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Tourism Research Australia

Tourism's Contribution to the Australian Economy, 1997–98 to 2009–10



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Executive summary

This research provides an update on tourism's indirect and total economic contribution in the Australian economy. It complements the latest estimates of tourism's direct contribution from the Australian Bureau of Statistics' Tourism Satellite Account (TSA), for the period 1997–98 to 2009–10.

Estimates in this report also reflect a number of important changes resulting from:

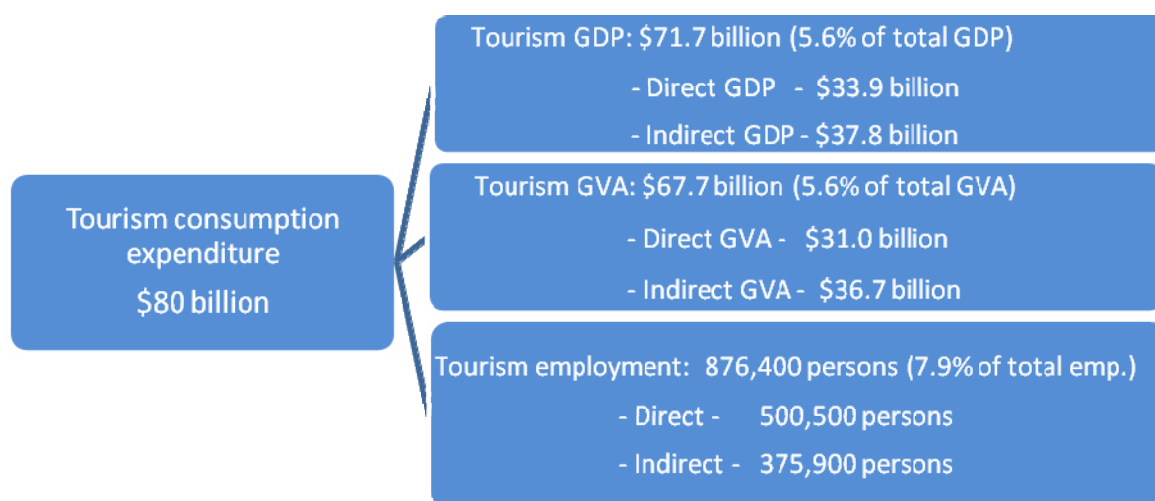
- revised benchmarking with respect to 2006-07 supply–use tables including the review of the relationships established in 2003-04 (the previous benchmark);
- the implementation of the United Nations World Tourism Organization's changes to the *Tourism Satellite Accounts: Recommended Methodological Framework (TSA: RMF 2008)*; and
- the implementation of the new *Australian and New Zealand Standard Industrial Classification 2006 (ANZSIC 2006)*.

Key findings

When combining the direct and indirect tourism components, in 2009–10 (**Figure ES1**):

- total tourism Gross Domestic Product (GDP) is worth \$72 billion representing a 5.6 per cent share of the Australian economy
- total tourism Gross Value Added (GVA) is worth \$68 billion, also representing a 5.6 per cent share of the Australian economy
- total number of persons employed in tourism is 876,400 persons, representing 7.9 per cent of Australia's labour force

Figure ES1: Tourism's contribution to the Australian economy, 2009–10



Sources: Direct contribution, ABS Cat. No.5249; Indirect contribution, TRA calculations

- The concept of indirect (and total) contribution to the Australian economy fully values tourism's supply chain. This is different to the concept of total and indirect multipliers, which reflects the economy-wide impacts on other sectors of the Australian economy.
- Using the Australian Bureau of Statistics' input-output tables, tourism's total output multiplier is valued at 1.91. This means for every dollar tourism earns directly in the Australian economy, it value adds an additional 91 cents to other parts of the economy. At 1.91, tourism's total multiplier is larger than other important industries such as mining (1.67), retail trade (1.80) and education and training (1.38).
- Using the same methodology, tourism's total employment multiplier is valued at 11.4 with an indirect employment multiplier value of 4.04.
- When applying both multipliers, a one per cent increase of tourism direct consumption expenditure of \$80 billion (\$0.8 billion) generates output outside tourism of \$0.7 billion (in nominal terms) and an increase in employment outside tourism of 2,800 persons.

Introduction

This report is the fourth in the series that measures the broader ‘indirect’ and ‘total’ value of tourism’s contribution to the Australian economy. This edition provides estimates for the indirect economic contribution of tourism between 1997–98 and 2009–10 to complement estimates of the direct contribution from the 2009–10 edition of the Australian Bureau of Statistics’ (ABS) Tourism Satellite Account (TSA), released December 2010. The two sets of estimates together present a picture of the full value of tourism to the Australian economy.

What has changed from the previous report?

