor’ persons commuting every day between their home and place of work or study, or other places frequently visited.

Defining “usual environment” in terms of distance, duration or locality has obvious limitations. Travel to work, on the one hand, and travel on holiday, on the other, cover wide and overlapping ranges of distance and time. Therefore, the definition of what kinds of travel are included in Travel & Tourism may and do vary from time to time, place to place and country to country. To avoid this problem, we believe that the definition of Travel & Tourism must resist strict distance, duration or locality criteria, and rest on the broader view of travel “*beyond the usual environment*” using statistical approaches where available to interpret “*usual environment*.” Our philosophy is to let those who travel determine with their data when and where to draw the line between “*usual environment*” and Travel & Tourism.

We approach this in two ways:

- Where there are transportation surveys that divide trips by mode, distance and purpose, we interpret “*usual environment*” for each mode and purpose of travel as the mean distance

travelled plus two standard deviations. Two standard deviations are generally recognized by statisticians to be outside the norm.

- Where consumer expenditure surveys ask questions as to the amount of an expenditure made “*out of town*”, “*on a trip*”, or “*on vacation*”, we take this to mean outside the “*usual environment*”.

This method allows “*usual environment*” to be defined by consumers, rather than by an arbitrary, and possibly inappropriate, distance cut-off.

All personal consumption before, during and after a trip, which is directly associated with the trip, such as travel expenses, lodging, meals and various other purchases, is included in Travel & Tourism consumer spending. Expenses incurred by friends, relatives and business associates on the traveller’s behalf are also included.

2.3 Supply-side perspective

The TSA: RMF (2008) defines three supply-side economic aggregates that characterise the magnitude of Travel & Tourism:

- Gross value added of the characteristic Travel & Tourism industries (GVATI);
- Travel & Tourism direct gross value added (TDGVA); and
- Travel & Tourism direct GDP (TDGDP).

The first of these differs from the others in focusing on Travel & Tourism-characteristic industries, so it includes the output of these industries, whether they are supplied to visitors or not (e.g. restaurant meals consumed by locals), while excluding output of non-tourism-characteristic industries supplied to visitors (e.g. retail shopping while on holiday). Some country TSAs publish Travel & Tourism employment for the wider characteristic industries which over-estimates Travel & Tourism employment as defined by the TSA: RMF (2008) definition above.

The second and third supply-side concepts focus on output supplied to visitors whatever industry – characteristic or not – produces it. These two differ however in that value added is measured at basic prices while GDP is measured at purchasers’ prices (i.e. includes net taxes on products and imports). None of these three concepts includes the indirect value added created by Travel & Tourism via its supply chain, nor its induced impact.

The WTTC/Oxford Economics approach essentially aims to measure the equivalent of the third of these concepts – Travel & Tourism direct GDP (TDGDP).

We take advantage of the equivalence of the expenditure measure of GDP and the output measure when appropriately defined.

So Travel & Tourism’s direct contribution to GDP is calculated as the sum of the demand components making up tourism consumption (personal domestic Travel & Tourism spending, business domestic Travel & Tourism spending, foreign visitor Travel & Tourism spending and government individual Travel & Tourism spending) minus domestic and imported supply-chain purchases by Travel & Tourism providers (available/derived from published TSAs or estimated from input-output tables).

To separate the supply-chain purchases that represent the indirect rather than direct contribution to GDP, we use an input-output approach relating the output of each industry to the components of Travel & Tourism

demand. By weighting together the ratio of value added to output in these industries, we can divide the output equivalent of Travel & Tourism consumption into the sector's own direct value added (and hence the equivalent of TSA: RMF concept of TDGDP) and the indirect value added of other industries in the supply chain generated by the intermediate purchases of the direct producers.

We also define a wider concept of the total contribution of Travel & Tourism which includes not just Travel & Tourism consumption and its associated supply-chain value added, but also goods and services produced more widely on behalf of the tourist from collective government spending and fixed investment, and induced effects of Travel & Tourism through the spending of workers directly and indirectly employed in the Travel & Tourism sector.

Travel & Tourism's total contribution to GDP is calculated as the:

- Direct contribution;
- Plus indirect supply-chain purchases (domestic only excluding imports), plus government collective Travel & Tourism spending, plus Travel & Tourism fixed investment;
- Plus induced contribution.

2.4 Historical estimation

Our underlying approach is to use existing data on Travel & Tourism wherever possible, and to fill in the gaps by supplementing this data with estimates derived from the typical relationship between the missing information and other economic indicators where necessary. We also benchmark our estimates with countries' own partial/full TSAs each year, which in practice means taking countries' own partial/full TSAs results directly as input data.

More details on estimation are provided in the following chapters.

2.5 Forecasts

Forecasts for Travel & Tourism variables are based in the first instance on Oxford Economics' global macroeconomic forecasting service. The 2020 WTTC/Oxford Economics economic impact research is consistent with Oxford Economics' February 2020 global macroeconomic forecasts, and assumptions at the time for COVID-19 developments and restrictions on wider economic and Travel & Tourism specific activity. But clearly both economic and COVID-19 developments have changed and worsened significantly which will lead to weaker short and medium-term forecasts and much greater uncertainty around the outlook.

For each of the main countries, Oxford Economics' models provide forecasts for macroeconomic variables such as GDP, employment, private consumption (including a breakdown by COICOP categories used to forecast resident total and domestic Travel & Tourism expenditure, a new methodology improvement in 2016), government consumption, fixed investment in the private and public sectors, and exports and imports of goods and services.

This view of the global outlook is used to produce consistent forecasts of the key macroeconomic series for all countries covered in the research.

Using these forecast aggregates and the detailed consumer COICOP breakdown, additional variable detail required to calculate Travel & Tourism estimates is obtained by projecting the trends of the historical shares

for the respective aggregates. Additional information on producing the forecasts is included as appropriate in each section of the following chapters.

3 TSA Benchmarking

The enhancements to our methodology since 2011 make it clearer that our approach to measuring the direct contribution of Travel & Tourism to GDP and employment is consistent with the approach adopted in the increasing number of detailed individual country TSAs being published by national statistical offices and other government agencies.

Where possible we have used these existing individual TSAs to benchmark our figures for the relevant country. **In total, 61 countries are included in the TSA Benchmarking exercise, representing around 88% of global direct Travel & Tourism activity.**

It is worth bearing in mind, however, that:

- Data limitations mean that even when countries have produced TSAs, many countries do not publish estimates for all the concepts we aim to cover and are not necessarily able themselves to follow the TSA:RMF (2008) completely.
- In some cases, the latest year for published TSAs is several years back.
- We continue to use consistent international sources for elements of TSAs that are available in this form, such as foreign visitor spending (both inbound and outbound). In other words, we do not use foreign visitor spending from TSAs, instead relying on sources such as IMF balance of payments, although in most cases the figures are very similar.

This means that even when we have benchmarked the data for a particular country, not all the figures for that country will be derived from the TSA. The table below summarises the benchmarked data for each country where we have included at least some results from the TSAs. **Seven new TSA countries were added this year and are shaded – Bangladesh, Croatia, Egypt, Estonia, Fiji, Puerto Rico and Thailand.**

Looking at each column in turn:

- Residents' spending domestically (RSD) is the variable most widely available from existing TSAs, and we have used this data directly where possible.
- In a limited number of cases we also or alternatively have data for business travel (COMPTRAV) or domestic demand (DOMTT) from the TSAs. Where we do not have separate RSD data, we have used the DOMTT data to estimate RSD. Where we have both, we have used them to estimate COMPTRAV.
- Where we just have DOMTT demand from the UNWTO compilation, we have used this to estimate DOMTT, while retaining our own estimates of COMPTRAV.
- Travel & Tourism investment (IFTT) is only available from a very limited number of TSAs.
- Productivity (PROD) is taken from TSAs where available and used to estimate Travel & Tourism direct employment from our Travel & Tourism direct GDP estimates. (Note that we use productivity rather than taking the TSA employment numbers directly since in some cases differences in other inputs such as visitor exports or implied supply chain estimates mean that we do not necessarily have exactly the same direct GDP estimates).
- The split of demand into direct and indirect GDP (IDIR%SH) is used in a range of countries where this can be derived from the TSA data we have or is implicit in the WTO compilation of TSA statistics. For non-TSA benchmark countries, input-output tables are used to inform this split.

Summary and update of TSA benchmarking

Variable description	Residents' spending domestically (TSA)	Business travel spending / Total domestic T&T spending (TSA)	Total domestic T&T spending (WTO)	T&T investment (TSA)	Productivity (TSA)	Split of demand into direct and indirect GDP (TSA)	Split of demand into direct and indirect GDP (WTO)
Mnemonic	RSD (TSA)	COMPTRAV / DOMTT (TSA)	DOMTT (WTO)	IFTT (TSA)	PROD (TSA)	IDIR%SH (TSA)	IDIR%SH (WTO)
Australia	Y	Y			Y		
Austria	Y	Y			Y	Y	
Albania	Y	Y			Y	Y	
Bahamas	Y			Y		Y	
Bangladesh	Y	Y			Y	Y	
Bermuda	Y			Y	Y	Y	
Botswana	Y	Y				Y	
Bulgaria	Y	Y				Y	
Canada	Y	Y			Y	Y	
Chile	Y	Y					Y
China							Y
Colombia	Y				Y		Y
Croatia	Y	Y				Y	
Cyprus		Y	Y				Y
Czech Republic	Y	Y		Y	Y	Y	
Denmark	Y	Y			Y	Y	
Ecuador	Y	Y			Y	Y	
Egypt	Y	Y				Y	
Estonia	Y	Y		Y	Y	Y	
Fiji	Y	Y			Y	Y	
Finland	Y	Y					
France	Y	Y					
Germany	Y	Y			Y	Y	
Honduras		Y					
Hong Kong							
Hungary	Y	Y			Y	Y	
Iceland	Y	Y			Y	Y	
India	Y	Y			Y		
Indonesia	Y	Y			Y		Y
Ireland							
Israel	Y						
Italy	Y	Y					
Japan	Y	Y			Y	Y	
Jordan	Y	Y			Y	Y	
Kazakhstan							
Latvia							
Lithuania							
Macau							
Malaysia	Y	Y			Y	Y	
Malta	Y	Y			Y	Y	
Mauritius	Y	Y				Y	
Mexico	Y	Y				Y	
Morocco							
Netherlands	Y	Y			Y	Y	
New Zealand	Y	Y			Y	Y	
Nicaragua	Y						
Norway	Y	Y			Y	Y	
Oman	Y	Y				Y	
Peru	Y				Y		
Philippines	Y	Y		Y	Y		
Poland							
Portugal	Y	Y			Y	Y	
Puerto Rico	Y	Y			Y	Y	
Qatar	Y	Y		Y	Y	Y	
Romania							
Saudi Arabia	Y	Y		Y	Y	Y	
Slovakia							
Slovenia							
South Africa	Y	Y			Y	Y	
South Korea	Y	Y			Y		
Spain	Y	Y			Y		
St Lucia	Y				Y	Y	
Sweden	Y	Y			Y	Y	
Switzerland	Y	Y			Y		Y
Thailand	Y	Y		Y	Y	Y	
Vietnam	Y	Y				Y	
UAE	Y	Y		Y	Y	Y	
UK	Y	Y			Y	Y	
Uruguay	Y	Y				Y	
US	Y	Y			Y	Y	

In addition to adding seven new TSA countries – Bangladesh, Croatia, Egypt, Estonia, Fiji, Puerto Rico and Thailand (shaded grey above) - there have been a number of additional updates to existing TSA-benchmarked countries in the 2020 EIR:

- Australia – one new year of TSA data, including historical revisions in all years;
- Austria – one new year of TSA data, including historical revisions in all years;
- Bulgaria – one new year of TSA data, including historical revisions in all years;
- Canada – one new year of TSA data, including historical revisions in all years;
- China – one new year of partial TSA data;
- Colombia – two new years of TSA data;
- Czech Republic – one new year of TSA data, including historical revisions in all years;
- Denmark – one new year of TSA data;
- Finland – one new year of TSA data, including historical revisions in all years;
- France – one new year of TSA data, including historical revisions in all years;
- Hungary – one new year of TSA data, including historical revisions;
- India – one new year of TSA data, including historical revisions;
- Israel – one new year of TSA data, including historical revisions;
- Jordan – four new years of TSA data, including historical revisions;
- Lithuania – three new years of TSA data;
- Macau – one new year of TSA data;
- Malaysia – one new year of TSA data;
- Mauritius – seven new years of TSA data, including historical revisions in all years;
- Mexico – one new year of TSA data;
- New Zealand – one new year of TSA data, including historical revisions in all years;
- Norway – one new year of TSA data, including historical revisions;
- Philippines – one new year of data, including historical revisions;
- Portugal – one new year of TSA data, including historical revisions;
- Saudi Arabia – two new years of TSA data;
- Slovenia – two new years of TSA data;
- South Africa – two new years of TSA data, including historical revisions;
- Spain – one new year of TSA data; including historical revisions;
- Sweden – one new year of TSA data, including historical revisions;
- UK – one new year of TSA data, including historical revisions; and
- US – one new year of TSA data, including historical revisions.

The table below provides an overall summary of all countries that publish TSA data and the years for which published TSA data are available, which is incorporated into the 2020 EIR.

Summary of TSA benchmarking coverage

Country	TSA / WTO	Years available	Country	TSA / WTO	Years available
Australia	TSA	1997-2018	Lithuania	TSA	2005-17
Austria	TSA	2000-18	Macau	TSA	2010-2017
Albania	TSA	2009	Malaysia	TSA	2005-18
Bahamas	TSA	2003-04, 2007	Malta	TSA	2010
Bangladesh	TSA	2011	Mauritius	TSA	2005-17
Bermuda	TSA	2007-17	Mexico	TSA	2003-18
Botswana	TSA	2005, 2009, 2016	Netherlands	TSA	2001-06
Bulgaria	TSA	2010-16	New Zealand	TSA	1999-2017, 2019
Canada	TSA	1994-2018	Nicaragua	TSA	2005-13
Chile	TSA	2003-06	Norway	TSA	2004-2017
China	CNTA	1994-2019	Oman	TSA	2005-2017
Colombia	TSA	2001-05, 2017-18	Peru	TSA	2001-02
Croatia	TSA	2000, 2016	Philippines	TSA	2000-18
Czech Republic	TSA	2003-2017	Portugal	TSA	2000-08, 2014-17
Denmark	TSA	2008-17	Puerto Rico	TSA	2018
Ecuador	TSA	2007-16	Qatar	TSA	2013-17
Egypt	TSA	2011-17	Saudi Arabia	TSA	2002-11, 2013, 2018
Estonia	TSA	2000-14	Slovenia	TSA	2009, 2012, 2014-17
Fiji	TSA	2002, 2008, 2011-2013	South Africa	TSA	2005-2018
Finland	TSA	2011-17	South Korea	TSA	2014-2017
France	TSA	2005-17	Spain	TSA	2000-18
Germany	TSA	2010, 2015	St Lucia	TSA	2008
Hong Kong	TSA	2000-14	Sweden	TSA	2000-18
Hungary	TSA	2004-16	Switzerland	TSA	2001-17
Iceland	TSA	2001-17	Thailand	TSA	2010-15
India	TSA	2009, 2015	United Arab Emirates	TSA	2012, 2015
Indonesia	TSA	2013-16	United Kingdom	TSA	2008-17
Israel	TSA	2006-12, 2015	United States	TSA	2000-2018
Italy	TSA	2010, 2015	Uruguay	TSA	2005-2017
Japan	TSA	2004-15	Vietnam	TSA	2013-17
Jordan	TSA	2010-2016			

4 Travel & Tourism Demand

4.1 Visitor spending

4.1.1 Data

Data on visitor expenditures of residents abroad (outbound) and of foreign nationals domestically (inbound) are available for nearly all countries and comprise the international spending portions of the WTTC/Oxford Economics TSA accounts.