This report, in addition to providing additional estimates for 2008–09 and 2009–10 from Tourism Research Australia’s (TRA) previous publication, also incorporates a number of conceptual and methodological changes adopted by the Australian Bureau of Statistics (ABS), including:

- revised benchmarking with respect to 2006-07 supply–use tables including the review of the relationships established in 2003-04 (the previous benchmark)¹
- the implementation of the United Nations World Tourism Organization’s changes to the *Tourism Satellite Accounts: Recommended Methodological Framework (TSA: RMF 2008)*
- the implementation of the new *Australian and New Zealand Standard Industrial Classification 2006 (ANZSIC 2006)*.

The combined effects of implementing the international standards, the direct tourism output, direct tourism Gross Value Added (GVA), direct tourism Gross Domestic Product (GDP) and direct tourism employment across the time series are now lower than earlier estimates (ABS 2010). As a consequence, the indirect impact of tourism has been revised downwards. For more details on these revisions and their extent, please refer to the ABS Cat. No. 5249.0, Australian National Accounts, Tourism Satellite Accounts, 2008–09.

¹ The underlying relationships between tourism and the economy are revised every three years. The benchmarking process coincides with the release of the supply-use table (current benchmarking relates to 2006-07 SU table) by the ABS.

What is the 'direct' economic contribution of tourism?

The direct economic contribution of tourism to the Australian economy, as represented by the ABS' TSA², is generated where a direct physical or economic relationship exists between the visitor and producer of the good or service.

The direct contribution is primarily focused on the immediate effect of expenditure made by visitors. For example, an increase in the number of visitors staying overnight in hotels directly affects sales in the hotel sector – the 'direct' effects are the sales and associated changes in payments for:

- wages and salaries
- taxes
- supplies and services.

Products and services produced by tourism industries are categorised by tourism characteristic and tourism connected products, which reflect the different levels of reliance on tourism.

| Tourism characteristic products | Tourism connected products |
|--|---|
| <ul style="list-style-type: none"> • Represent an important part of tourism consumption, <i>or</i> • A significant proportion of the sales are to visitors. • Must account for at least 10 per cent of total tourism consumption, <i>and/or</i> • At least 25 per cent of the total output of the product is consumed by visitors. | <ul style="list-style-type: none"> • Consumed by visitors, but are not considered as tourism characteristic products. • These products or industries are important for estimating the flow-on effect of the increase in the demand for tourism characteristic products. |

What is the 'indirect' economic contribution of tourism?

The indirect economic contribution from tourism comes from other industries not in direct contact with visitors, who are required to produce more to satisfy demand for tourism products and services from the industries who are in direct contact with visitors. Therefore, the flow-on or 'indirect' effects are the changes in supply that result from spending of the tourism industry's receipts on goods and services from other industries. For example:

- A visitor purchases a meal from a hotel,
 → the hotel purchases vegetables and meat from a food supplier

² The Tourism Satellite Account (TSA) estimates the value of tourism within the national accounting framework. A satellite account allows an expansion of the national account for selected areas of interest while maintaining the concept and structures of the core National Accounts methodology.

→ the food supplier purchases these from a farming company

→ the farming company 'purchases' labour and transport to deliver produce to market, etc.

The chain of businesses that supply goods and services to the hotel industry represent successive rounds of indirect effects, eventually linking tourism to other producing sectors of the economy.

TRA estimates the economic impact of these indirect effects to complement the direct effects that are reported in the TSA, and to provide a more complete picture of the economic contribution of tourism.

Appendix A details the Input-output methodology used in deriving the indirect contribution of tourism on output and employment.

Total contribution

This report presents the total contribution (direct and indirect) of tourism in Australia for a thirteen year period from 1997–98 to 2009–10. A number of countries, including New Zealand, use the total approach to reflect the full contribution of tourism. New Zealand's Tourism Satellite Account (2010) reported that in the year ended March 2010, tourism's full contribution was 8.8 per cent to New Zealand 's GDP; \$NZ6.5 billion (or 3.8 per cent) directly and \$NZ8.6 billion or (5.0 per cent) indirectly. Tourism also employed the full-time equivalent of 92,900 employees (or 4.9 per cent of total employment in New Zealand).

Outlining the importance of measuring the total contribution of tourism to an economy, *Statistics New Zealand (2010)* state that, "Direct value added does not measure the full impact of tourism on the New Zealand economy because it is limited to those businesses that have a direct relationship with tourists. Additional value added comes from tourism through the production of the intermediate inputs used in the production of goods and services sold to tourists, although there is no direct relationship between the producer of the intermediate inputs and the tourist. This additional value added is known as indirect value added".

Similar to the TSA (2010), estimates in this report are in nominal terms unless stated otherwise in the text, with results presented in combination with the direct contribution reported in the latest TSA. The analysis provides total contribution estimates for tourism GDP, tourism GVA (by industry) and for tourism employment.

Results and discussion

Tourism's contribution to Gross Domestic Product, Gross Value Added and employment

Gross Value Added (GVA) and Gross Domestic Product (GDP) are (related) primary measures for tracking an economy's economic performance. GDP is a measure of the total value of output in an economy, and is measured in three ways: income; expenditure and by production (or industry). GVA is part of the production series, based on the sum of all industries contribution or value add, that is the market value of output from individual industries, less the costs of goods and services (other than the consumption of fixed capital) used in the production of the output.