Foreign Visitor Spending (FVS) represents Travel & Tourism services exports and Resident Spending Abroad (RSA) represents Travel & Tourism services imports.

We use detailed balance of payments data collated by the IMF, which is consistent with UNWTO's data on foreign tourism spending and receipts in most cases.

This covers spending on passenger fares, whether this consists of a country's residents buying air tickets on foreign airlines or foreign visitors buying tickets from domestic airlines, as well as residents' spending on goods and services while abroad and foreign visitors' spending on goods and services within the country in question.

That is, the usual balance of payments definitions is used by both UNWTO and IMF. Referencing both sources allows us to cross-check the data. In cases where there are conflicts, the timeliest source is used.

Education travel exports and imports are excluded from international visitor spending consistent with the TSA:RMF (2008) methodology (but medical travel exports and imports are included). For many countries, education travel exports and imports data is directly available from balance of payments. Where the data are not available, we use detailed time series data of international student flows from the OECD and UNESCO and regional estimates of average annual spend per international student.

Similarly, the UNWTO visitor arrival figures (split into overnights, day and cruise visitors) are checked against local sources and used with the balance of payment series on fares and travel spending to derive average fares and travel spending per trip.

4.1.2 Forecasts

Forecasts for visitor numbers (and so for Travel & Tourism services trade) are based on a matrix of visitor demand derived from UNWTO statistics on the country of origin of foreign visitors (UNWTO Yearbook of Tourism Statistics).

In effect, a country-specific index of the potential growth in each country's tourism source markets is derived, using information on the growth in real travel spending abroad from the country's most important sources of visitors and (as weights) the typical geographical source of the country's visitors.

This allows us to take account of projections of visitor imports (i.e. residents' spending abroad) in the countries providing most of a country's visitors, when making our projections of that country's visitor exports.

This forecasting methodology is particularly valuable in taking account of developments that can be expected to have a differential impact on the propensity to travel abroad of consumers and business travellers in different countries such as exchange rate changes and changes in consumer spending patterns.

4.2 Personal consumption

4.2.1 Conceptual approach

As discussed earlier, in defining Travel & Tourism activity, we have followed the TSA: RMF (2008), and defined Travel & Tourism as “*the activities of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes not remunerated from within the place visited*”.

Our analysis is based on looking in detail at the components of consumer spending to determine whether or to what extent they are Travel & Tourism expenditures.

4.2.2 TSA countries

For countries where published TSA data are available, resident personal Travel & Tourism consumption is directly benchmarked. That is, resident personal Travel & Tourism consumption is equal to the sum of resident domestic Travel & Tourism consumption and resident outbound Travel & Tourism consumption. The actual variable benchmarked using TSA data is the resident domestic Travel & Tourism consumption element, with the outbound element obtained from published balance of payments data. By adding these two components together, resident personal Travel & Tourism consumption is computed historically.

To forecast resident personal Travel & Tourism consumption, data on Travel & Tourism shares of COICOP¹ categories have been collected and calculated for as many countries as possible, using detailed TSA breakdowns for the core Travel & Tourism spending categories. Countries for which this detailed data were obtained include: Germany, India, Japan, Philippines, Saudi Arabia, the UK and the US. Where possible, these data were used to create benchmark regional Travel & Tourism COICOP share assumptions for high, medium and low income countries. This represents a significant improvement to the methodology used prior to the 2016 annual research update. Previous editions were considerably more dependent on just US data for Travel & Tourism shares of COICOP categories.

According to the regional and income grouping of countries, detailed consumer components are then reassembled into eight sectors to produce a new set of country Travel & Tourism shares. The eight sectors are defined as follows:

- 1: Food, beverages and tobacco
- 2: Clothing and footwear
- 3: Gross rent, fuel and power
- 4: Furniture, furnishings and household equipment and operation
- 5: Medical care and health
- 6: Transport and communication
- 7: Recreational, entertainment, education and cultural services
- 8: Miscellaneous goods and services (includes lodging and restaurants)

Thus the different weightings of each category within total consumer spending, together with the different Travel & Tourism shares of these categories, determine the varying Travel & Tourism shares of personal consumption across countries.

¹ COICOP: Classification of Individual Consumption by Purpose. This is a reference classification published by the United Nations Statistics Division, which divides the purpose of individual consumption expenditures into defined categories.

Forecasts of personal consumption on Travel & Tourism are then based on first projecting the breakdown of overall private consumption, from Oxford Economics' global macroeconomic forecasting service, into the above eight categories, and then applying the actual/estimated Travel & Tourism shares to each category.

4.2.3 Other OECD countries without TSAs

For OECD countries without published TSA data available, the historic level of resident personal Travel & Tourism consumption is estimated using the "COICOP method" from the forecasting of resident personal Travel & Tourism consumption for TSA countries, as described above. That is, historic data on consumer expenditure by COICOP category is used, in combination with Travel & Tourism share assumptions (based on the regional and income classification of countries), to estimate the total level of resident personal Travel & Tourism consumption. Resident domestic Travel & Tourism consumption is equal to resident personal Travel & Tourism consumption minus resident outbound Travel & Tourism consumption from published balance of payments data.

In line with the approach used for TSA countries, the "COICOP method" is also used to forecast resident personal Travel & Tourism consumption. Oxford Economics' global macroeconomic forecasting service provides forecasts of consumer spending by COICOP category.

4.2.4 Non-OECD countries without TSAs

For non-OECD countries, we have used evidence from existing TSAs to estimate a historic relationship between personal spending per head on Travel and Tourism and overall living standards. With new TSA data becoming available over time, we re-estimated this historic relationship in 2016 to determine whether it was still valid, which we found it to be with very similar coefficient estimates and the same signs. Each year of the EIR, this relationship is re-examined with latest available TSA benchmark data.

Specifically, a strong relationship has been identified between GDP per capita and resident personal Travel & Tourism consumption, including domestic and outbound. Typically a wealthier country spends more per capita on Travel & Tourism given larger disposable income for non-discretionary consumer spending. However, a simple equation linking the two concepts implies that domestic and outbound Travel & Tourism are direct substitutes. This is generally not the case as outbound Travel & Tourism spend can be considered more of a luxury good, especially for lower income countries.

Residents' Travel & Tourism domestic consumption is estimated on a per capita basis as a function of GDP per capita and outbound spending per capita, the latter estimated from balance of payments data and UN population data. Higher outbound spending can imply a lower domestic spending share, but it can also be an indicator of a higher propensity to spend on Travel & Tourism hence the elasticity is lower than 1 in the estimated equations below.

We have also noticed that the precise relationship varies slightly according to a country's wealth. Lower income countries have a much stronger response to rising wealth with an elasticity of over 1, implying a growing share of Travel & Tourism in spending. We have therefore estimated two equations: one for lower income countries and one for higher income countries. These two equations intersect at the GDP per capita value of \$13,700 - the threshold for switching between the equations in setting the spending values. In 2016 we revisited and confirmed the continued suitability of this threshold.

The estimated equation for lower income countries is:

$$\begin{aligned} \text{rsdttpc} &= -5.9923 + 1.5453 * \text{gdppc} - 0.4871 * \text{mperttpc} \\ &(-6.807) \quad (10.866) \quad (-4.601) \end{aligned}$$

R Sq 0.8751 R Bar Sq 0.8680 Sum Sq 6.933 Std Err 0.445

The estimated equation for higher income countries is:

$$\text{rsdttpc} = -1.3494 + 0.8206 * \text{gdppc} - 0.0936 * \text{mperttpc}$$

(-1.751) (8.162) (-1.330)

R Sq 0.6947 R Bar Sq 0.6867 Sum Sq 29.698 Std Err 0.568

where:

rsdttpc = Residents' domestic Travel & Tourism spending per capita

gdppc = GDP per capita

mperttpc = Residents' outbound personal Travel & Tourism spending per capita

The numbers in parentheses are the t-statistics of the associated coefficients (equal to the estimated coefficient divided by the standard error of the estimate). The t-statistics indicate significant confidence in the values of the estimated coefficients.