The production measure of GDP is the sum of individual industry value added plus net taxes (such as GST and excise duties on fuel etc) on products³

Where

$GDP(\text{production}) = GVA + \text{Net taxes on products (taxes less subsidies)}$

$GVA = \text{Compensation of employees} + \text{gross operating surplus} + \text{other taxes on production}$

Table 1: The relationship between GVA and GDP

| | Direct - as published in the Tourism Satellite Account for 2009–10 |
|-------------------|---|
| Output* | 80.0 |
| GVA | 31.0 |
| Taxes on products | 2.9 |
| GDP | 33.9 |

Sources: Direct impact is from ABS Cat. No. 5249.0

*Output is tourism consumption at basic prices⁴

According to the latest TSA (2010), the market value of output from tourism (tourism consumption at basic prices) was \$80 billion in 2009–10; an increase of 2.9 per cent over 2008–09. The direct GDP contribution of the tourism industry was \$33.9 billion in 2009–10; an increase of 3.2 per cent.

Tourism GVA, or net income generated by the industry, amounted to \$31.0 billion, up 3.2 per cent from 2008–09.

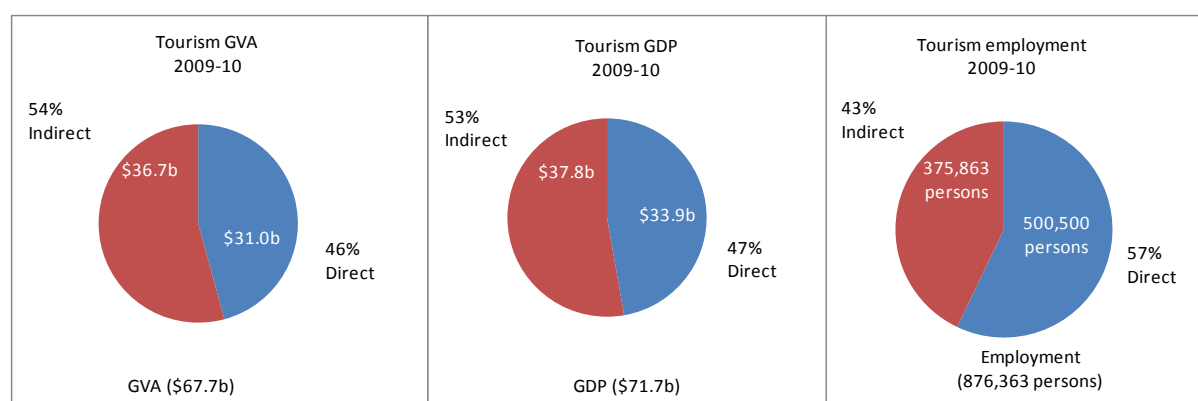
³ The gross value added (GVA) is more commonly used as a measure of economic activity at the industry level than the GDP measure, because taxes on products are not uniform across industries and therefore inclusion of taxes may distort the economic analysis. GVA figures therefore provide a direct comparison of the economic value added by different industries. GVA figures can also be compared between countries.

⁴ Tourism consumption at basic price is the visitor expenditure at purchaser prices (price paid by the visitor to the seller) not including taxes, margins and imports plus imputed value of non-market goods and services consumed by visitors.

In 2009–10, the industry indirectly contributed a further \$37.8 billion of GDP and \$36.7 billion of GVA (Figure 1 and Table 2). The indirect contribution by the tourism industry accounted for 2.9 per cent and 3.1 per cent of total GDP and GVA respectively. Combining direct and indirect contributions, tourism contributed \$71.7 billion to total GDP in 2009–10; an increase of around \$2.1 billion (or by 3.0 per cent) from 2008–09.

In 2009–10, tourism directly and indirectly contributed around 5.6 per cent to the Australian economy. Tourism’s direct measure contributed around 2.6 per cent, while another 2.9 per cent is estimated to be tourism’s indirect contribution. Tourism’s total contribution to Australia’s GDP peaked at 7.9 per cent in 2000–01, mainly due to the economic benefits of the Sydney Olympic Games and price increases associated with the introduction of the Goods and Services Tax (GST).

Figure 1: Direct and indirect share of tourism GVA, GDP and employment



Sources: Direct impact is from ABS Cat. No. 5249.0 and indirect impact from TRA model

TRA estimates that tourism directly and indirectly employed an estimated 876,400 persons in 2009–10. This represented 7.9 per cent of total employment in Australia. In contribution terms, tourism directly contributed 4.5 per cent of the Australian workforce in 2009–10, unchanged from 2008–09. The indirect contribution of tourism to total employment is estimated by TRA to be 3.4 per cent (or 375,900 persons) in 2009–10.