These equations are used to estimate the historic level of residents' domestic Travel & Tourism spending for non-OECD countries.

For the forecast, in an improvement to the methodology in 2016, the same approach is used for non-OECD countries, as for OECD countries as outlined above. That is, forecasts of resident personal Travel & Tourism consumption are based on first projecting the breakdown of overall personal consumption, from Oxford Economics' global macroeconomic forecasting service, into the aforementioned eight categories, and then applying the estimated Travel & Tourism shares to each category to arrive at total resident personal Travel & Tourism consumption. Previously a more aggregated total consumer spend share approach was used.

4.3 Business travel

In adherence with the TSA: RMF (2008) guidelines, WTTC/Oxford Economics include both government and corporate travel expenditures. We have chosen to categorise these expenditures under the heading Business Travel.

The methodology utilises a new range of relevant data sources, including STR data regarding lodging revenues, aviation revenues from OAG, and assumptions regarding the business share of hotel and aviation expenditure which are derived from published TSAs. The methodology for estimating the corporate travel expenditures of government employees remains unchanged.

4.3.1 TSA countries

For countries where published TSA data are available, business travel is directly benchmarked. Specifically, the key objective in the TSA benchmarking exercise is to align to estimates of domestic travel & tourism spending. However, the level of detail included in a published TSA tends to vary, depending on the publishing body.

A small number of countries publish Travel & Tourism spending with specific detail in terms of spending by residents and spending by businesses. In these cases, domestic business travel spending is directly benchmarked.

For a larger number of countries, estimates are provided for total domestic Travel & Tourism spending, with no breakdown of how much of this spend is made by residents and how much by businesses. In these cases, modelled estimates of resident and business spend are used to disaggregate the total domestic business spending as published in each TSA. Domestic business travel spending, as determined by the modelled resident-business split, is then applied in the benchmarking.

4.3.2 Travel expenditures of government employees

Travel & Tourism expenditure by the government is travel-related expenditures by government employees, excluding those travelling on military assignment.

In the USA, federal government expenditure on travel and transportation of persons is collected from the Congressional Budget Office, Object Class Analysis, which is produced by the Office of Management and Budget Review and Concepts Division of the Budget Concepts Branch. State and local expenditures are taken from the Bureau of Economic Analysis.

Outside the USA, government spending on employee travel is estimated by taking the ratio of government travel to corporate travel in the US, and adjusting for relative government intensity. We base this government intensity factor on the relative size of government spending (excluding defence and social security).

We have reviewed cross-country government fiscal accounts data but typically it is not published in sufficient detail as the US.

4.3.3 Travel expenditures of corporate employees

The definition of travel expenditures by corporate employees includes expenditure during business trips both within the home country and on overseas trips. There is good data available from UNWTO and IMF Balance of Payments concerning outbound business travel expenditure by country, and this is used directly in the

analysis. For domestic business travel spending, estimates are derived using a range of data sources including STR, OAG, UNWTO, IMF and country specific TSAs.

Overall, business travel spending is divided into the following categories:

- Air travel
- Lodging
- Other (rental cars, food & beverages, other transportation, entertainment and other miscellaneous business expenditures)

These categories have been selected primarily because of available data. There are fairly good data available on lodging and air travel, but almost no data for the other categories.

The table below provides details of the sources applied for determining business travel expenditure.

Business travel component	Sources used in business travel methodology	
	Indicator	Source
Air travel	Air fare international payments	UNWTO / IMF Balance of Payments
	Domestic air passenger revenues	OAG Aviation Worldwide
	Business share of total air travel	Country-Specific TSAs /IHS Global Insight
Hotel spend	Hotel revenue	STR / UNWTO
	Business share of total hotel revenue	Country-Specific TSAs / Howarth International
	Inbound business / outbound expenditure	UNWTO / IMF Balance of Payments
Other business spend	Non-hotel share of total in-destination spend	Country specific TSAs

In most cases, the data that are used includes spending by both business and leisure visitors. To refine these estimates, ratios are derived from TSAs which specifically report domestic business travel. In total, there are 51 countries which provide data regarding total domestic travel & tourism spending, of which 11 provide a breakdown of business and leisure spending (shaded grey in the table below). It is these 11 countries which are used to derive business to total spending ratios, which are applied in the methodology.

TSA benchmark countries where business travel derived		
Australia	Italy	Slovenia
Austria	Japan	South Africa
Canada	Jordan	Spain
China	Lithuania	Sweden
Czech Republic	Malaysia	Switzerland
Denmark	Mexico	UAE
Ecuador	Netherlands	UK
Egypt	New Zealand	US
Fiji	Nicaragua	
Finland	Norway	
France	Oman	
Germany	Philippines	
Iceland	Qatar	
India	Saudi	

For air travel, data are available from UNWTO and IMF concerning outbound air travel expenditure by country. This data includes air travel expenditure by both leisure and business visitors. OAG provides data concerning air passenger revenues for both domestic and outbound flights. Since outbound air travel expenditure is known (from UNWTO and IMF), OAG data is used to derive the ratio of domestic air passenger revenue to outbound air passenger revenue, which can then be applied to the UNWTO and IMF outbound air passenger expenditure to get an estimate of total air travel spending for each country. Again, this estimate still includes expenditure by both leisure and business visitors, and a final adjustment is made to determine the proportion of total air travel revenue on domestic and outbound trips which relates to business travel only. This is achieved using data from the 11 countries that publish domestic business travel spending in a TSA. Specifically, the business share of total spending on air travel is determined for each country, and for each world region, and the world average as well, for regions which are not represented by the 11 TSA countries. These shares show that the business share of air travel spend range from 26% to 30%.

For lodging, STR revenue data are available for 123 countries covered in the EIR, and is the primary source of lodging revenue data in this methodology. For most major countries, a complete time series of data are available up to 2018. For some smaller countries, there are gaps in the STR series, which is filled using UNWTO data. Specifically, UNWTO data provides details of the number of available hotel rooms or beds in a given country, as well as room and bed occupancy rates. By combining this with STR regional level average daily room rates (for those countries that publish a complete series of data), we can fill gaps in the STR series or smaller countries, and provide estimates of lodging revenue for the countries not included in STR data sets. By definition STR data includes foreign inbound and domestic revenue, and the foreign component must be removed since it is not relevant here. UNWTO and IMF provide data regarding business travel spending by inbound visitors during their trip. This includes spending by overseas businesses in terms of both lodging and other types of expenditure. Ratios are derived from official detailed TSA analysis which includes business travel spending to determine the proportion which relates only to lodging spend. This analysis shows that between 29% and 39% of total spending by business excluding air travel is on lodging.

The other categories of business travel are usually not available outside of an I-O table. For these categories, we have used ratios derived from official detailed TSA reports, that provide a breakdown of business travel expenditure. Specifically, the ratio of business spending on other goods and services is estimated as a share of total in-destination spend (i.e. total business spend minus spending on air travel). We then take the estimated lodging spend by business and scale this up to account for other travel expenditures using the known relationship between other expenditure items and lodging according to official TSA data.

4.4 Government consumption

4.4.1 Conceptual approach

Government current expenditures on Travel & Tourism fall into two categories:

- Expenditures to provide Travel & Tourism services to the public on a **collective** basis; and
- Expenditures to provide Travel & Tourism services to the public on an **individual** basis.

A collective service is one that cannot be assigned to particular travellers. Highway expenditures are an example of such a service.

An individual service, by contrast, has an identifiable consumer. Museum subsidy expenditures are an example of an individual service.