Similarly to the direct measures, tourism’s share of total employment (7.9 per cent) was higher than the tourism share of industry GVA (5.6 per cent) because tourism is more labour intensive⁵ than many other industries.

In 2009–10, total employment rose around 14,400 (1.7 per cent), with an increased employment of 6,900 (1.4 per cent) in directly tourism-related industries and 7,500 (2.0 per cent) in industries which

⁵ A business is labour intensive if labour accounts for the largest proportion of all inputs to the business.

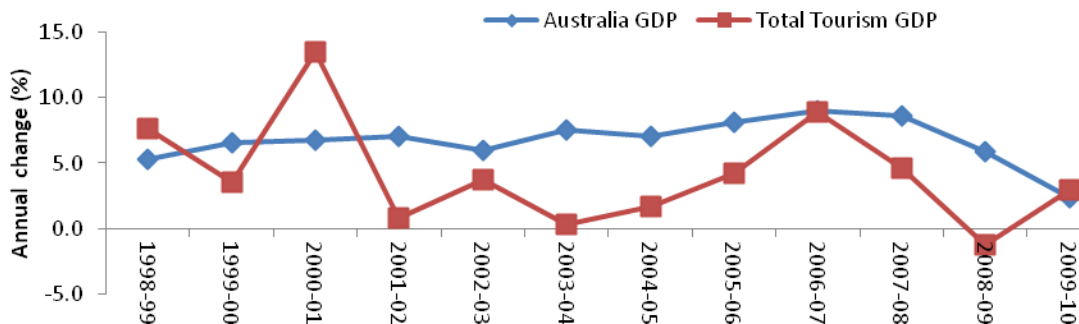
were related indirectly to the tourism. Total tourism employment increased at an average annual rate of 2.6 per cent between 1997–98 and 2009–10, much faster than the growth in direct tourism employment (of 2.2 per cent) over the same period.

In summary, in 2009–10:

- Total Tourism GDP is worth \$72 billion representing a 5.6 per cent share of the Australian economy.
- Total tourism GVA is worth \$68 billion representing a 5.6 per cent share of the Australian economy.
- Total tourism employment (persons employed) is 876,400 persons representing 7.9 per cent of Australia’s labour force.

As shown in **Figure 2**, total tourism has more year-to-year fluctuations in GDP growth as compared to the Australian GDP. In 2009–10, total tourism GDP increased by around 1.0 per cent, which reflects stronger recovery, after a more severe downturn associated with the global financial crisis in 2008–09. Over the longer period between 1997–98 and 2009–10, total tourism GDP rose at an annual average rate of 4.1 per cent, while Australian GDP increased by a stronger rate, averaging 6.7 per cent annually over the same period.

Figure 2: Annual growth in total tourism GDP and Australian GDP



Source: ABS Cat. No. 5249.0, 2009–10

Table 2: Summary, tourism's direct and indirect contribution to the Australian economy

| | 1997/98 | 1998/99 | 1999/00 | 2000/01 | 2001/02 | 2002/03 | 2003/04 | 2004/05 | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 |
|-------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Direct contribution | | | | | | | | | | | | | |
| Tourism GDP (\$m) | 18,342 | 19,710 | 20,397 | 24,213 | 25,036 | 26,259 | 26,560 | 27,244 | 28,546 | 30,906 | 32,803 | 32,844 | 33,886 |
| <i>Share of national (per cent)</i> | 3.1 | 3.2 | 3.1 | 3.4 | 3.3 | 3.3 | 3.1 | 2.9 | 2.9 | 2.8 | 2.8 | 2.6 | 2.6 |
| Tourism GVA (\$m) | 18,560 | 19,919 | 20,623 | 22,072 | 22,860 | 24,000 | 24,246 | 24,852 | 26,101 | 28,262 | 29,935 | 30,008 | 30,968 |
| <i>Share of national (per cent)</i> | 3.4 | 3.5 | 3.4 | 3.4 | 3.3 | 3.3 | 3.1 | 2.9 | 2.8 | 2.8 | 2.7 | 2.6 | 2.6 |
| Tourism employment ('000) | 415.9 | 428.0 | 435.1 | 451.4 | 459.2 | 462.9 | 462.3 | 470.5 | 475.3 | 478.1 | 491.3 | 493.6 | 500.5 |
| <i>Share of national (per cent)</i> | 4.9 | 4.9 | 4.9 | 5.0 | 5.0 | 4.9 | 4.8 | 4.8 | 4.7 | 4.6 | 4.6 | 4.5 | 4.5 |
| Indirect contribution | | | | | | | | | | | | | |
| Tourism GDP (\$m) | 25,712 | 27,710 | 28,697 | 31,494 | 31,125 | 31,997 | 31,870 | 32,155 | 33,377 | 36,522 | 37,728 | 36,807 | 37,827 |
| <i>Share of national (per cent)</i> | 4.3 | 4.4 | 4.3 | 4.4 | 4.1 | 4.0 | 3.7 | 3.5 | 3.3 | 3.3 | 3.2 | 2.9 | 2.9 |
| Tourism GVA (\$m) | 25,282 | 27,239 | 28,211 | 30,502 | 30,164 | 31,010 | 30,884 | 31,166 | 32,369 | 35,416 | 36,589 | 35,708 | 36,699 |
| <i>Share of national (per cent)</i> | 4.6 | 4.7 | 4.6 | 4.7 | 4.3 | 4.2 | 3.9 | 3.7 | 3.5 | 3.5 | 3.3 | 3.0 | 3.1 |
| Tourism employment ('000) | 226 | 244 | 253 | 305 | 304 | 312 | 315 | 324 | 336 | 364 | 377 | 368 | 376 |
| <i>Share of national (per cent)</i> | 2.7 | 2.8 | 2.8 | 3.4 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.5 | 3.5 | 3.4 | 3.4 |
| Total contribution | | | | | | | | | | | | | |
| Tourism GDP (\$m) | 44,054 | 47,420 | 49,094 | 55,707 | 56,161 | 58,256 | 58,430 | 59,399 | 61,923 | 67,428 | 70,531 | 69,651 | 71,713 |
| <i>Share of national (per cent)</i> | 7.4 | 7.6 | 7.4 | 7.9 | 7.4 | 7.2 | 6.8 | 6.4 | 6.2 | 6.2 | 5.9 | 5.5 | 5.6 |
| Tourism GVA (\$m) | 43,842 | 47,158 | 48,834 | 52,574 | 53,024 | 55,010 | 55,130 | 56,018 | 58,470 | 63,678 | 66,524 | 65,716 | 67,667 |
| <i>Share of national (per cent)</i> | 8.1 | 8.2 | 8.0 | 8.1 | 7.6 | 7.5 | 7.0 | 6.6 | 6.3 | 6.3 | 6.1 | 5.6 | 5.6 |
| Tourism employment ('000) | 642 | 672 | 688 | 757 | 763 | 775 | 777 | 794 | 812 | 842 | 868 | 862 | 876 |
| <i>Share of national (per cent)</i> | 7.5 | 7.7 | 7.7 | 8.3 | 8.3 | 8.2 | 8.1 | 8.1 | 8.0 | 8.1 | 8.1 | 7.9 | 7.9 |

Source:
indirect contribution derived by TRA.

Direct contribution from ABS Cat. No. 5249.0, 2009–10; and

Direct and indirect tourism GVA by industry

Tourism comprises many supplying industries, as defined in the TSA. Each industry's contribution to tourism varies depending upon how closely these industries are related to tourism. Some of the industries interact heavily with visitors such as *cafés, hotels and restaurants*. Other industries work in the supply line to the tourism industry such as *Manufacturing, Agriculture, Forestry and fishing* and the *Wholesale trade* industries, which interact with tourism more indirectly.

TRA estimate that tourism's indirect contribution to GVA is larger than its direct contribution. In 2009–10, of the total GVA (\$67.7 billion) contribution of the tourism industry, 47 per cent was contributed directly and 53 per cent indirectly.

Tourism has a GVA multiple of 1.185⁶, based on the ratio of tourism indirect value added and direct value added. A value of multiple greater than one indicates the industry's indirect contribution to tourism was larger than its direct contribution. In 2009–10, tourism generated \$37 billion indirectly to the Australian economy 2009–10, in addition to its direct contribution of \$31 billion.

The *Ownership of dwellings, Accommodation and food services, Retail trade, Arts and recreation, Education and training* and *Air, water and other transport services* industries had direct contact with visitors, therefore has a larger direct contribution. These industries also generated some indirect value added. For example, most of the services provided by a restaurant are by direct contact, but the services of a cook and other persons in preparing food (cutting, cleaning and setting the tables etc) are considered indirect.

Excluding ownership of dwellings, four industries collectively contributed more than three quarters of total direct GVA in 2009–10 (**Table 3**):

- *Accommodation and food services* – \$10 billion (33 per cent of total GVA);
- *Air, water and other transport services* – \$4.6 billion (15 per cent of total GVA);
- *Retail trade* – \$4.0 billion (13 per cent of total GVA); and
- *Education and training* – \$2.5 billion (8 per cent of total GVA).

A large part of total flow-on effect of visitor consumption in the tourism-related industries is felt elsewhere in other industries. This contribution is mainly represented by '*All other industries*', where around 92 per cent of total GVA contribution (\$28.5 billion) was indirect (more details are provided in the next section).

⁶ GVA multiple is the ratio of indirect GVA to direct GVA and is not a multiplier. Indirect GVA for tourism is calculated using the ratio of Industry GVA to Gross Output from input-output tables and multiplying this ratio to the indirect output relating to tourism in an industry.