4.4.2 TSA countries

For countries where published TSA data are available, government Travel & Tourism consumption is directly benchmarked.

4.4.3 USA analysis

The principal USA data sources are:

- Federal government expenditures - The Budget of the United States Government (1993-2018)
- State and local government expenditures - The Bureau of Census' Government Finances

In determining what portion of each agency's expenditures to include as Travel & Tourism, we have been guided by the Budget document's functional classification. Those agencies that are classified under recreational resources such as the National Park Service and Fish and Wildlife Service were determined to be 100% Travel & Tourism. Because the Federal Railroad Administration runs Amtrak, its entire budget was also counted as 100% Travel & Tourism.

For the remaining agencies, it was necessary to determine what portion of their services was related to Travel & Tourism in accordance with the TSA conceptual structure, classifications and definitions.

The principal USA Federal government agencies that have been determined to provide Travel & Tourism services, in whole or in part, to the travelling public and travel service companies include:

■ Federal Aviation Administration	89.7%
■ Federal Highway Administration	0%
■ Federal Railroad Administration	100%
■ Immigration and Naturalization Service*	0%
■ National Park Service	100%
■ US Customs Service*	0%
■ US Fish & Wildlife Service	100%

* These agencies collect a user fee that offsets their costs associated with Travel & Tourism.

At the state and local government level, those agencies that were determined to provide Travel & Tourism services to the public or travel service companies in whole or in-part were:

■ Air transportation	89.7%
■ Highways	0%
■ State Travel Offices	100%
■ Parks and recreation	36.8%
■ Libraries	5.9%
■ Sewer	0.8%
■ Sanitation	0.5%
■ Utilities	1.0%

It should be noted that all expenditures are net of offsetting collections.

4.4.4 Other OECD countries

Other countries use an estimate of government Travel & Tourism spending based on the USA and UK. We use UK rather than USA shares of government spending excluding defence and social security for European countries and define the corresponding Travel & Tourism intensity relative to the UK.

The estimate involves developing a Travel & Tourism intensity factor for each OECD country relative to the USA or UK. The intensity factor is computed as follows:

$$\text{T\&T Intensity Factor}_i = \frac{(\text{T\&T Demand} (\text{Domestic Visitor Spending} + \text{Foreign Visitor Spending}))_i / \text{GDP}_i}{\text{T\&T Demand} (\text{Domestic Visitor Spending} + \text{FVS})_{\text{US or UK}} / \text{GDP}_{\text{US or UK}}}$$

where i is each of the OECD countries.

Travel & Tourism government consumption is calculated as follows:

$$\begin{aligned} \text{Travel \& Tourism Government Consumption}_i &= \text{Non-defence, non-welfare expenditures} \\ &\quad * \text{US or UK Travel \& Tourism Government Share} \\ &\quad * \text{Intensity Factor}_i \end{aligned}$$

The assumption here is that government spending on Travel & Tourism has a positive and proportionate relationship to the total visitor spending impact on the economy.

The split between collective and individual Travel & Tourism spending is based on the split of overall government spending in each country between individual and collective spending. This is based on the US split between collective and individual Travel & Tourism spending, since in the USA, these shares turn out to be relatively similar for overall spending and Travel & Tourism spending.

4.4.5 Non-OECD countries

Not enough of the TSAs carried out for individual countries yet report enough detail on government Travel & Tourism consumption to allow us to use this to estimate a satisfactory relationship between government Travel & Tourism consumption and other basic Travel & Tourism/economic metrics.

We have therefore used results from individual country TSAs and work previously executed by WTTC and IHS Global Insight's predecessor, Wharton Economic Forecasting Associates.

Countries included in this analysis are Brazil, China, Hong Kong, India, Indonesia, Philippines, Puerto Rico, Singapore, South Africa, Thailand and Turkey. A pooled time-series, cross-section estimation method was used to include annual data from 1990 through 1997 for each of the countries, giving a total of 88 observations.

The following is the equation estimated for Travel & Tourism government consumption.

```
cgtt$ = 0.00759 * cgd + 0.12437 * expsrtt$ - 0.39305 * isldum
(4.32772) (7.25171) (2.59779)
Sum Sq 44.2960 Std Err 0.6445 LHS Mean 0.5470 Res Mean -0.0495
R Sq 0.3750 R Bar Sq 0.3632 F 3,106 21.2015 %RMSE 54.2465
```

where:

cgtt\$ = Travel & Tourism public consumption (government spending);
cgd = total public consumption;
expsrtt\$ = Travel & Tourism services exports (foreign visitor spending plus international fare receipts);
isldum = dummy variable for island economy
= 1 for Singapore, Hong Kong and Puerto Rico, 0 for all others.

The numbers in parentheses are the t-statistics of the associated coefficients (equal to the estimated coefficient divided by the standard error of the estimate). The t-statistics indicate significant confidence in the values of the estimated coefficients.

The elasticities implied by the coefficients in the equation are reasonable. The elasticity on total public spending is 0.37, implying that as the budgets of governments grow, spending on Travel & Tourism does not grow as fast. In other words, small countries spend more on Travel & Tourism relative to their total budget than do large countries. This is the experience in the OECD as well.

The elasticity implied by the coefficient on Travel & Tourism services exports, which is primarily foreign visitor spending, is 0.95, which again seems quite reasonable. Within the error of the estimate, the elasticity can be taken as 1.0. The direction of causality is not evident from a simple linear regression of this sort. One could interpret this result to say that government Travel & Tourism spending increases in proportion to foreign visitor spending and international fare receipts. On the other hand, increased government spending on Travel & Tourism may proportionally increase foreign visitor spending and international fare receipts.

5 Travel & Tourism Supply

5.1 Supply chain conceptual approach

The approach described thus far does not provide estimates of supply-side concepts such as employment and GDP.

Determining the supply-side, i.e. namely the industries that supply Travel & Tourism goods and services, requires an estimation method. The standard procedure when direct measurement is not possible is to use input-output tables.

An input-output table is a snapshot of the transactions among the industries of a country during a particular year. Each entry in the table measures the purchases (input) by one (column) industry of another (row) industry's production (output). Therefore, each column represents an annual expense statement for the column industry for the year for which the table was compiled.

Using restaurants as an example, to produce a year's worth of meals, the restaurants of a country must buy a variety of goods and services from other industries. In the input-output table, there would be a column of entries for the restaurant industry, representing these purchases: a certain amount directly from farmers; another amount from food processors; amounts from other manufacturers; and amounts from various service providers such as linen services, printers, and so forth.

The input-output table allows one to trace the restaurant expenditures as these expenditures flow through the economy from one producer to the next. The purchases the restaurant makes from a food processor, for example, generate business in food processing, which in turn generates purchases by the food processor from farmers, fuel producers, and others. Step by step these flows can be followed from one producer to the next.

Along each step of the way, industries add value to the economy. Part of this added value arises from the work of the employees in that industry and part from the industry's plant and equipment and firm's profits. Therefore, at each step in the economy, labour is used, requiring labour compensation, and plant and equipment are used, requiring 'property type' income. Labour compensation, property type income, profits and the indirect taxes imposed by government post-production make up 'value added'.

Value added is just what it says, the value added by the industry to the inputs from other industries in the production of the products it sells. The sum of value added across all producers in a country's economy is its Gross Domestic Product (GDP).

The flow of consumer expenditure through the economy thus generates employment and value added at each step in the production process. The US\$100 that a restaurant diner spends on a meal all eventually ends up in people's pockets. The input-output table allows one to trace this flow of expenditures to the pockets where it ends up – to the employers and employees in each industry.

The fundamental assumption used throughout is that the percentage of the purchases a given industry makes from each other industry in the economy does not change. In our example, the assumption is that if dining expenditures rise by 10% the next year, each of the purchases of the restaurant industry rises by the same 10%. This is the conventional approach taken in economic impact studies for all industries, but clearly in some countries undergoing large economic transformation, with specific supply chain policies or where there are large shocks such as exchange rate swings, purchase patterns can change over time.