Table 3: Tourism GVA by industry, 2009–10

| Industry | Direct value added | Indirect value added | Indirect value added multiple (M) | Total value added= direct value added* (1+M) |
|--|--------------------|----------------------|-----------------------------------|--|
| | \$ million | | Ratio | \$ million |
| Accommodation and food services | 10,133 | 432 | 0.043 | 10,565 |
| Rail transport | 458 | 126 | 0.275 | 584 |
| Road transport | 933 | 1,074 | 1.1513 | 2,007 |
| Motor vehicle hire and lease | 706 | 2,108 | 2.99 | 2,814 |
| Air, water and other transport | 4,629 | 2,428 | 0.525 | 7,057 |
| Travel agency and tour operator services | 1,429 | 2,743 | 1.920 | 4,172 |
| Arts and recreation services | 1,283 | 172 | 0.134 | 1,455 |
| Retail trade | 4,045 | 1,138 | 0.281 | 5,183 |
| Education and training | 2,476 | 238 | 0.096 | 2,714 |
| Ownership of dwellings | 2,578 | 0 | 0 | 2,578 |
| All other industries | 2,295 | 26,241 | 11.434 | 28,536 |
| Total tourism industry | 30,968 | 36,699 | 1.185 | 67,667 |

Sources: Direct impact is from ABS Cat. No. 5249.0 and indirect impact from TRA model

Indirect GVA in 'All other industries'

All other industries are a grouping of industries that by nature or activity are not considered tourism-related, but are nonetheless affected by rises and falls in tourism. For example, increasing visitor numbers to cafés and restaurants increases demand for flour from grain processing industries; this in turn increases grain production by the agricultural industry.

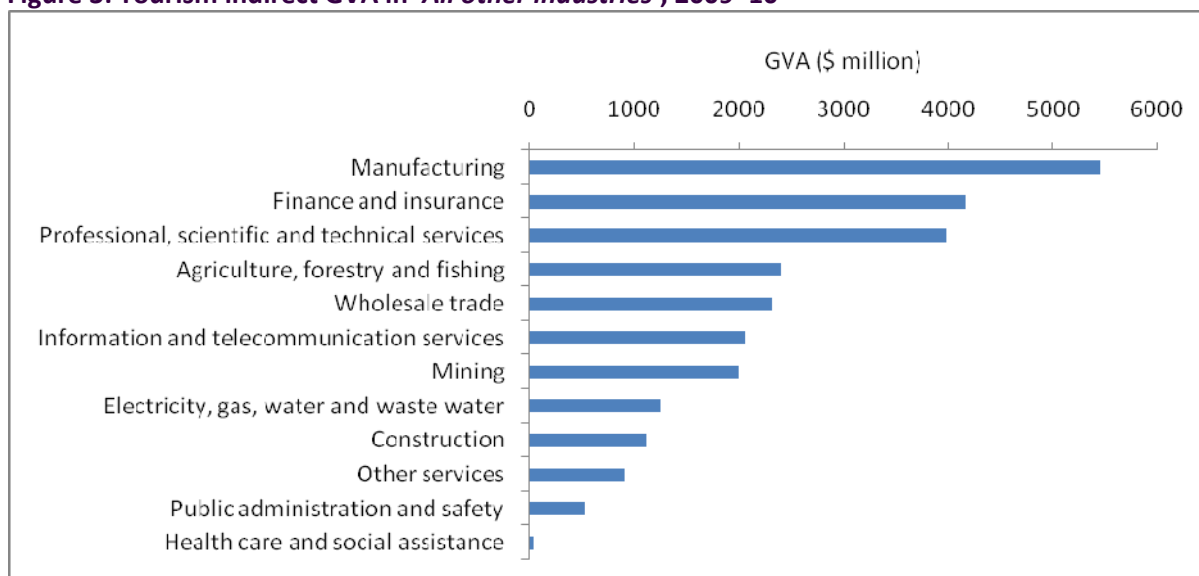
Details of the \$26 billion of indirect tourism GVA in *All other industries* in 2009–10 are presented in **Figure 3**. A little over half of total tourism GVA in this category occurred in three industries, namely:

- *Manufacturing* (\$5.5 billion)
- *Finance and insurance services*
- *Professional, scientific and technical services* (around \$4.0 billion each).

Additionally, one third of total tourism GVA was contributed by:

- *Agriculture, forestry and fishing* (around \$2.4 billion)
- *Wholesale trade* (around \$2.4 billion)
- *Information and telecommunication services* (\$2.0 billion)
- *Mining* (\$2.0 billion).

Figure 3: Tourism indirect GVA in 'All other industries', 2009–10



Source: TRA

Growth in total tourism GVA, by industry

Total tourism industry GVA grew at an annual average growth rate of 3.7 per cent between 1997–98 and 2009–10, compared to a 6.8 per cent average annual growth in the whole economy (**Figure 4**).

In Australia, three industries (*Mining, Finance and insurance services and Professional, scientific and technical services*) enjoyed double digit growth (between 10 and 12 per cent) between 1997–98 and 2009–10. These industries together constituted 26 per cent of total GVA in Australia.

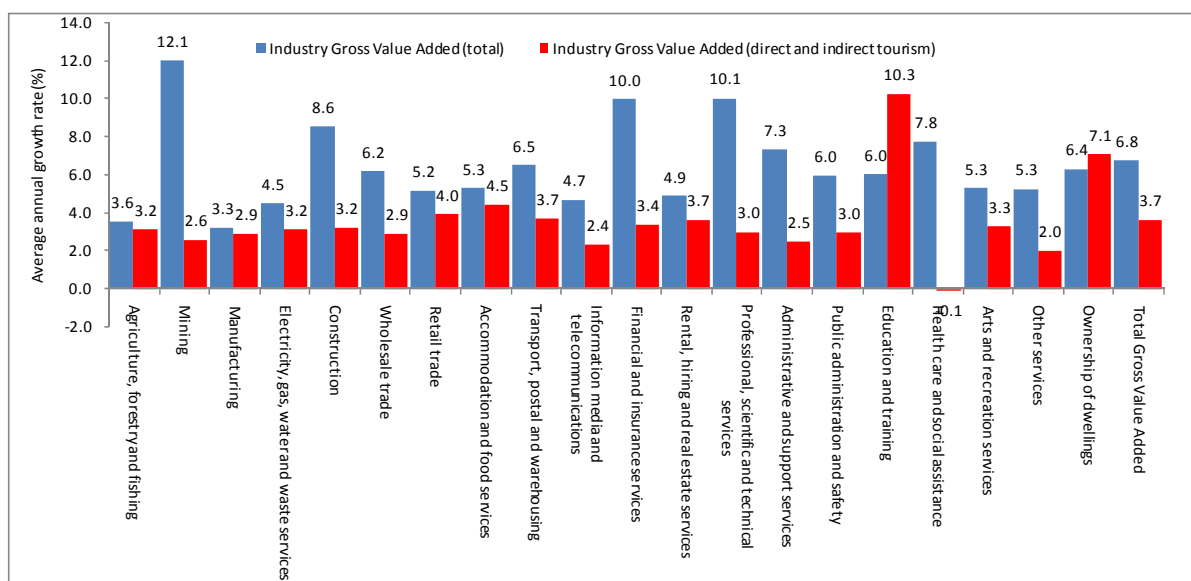
On the other hand, among tourism industries, only the *Education and training* industry achieved an annual average GVA growth of more than 10 per cent. However, this industry represents only a small 8.0 per cent share of total tourism GVA in 2009–10.

More than two thirds of total tourism industry GVA was shared among three main industries in 2009–10, namely:

- *Accommodation and food services* (33 per cent)
- *Transport, postal and warehousing* (21 per cent)
- *Retail trade* (13 per cent).

These industries achieved an average annual tourism GVA growth much lower than for the Australian economy of between 3.3 per cent and 3.6 per cent. Furthermore, for each of these industries, the growth in total ranged between 5.2 per cent and 6.5 per cent, which indicates that the non-tourism component showed much stronger growth than the tourism component of each industry.

Figure 4: Average annual growth in GVA, tourism and all industries, 1997–98 to 2009–10



Source: Derived by TRA using total GVA and direct contribution estimates from ABS Cat. No. 5249.0, 2009–10. Indirect estimates by TRA

Industry share of total tourism GVA

The industry share of total tourism GVA fluctuated in the last 13 years depending upon changes in demand and supply of tourism products (**Table 4**). For example, the share of *Accommodation and food services* industry increased from 14 per cent in 1997–98 to around 16 per cent in 2009–10 due to an increase in visitor numbers. The *Education and training* industry increased its share in tourism GVA from 1.9 per cent in 1997–98 to 4.0 per cent in 2009–10, due to an increase in short term student visitors to Australia in recent years.

Conversely, the share of *Administrative and support services* industry (mainly the *Travel agency and tour operator services*) industry declined from 7.4 per cent in 1997–98 to 6.4 per cent in 2009–10; this decline may be partially due to an increase in online facilities in travel and accommodation bookings.

The *Transport services* industry share in tourism industry GVA reached the 1997–98 levels after peaking to around 16 per cent between 2004–05 and 2007–08, indicating a fall in the prices of transport services due to increased competition between airlines.

Retail trade is one industry which was significantly affected largely by the implementation of the ‘United Nations TSA: RMF 2008’ (RMF 2008) and the ‘ANZSIC 2006 classification’.

According to the new RMF 2008 framework, only the retail margin should be included in calculations for direct tourism output and value added, while any other associated activities related to retail

(other margins) will be treated as indirect. In 2009–10 TSA estimates, the indirect retail output constituted 4.8 per cent of the total output. In terms of ANZISC 2006 effect, the *Takeaway food services* industry, which was previously a part of *Retail Trade*, has now moved to the *Accommodation and food services* industry. Thus the share of total tourism GVA has increased in the *Accommodation and food services* industry and decreased in the *Retail trade* industry.

The share of total tourism GVA in all other industries remained more or less unchanged during this period.