Moreover, since the restaurant industry cannot be divided between visitors and their regular customers, the amounts that visitors contribute to the restaurant industry are assumed to produce the same proportion of the restaurant industry purchases from other industries as the industries regular customers do.

These turn out not to be very limiting assumptions, and the input-output methodology allows us to trace with fair precision the employment and GDP generated by the Travel & Tourism expenditures that take place each year. The power of this approach is that it shows the degree that other, often higher-wage and higher-productivity industries are involved in the total Travel & Tourism economy.

5.2 Travel & Tourism direct GDP

Travel & Tourism's direct contribution to GDP is defined in line with TSA: RMF (2008) as internal Travel & Tourism consumption less the domestic and imported supply chain purchases by Travel & Tourism providers needed to meet this demand:

Travel & Tourism direct GDP = Internal Travel & Tourism Consumption (i.e. visitor spending, domestic resident Travel & Tourism expenditure and government individual Travel & Tourism spending) – purchases (including imports) by Travel & Tourism providers

In order to translate internal tourism consumption into Travel & Tourism direct GDP, it is therefore necessary to derive estimates of supply chain purchases by Travel & Tourism providers. For countries that produce a TSA, it is often possible to use published data for this purpose and this is always the preferred approach. However, many countries do not produce a TSA and so it is necessary to use the input-output approach to estimate both the size of the imported and domestic supply-chain.

For the imported supply-chain, in practice this involves deriving a set of import propensity ratios from each country's input-output table, each relating to a particular component of internal tourism consumption. These ratios represent the share of each component of Travel & Tourism demand which is supported through imports by Travel & Tourism providers and can therefore be multiplied by the relevant Travel & Tourism demand category to estimate the associated level of imports.

In the first instance, import propensities are calculated directly from country-specific input-output tables, where these are available. In cases where we do not hold an input-output table for a particular country, a set of estimated equations are used, which link Travel & Tourism import propensities (from the set of countries which have detailed input-output tables) to economy-wide import propensity. The equations imply that higher economy-wide import propensity is associated with higher Travel & Tourism import propensities. The estimated equations for the import propensities relating to internal tourism consumption are as follows. The constants and coefficients in equations were estimated in the 2020 EIR using a cross-country panel of input-output data.

$$M\%DMSTDM = 0.0627 \ln(M!%) + 0.1682$$

$$M\%XVISITOR = 0.0731 \ln(M!%) + 0.1772$$

$$M\%GCTT = 0.0379 \ln(M!%) + 0.0851$$

where:

M%DMSTDM = Import propensity relating to domestic Travel & Tourism spending

M%XVISITOR = Import propensity relating to international Travel & Tourism spending

M%GCTT = Import propensity relating to government Travel & Tourism spending

M!% = Economy-wide import propensity

In a similar vein as described above for imports related to Travel & Tourism direct GDP, in order to estimate Travel & Tourism indirect GDP (discussed in more detail later), the imports associated with Travel & Tourism investment, the domestic supply chain and government collective spending must be netted-off indirect Travel & Tourism spending. Again, in the first instance, import propensities (constants and coefficients in the equations below) are calculated directly from country-specific input-output tables. In cases where we do not hold an input-output table for a particular country, a set of estimated equations are used, as described below:

$$M\%IFTT = 0.1115\ln(M!%) + 0.3086$$

$$M\%SUPPLY = 0.1203\ln(M!%) + 0.2883$$

$$M\%GCTT = 0.0379\ln(M!%) + 0.0851$$

where:

M%IFTT = Import propensity relating to Travel & Tourism investment

M%SUPPLY = Import propensity relating to the domestic supply chain

M%GCTT = Import propensity relating to government Travel & Tourism spending

M!% = Economy-wide import propensity

It should be noted that minimum and maximum constraints are applied to all import propensities, whether derived directly from a country-specific input-output table or estimated based on the equations listed above, in order to prevent outliers and extreme values from having a disproportionate impact upon results.

Once the relevant imports have been calculated and netted off the internal tourism consumption, we are left with a figure which represents the amount of internal tourism consumption which is satisfied by domestic production. However, as GDP is a measure of value added, it is also necessary to net off domestic supply chain purchases by Travel & Tourism providers (which forms part of the indirect impact). Therefore, again a ratio is derived for each country to represent the share of internal tourism consumption which is satisfied by domestic supply chain purchases. This ratio is applied to internal tourism consumption less imports to arrive at Travel & Tourism direct GDP, which represents the value added by Travel & Tourism providers. In cases where a country does not have a TSA from which this ratio can be derived, the preferred option is to calculate the ratio from the country's input-output table. Where a country does not have a TSA or an input-output table, a proxy country value is used whereby the choice of proxy country is determined by Travel & Tourism and economy-wide economic structure. Minimum and maximum constraints are again applied to this ratio prevent outliers and extreme values from having a disproportionate impact upon results.

5.3 Travel & Tourism direct employment

5.3.1 TSA countries

For TSA countries with Travel & Tourism employment estimates, productivity is taken where available and used to estimate Travel & Tourism direct employment from the Travel & Tourism direct GDP estimates. As said earlier, we use productivity rather than taking the TSA employment numbers directly since in some cases differences in other inputs such as visitor exports or implied supply chain estimates means that we do

not necessarily have exactly the same direct GDP estimates. So taking TSA Travel & Tourism employment estimates in these cases would result in inconsistent productivity.

5.3.2 Other countries

For countries without a TSA, country-specific input output tables are used in conjunction with sector employment data to derive estimates of Travel & Tourism direct productivity relative to economy-wide productivity (these estimates have been updated in the 2020 EIR making use of the expanded number of country input-output tables available). And in cases where a country does not have a TSA or an input-output table, an equation is used to provide an estimate (see below, which has been updated in the 2020 EIR). This relative productivity estimate is derived from looking at the relationship for countries where TSAs have been carried out between the level of development of the economy as measured by GDP per head and the relative productivity of Travel & Tourism. Less-developed countries tend to have higher productivity in Travel & Tourism than the economy average; high GDP per capita countries tend to have lower productivity in Travel & Tourism than the economy average. The estimated equation is:

$$R_DTTPROD = 8E-09(GDPPC^2) - 0.0012(GDPPC) + 110.82$$

where:

R_DTTPROD	=	Travel & Tourism direct productivity relative to economy-wide productivity
GDPPC	=	GDP per capita

Given that economy-wide productivity is published (or can be calculated) for almost all economies in the world, this allows the calculation of a level value for Travel & Tourism direct productivity. This is applied to our estimate of Travel & Tourism direct GDP to estimate Travel & Tourism direct employment.

6 Wider Impacts

Travel & Tourism has wider economic impacts beyond its direct contribution to GDP and employment.

In measuring the wider contribution of Travel & Tourism around the world, we also compile indirect impacts through the domestic supply chain impacts by Travel & Tourism suppliers and investment, plus Government collective Travel & Tourism spending, and induced impacts as workers in the direct and indirect Travel & Tourism industry spend their income.

6.1 Travel & Tourism investment

6.1.1 Government Travel & Tourism investment

These expenditures comprise Travel & Tourism-related public spending on 1) equipment and 2) land, buildings and infrastructure. Travel & Tourism public investments correspond to the investments made on programmes that form part of Travel & Tourism in government expenditures. The same shares attributed to Travel & Tourism in current government spending are used in public investment (see section 4.4 above).

Note that the estimates do not include government investment in multi-use infrastructure such as roads, even though this may be used extensively for Travel & Tourism as well as for other uses.

6.1.2 Private Travel & Tourism investment

Private Travel & Tourism investment includes both residential structures such as vacation houses and non-residential structures such as hotels, motels and convention centres. Investment in Travel & Tourism equipment includes such items as airplanes, passenger trains and ships, buses, taxis and rental cars.

In keeping with our philosophy of using primary source data to the greatest degree possible, we have obtained information on expenditures for transportation equipment (aircraft, car rental fleets) and hotel/motel construction on which estimates for total private investment by the Travel & Tourism sector can be based.

The specific data are as follows:

- Information on commercial passenger aircraft purchases by country are provided by Boeing and Airbus. (Combi and convertible aircraft are treated as half passenger and half cargo)
- Car rental fleet information was constructed from data obtained from the BEA and Fleet Magazine for the USA. While auto purchases are an identified line item in the OECD accounts, the data are not available. Instead, data from Fleet Magazine was used to separate out US rental car fleets (rental car company investment), to be included in our analysis, from the remainder of BEA auto fleet investment. This separation assumes that auto fleets bought by businesses are used for “normal” business activities, not Travel & Tourism (i.e. business travel purposes).
- Hotel and motel capital investment (construction) is available for the USA, Canada, and the UK. We developed hotel construction in other countries from UNWTO data on hotel rooms by country and from relative construction cost per square foot data obtained from Hanscomb/Means International. A net removal rate for decommissioned rooms in other OECD countries was developed from hard data on US net and gross number of rooms from STR. These results are calculated annually to create a time series from 1988 to date.

These capital investment purchases cover the major categories of hard Travel & Tourism private investment data available. All other important capital investment concepts must be estimated as shares of the available National Income Product Account (NIPA) investment data, usually limited to:

- Residential fixed investment
- Non-residential construction (other than hotels and motels)
- Non-residential equipment purchases (other than aircraft, cruise ships and autos)

Residential investment in vacation and holiday-use homes is obtained by applying the consumption weight for vacation homes to total residential construction for countries where residential fixed investment data are available.

For USA non-residential construction and equipment purchases, we focus just on key Travel & Tourism sectors (in other words we do not try to estimate the investment needed to meet the supply-chain requirements of Travel & Tourism) and we use estimates of the proportion of GVA/employment in these sectors accounted for by Travel & Tourism and apply this to detailed BEA data on investment by sector to quantify the remaining portion of Travel & Tourism investment for the USA.

For other OECD countries, we constructed private fixed business investment as follows:

- For construction, we began with our estimate of hotel/motel construction in each country. We then applied the ratio of USA Travel & Tourism fixed business structures investment to hotel/motel construction. This ratio is 1.8056. Our working assumption is that investment in Travel & Tourism fixed business structure parallels investment in hotel/motel construction.
- For equipment net of aircraft, we first applied the USA ratio of all private investment net of aircraft and cruise ships; then we applied the Travel & Tourism intensity factor based on overall visitor demand as described in the government consumption methodology.

6.1.3 Non-OECD investment

In a significant enhancement to earlier estimates, our assessment of Travel & Tourism investment in non-OECD countries follows a similar approach to that used for OECD countries:

- Government Travel & Tourism investment is linked to government Travel & Tourism spending using the average ratio of these from our analysis of OECD countries (0.16).
- Hotels investment is estimated from numbers of hotel rooms and the average cost of construction, including an element of smoothing changes in numbers of rooms over a three-year period and making an allowance for refurbishing a proportion of the existing stock.
- Other construction is linked to hotel investment, using the average ratio of these from our TSAs, and then splitting this into non-residential construction (0.81 times hotels investment based on our analysis of OECD countries) and residential Travel & Tourism construction (0.1 times hotels investment)
- Investment in aircraft is estimated from imports data. A small number of countries manufacture aircraft (and these countries' Travel & Tourism investment are benchmarked to their TSAs) so it is appropriate to apply aircraft import data for the majority.
- Other Travel & Tourism equipment investment is estimated as a share of total investment, linked to the share of Travel & Tourism direct GDP in the total.

6.2 Induced GDP impacts

Travel & Tourism induced GDP impacts measure the knock-on effects from the additional spending of wages in the economy generated by those employed directly in Travel & Tourism sectors and in the supply chain.

Travel & Tourism induced GDP is again estimated based on information derived from country-specific input output tables as far as possible, for which notable methodology improvements have been made in the 2020 EIR. Specifically, induced GDP multipliers are calculated from input-output tables and are applied to the sum of Travel & Tourism direct and indirect GDP, thus providing an estimate of Travel & Tourism induced GDP for each country. In cases where we do not hold an input output table for a particular country, an equation is used to provide an estimate (see below – constants and coefficients are estimated from cross-country input-output table analysis). This induced GDP multiplier estimate is derived by looking at the relationship between the level of development of the economy as measured by GDP per head, economy-wide import propensity and induced GDP multipliers for countries where we hold an input output table. The equation shows that more developed countries tend to have higher Travel & Tourism induced GDP multipliers, while countries with lower economy-wide import propensity also tend to have higher Travel & Tourism induced GDP multipliers. The estimated equation is:

$$\text{NMULT} = 0.249096 + 0.001525(\text{GDPPC}) - 0.062869(\text{M!%})$$

where:

GDPPC = GDP per capita

M!% = Economy-wide import propensity

The total contribution of Travel & Tourism to GDP is made up as follows:

Travel & Tourism direct GDP = Internal Travel & Tourism Consumption (i.e. visitor spending, domestic resident Travel & Tourism expenditure and government individual Travel & Tourism spending) – purchases (including imports) by Travel & Tourism providers

Travel & Tourism indirect GDP = Domestic supply chain + capital investment + government collective spending – imported goods meeting indirect spending

Travel & Tourism total GDP = direct Travel & Tourism GDP + indirect Travel & Tourism GDP + induced Travel & Tourism GDP

6.3 Induced employment impacts

The total contribution of Travel & Tourism to employment is made up in the equivalent way, combining direct, indirect and induced contributions to employment and taking account of differences in productivity between Travel & Tourism and the rest of the economy. Specifically, as discussed earlier with relation to Travel & Tourism direct employment, country-specific input output tables are used to derive estimates of Travel & Tourism indirect productivity and induced productivity relative to Travel & Tourism direct productivity. There are a handful of countries where indirect and induced employment are benchmarked to official figures reported in TSAs, however the vast majority of TSAs only go as far as reporting direct employment and so input output tables combined with sector employment data are the best alternative means by which to

estimate these series. And in cases where a country does not have a TSA reporting indirect and induced impacts or an input-output table, an equation is used to provide an estimate (see below, estimated from cross-country data for countries with input-output tables). This relative productivity estimate is derived from looking at the relationship for countries which have input output tables between the level of development of the economy as measured by GDP per head and the relative productivity of Travel & Tourism indirect and induced jobs compared to Travel & Tourism direct jobs. The estimated equations are:

$$R_{ITTPROD} = 0.1365\ln(GDPPC) - 0.3364$$

$$R_{NTTPROD} = 0.1501\ln(GDPPC) - 0.4491$$

where:

R_ITTPROD = Travel & Tourism indirect productivity relative to direct productivity

R_NTTPROD = Travel & Tourism induced productivity relative to direct productivity

GDPPC = GDP per capita

It should be noted that minimum and maximum constraints are also applied to the indirect and induced relative productivity estimates, whether derived directly from a country-specific input-output table or estimated based on the equations listed above, in order to prevent outliers and extreme values from having a disproportionate impact upon results.

Appendix A: Recap of Major Methodological Changes in 2020

WTTC and Oxford Economics are committed to the ongoing improvement of the Economic Impact Research Methodology. This section sets out the key methodological improvements that were made in the 2020 update.

2020 methodology improvements

In 2020, Oxford Economics undertook a major exercise to refresh and enhance the input output methodology used in the Economic Impact Research. Indeed, in the absence of TSA data for many of the smaller Travel & Tourism economies covered by the research, a core aspect of the methodology uses country-specific input-output tables to:

- Translate direct Travel & Tourism spending (demand) to GDP (domestic value added) by estimating and subtracting domestic and imported supply-chain purchases related to direct spending by Travel & Tourism providers, in order to reflect the value-added by the Travel & Tourism sector.
- Estimate Travel & Tourism's indirect GDP contribution by using the domestic supply chain purchases estimate from above and calculating the import propensity of supply-chain purchases, investment and government 'collective' spending.
- Estimate Travel & Tourism's induced GDP contribution by deriving country-specific induced GDP multipliers from the input-output tables.
- Estimate Travel & Tourism's direct employment contributions by applying relative (to total economy) productivity estimates from the input-output analysis and from analysis of relationships in countries where TSA data is available.
- Estimate Travel & Tourism's indirect and induced employment contributions by applying relative (to total economy) productivity estimates from the input-output analysis.

In 2020 and specifically to improve estimates of local supply-chain purchases, import leakages, and GDP and employment multipliers, a considerably richer dataset of cross-country input output tables not previously as widely and easily available were incorporated to the EIR. And for countries without input output tables, the larger set of available TSAs and input output tables than held previously were used to improve previous estimates. While the underlying conceptual approach remains unchanged from previous years, the use of the new input output data has resulted in the calculation of updated and more accurate historic estimates of the direct, indirect and induced GDP and employment contributions made by the Travel & Tourism sector across countries which do not publish this information through a TSA. Countries for which the EIR benchmarks to published TSA information were not affected by this methodological enhancement for variables reported in TSAs. That said, many country TSAs only go as far as reporting direct impacts so this method enhancement improved estimates of the indirect and induced contributions of TSA-benchmarked countries.

At the global level, the updated and refreshed input-output methodology verified WTTC/Oxford Economics' previous estimates of the global size of the Travel & Tourism sector, both in terms of the total GDP and total employment estimates. These estimates were very closely aligned to previous estimates, with only a marginal downward revision to Travel & Tourism's contribution to global GDP as at 2018 (from 10.4% in EIR 2019 to 10.2% in EIR 2020) and a marginal upward revision to Travel & Tourism's contribution to global employment as at 2018 (from 10.1% in EIR 2019 to 10.3% in EIR 2020).

Appendix B: Recap of Major Methodological Changes Between 2011 and 2019

WTTC and Oxford Economics are committed to the ongoing improvement of the Economic Impact Research Methodology. This section sets out the key methodological improvements that have been made over the last number of years.

2017 methodology improvements

In the 2017 update of the economic impact research, a review of the methodology to estimate business travel expenditure was undertaken. The outcome of this review was an improvement to the previous methodology where elements relied on older data. The new methodology utilises a new range of relevant data sources, including STR data regarding lodging revenues, aviation revenues from OAG, and assumptions regarding the business share of hotel and aviation expenditure which are derived from published TSAs.

2016 methodology improvements

To improve the method to estimate and forecast resident personal Travel & Tourism consumption in 2016, data on Travel & Tourism shares of COICOP categories were collected and calculated for as many countries as possible, using detailed TSA breakdowns for the core Travel & Tourism spending categories. Countries for which data were obtained include: Germany, India, Japan, Philippines, Saudi Arabia, the UK and the US. These data were used to create benchmark regional Travel & Tourism COICOP share assumptions for high, medium and low income countries. Previous editions were considerably more dependent on just US data. Forecasts of personal consumption on Travel & Tourism are now based on first projecting the breakdown of overall private consumption, from Oxford Economics' global macroeconomic forecasting service, into eight categories, and then applying the actual/estimated Travel & Tourism shares to each category. For OECD countries without published TSA data available, the historic and forecast level of resident personal Travel & Tourism consumption is now estimated using the "COICOP method" from the forecasting of resident personal Travel & Tourism consumption for TSA countries, as described above. For forecasting non-OECD countries, the same approach is used for non-OECD countries. That is, forecasts of resident personal Travel & Tourism consumption are based on first projecting the breakdown of overall personal consumption, from Oxford Economics' global macroeconomic forecasting service, into eight categories, and then applying the estimated Travel & Tourism shares to each category to arrive at total resident personal Travel & Tourism consumption. Prior to 2016, a more aggregated total consumer spend share approach was used.

2011 methodology improvements

In 2011, significant methodological enhancements were made to better align the WTTC / Oxford Economics Economic Impact Research estimates with TSA:RMF 2008 / UNWTO. A summary of the main changes and improvements are described below:

- Changed the presentation of the direct contribution estimates to make the relationship and comparability with the TSA: RMF clearer, while continuing to acknowledge that this research is a useful complement to full TSA analysis rather than a direct replacement.

- Excluded multi-use consumer durables from resident domestic Travel & Tourism spending in line with the TSA: RMF, whereas pre-2011 we produced figures both including and excluding these durables.

Consumer durable items were not traditionally included in national studies of Travel & Tourism's economic impact. But the TSA: RMF (2008) provides for the inclusion of certain durables. Specifically, it covers:

- a) Travel & Tourism 'single-purpose' durables, i.e. those used almost exclusively on trips, such as luggage or skiing equipment.
- b) Multi-purpose durables, i.e. those also used within the usual environment such as cars or cameras, if and only if they are purchased during a trip.

There is a case for including, within the TSA, a proportion of spending on multi-purpose durables based on the relative use of those durables for Travel & Tourism versus other purposes, rather than simply those bought while actually on a trip. However, to ensure consistency with other Travel & Tourism research, we previously reviewed the treatment of consumer durables in our analysis to match the treatment of durables in the TSA: RMF (2008). This typically meant some reduction in the estimates of consumer spending on Travel & Tourism.

- Aligned our investment estimates with the approach in the TSA: RMF by focusing just on key Travel & Tourism sectors rather than also including estimates of the investment needed to meet the supply-chain requirements of Travel & Tourism. At the same time, we significantly enhanced the detail used in estimating Travel & Tourism investment in non-OECD countries.
- Removed Travel & Tourism-related goods exports from the contribution estimates.
- Re-benchmarked all direct sub-components to published TSAs where comparable estimates have been produced.
- Added analysis of the induced effects of Travel & Tourism to our wider impact analysis.
- Excluded education travel exports and imports from total visitor exports and outbound spending. We improved the methodology used to estimate the adjustment for education flows in countries where education travel exports and imports are not explicitly published in balance of payments. Specifically, we used more detailed time series data of international student flows together with regional/country estimates of average annual spend per international student.

- In benchmarking visitor exports and imports to published TSAs, it is evident that many countries, including major countries such as the US and Australia, exclude education travel exports and imports from Travel & Tourism's direct contribution. These refer mainly to visitor spending associated with tertiary level students studying outside their country of residence.
- For several countries, education travel exports and imports data is available directly from the IMF balance of payment statistics. For other countries, the data is estimated using UNESCO/OECD data on numbers of inbound and outbound tertiary students, and regional estimates of average spend per mobile tertiary student. The latter is estimated from countries for which both IMF and UNESCO data is available.
- Education travel exports (receipts) are deducted from total visitor exports - this has the effect of reducing the direct contribution of Travel & Tourism.

- Education travel imports are deducted from personal expenditure on outbound travel. Expenditure on outbound travel is linked to the direct contribution of Travel & Tourism via resident domestic Travel & Tourism expenditure. Resident domestic Travel & Tourism expenditure is equal to total personal Travel & Tourism spending minus personal expenditure on outbound travel. Deducting education travel imports therefore boosts resident domestic Travel & Tourism expenditure and consequently the direct contribution of Travel & Tourism so offsets the effect for visitor exports.
- At world level the exclusion of education travel exports and imports has limited impact on the global contribution of Travel & Tourism. This is because the sum of country education travel exports and imports should equalize, and are scaled to be equal, and therefore net off against one another.
- But at country level, the impact can be and is significant, particularly for countries which are large net 'exporters' of tertiary students – e.g. countries which attract more international students than they send abroad such as the US, Australia, UK, Canada and New Zealand; and for countries which are large net 'importers' of tertiary students – e.g. countries which attract fewer international students than they send abroad such as China and India.
- For the former, the impact is to lower the direct contribution of Travel & Tourism. For the latter group of countries, the impact is the opposite.

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