Table 4: Industry share in total tourism GVA (per cent)

| Tourism industries | 1997/98 | 1998/99 | 1999/00 | 2000/01 | 2001/02 | 2002/03 | 2003/04 | 2004/05 | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Agriculture, forestry and fishing | 3.8 | 3.9 | 3.9 | 4.0 | 3.9 | 3.9 | 3.8 | 3.7 | 3.7 | 3.7 | 3.6 | 3.5 | 3.5 |
| Mining | 3.3 | 3.3 | 3.3 | 3.7 | 3.4 | 3.4 | 3.1 | 3.0 | 2.9 | 3.3 | 3.1 | 3.0 | 3.0 |
| Manufacturing | 8.8 | 8.8 | 8.8 | 8.8 | 8.6 | 8.6 | 8.4 | 8.4 | 8.4 | 8.3 | 8.2 | 8.1 | 8.1 |
| Electricity, gas, water and waste services | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 |
| Construction | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 |
| Wholesale trade | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.6 | 3.6 | 3.6 | 3.6 | 3.5 | 3.5 | 3.4 | 3.4 |
| Retail trade | 7.4 | 7.2 | 7.4 | 7.4 | 7.8 | 7.9 | 7.9 | 7.9 | 7.8 | 7.7 | 7.7 | 7.8 | 7.7 |
| Accommodation and food services | 14.2 | 14.9 | 14.7 | 14.4 | 14.9 | 14.9 | 14.8 | 15.0 | 15.1 | 15.2 | 15.8 | 15.7 | 15.6 |
| Transport, postal and warehousing | 15.1 | 14.8 | 14.8 | 15.2 | 14.8 | 15.2 | 15.3 | 15.5 | 15.9 | 16.3 | 15.9 | 15.5 | 15.2 |
| Information media and telecommunications | 4.5 | 4.4 | 4.3 | 4.2 | 4.1 | 4.1 | 4.1 | 3.9 | 3.9 | 3.8 | 3.8 | 3.8 | 3.8 |
| Financial and insurance services | 6.5 | 6.4 | 6.5 | 6.4 | 6.4 | 6.3 | 6.3 | 6.3 | 6.2 | 6.2 | 6.2 | 6.2 | 6.2 |
| Rental, hiring and real estate services(a) | 6.8 | 6.8 | 6.9 | 6.7 | 6.9 | 6.9 | 6.9 | 7.2 | 7.3 | 7.2 | 7.4 | 7.8 | 8.0 |
| Professional, scientific and technical services | 6.4 | 6.3 | 6.3 | 6.3 | 6.2 | 6.2 | 6.2 | 6.1 | 6.1 | 6.0 | 6.0 | 5.9 | 5.9 |
| Administrative and support services | 7.4 | 7.2 | 7.2 | 6.8 | 6.9 | 6.8 | 6.8 | 6.7 | 6.9 | 6.6 | 6.6 | 6.5 | 6.4 |
| Public administration and safety | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 |
| Education and training | 1.9 | 2.0 | 2.2 | 2.4 | 2.8 | 2.7 | 3.1 | 3.3 | 3.2 | 3.2 | 3.4 | 3.9 | 4.0 |
| Health care and social assistance | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 1.2 | 1.1 | 1.0 | 0.9 | 0.8 | 0.9 | 0.9 | 0.9 |
| Arts and recreation services | 2.2 | 2.2 | 2.1 | 2.3 | 2.1 | 2.1 | 2.3 | 2.3 | 2.1 | 1.9 | 1.9 | 2.1 | 2.2 |
| Other services | 2.1 | 1.9 | 2.0 | 1.9 | 1.9 | 1.8 | 1.8 | 1.8 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 |
| Total Tourism GVA (direct and indirect) | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Source: Direct value added from ABS Cat. No. 5249.0, 2009–10 and indirect value added derived by TRA; (a) *Renting, hiring and real estate services* also includes *Ownership of dwellings*

Tourism employment by industry

It is difficult to apply a strict definition for tourism employment as employees in tourism-related industries generally provide services to visitors and non-visitors. To overcome this problem, the TSA estimates tourism employment by applying tourism GVA ratios from the benchmark year to ABS' labour force survey estimates for tourism-related industries (see **Appendix A** for further details).

By applying this method, TSA 2009–10 reports that tourism industry directly employed 500,500 persons in 2009–10.

Tourism's total contribution to the Australian labour force is estimated at 876,400 persons in 2009–10 with the additional 375,900 indirectly linked to the tourism value chain (**Table 5**). The indirect employment increases, with a multiple of 0.7510⁷, indicate that an additional job created directly in the tourism industry will create 0.75 jobs indirectly in the economy somewhere else to produce the additional output of tourism products consumed by the visitor.

In the *Accommodation, cafés and restaurants* industry, direct employment accounted for 95 per cent (226,000 persons) of total tourism employment in the industry in 2009–10. Similarly, direct employment accounted for 90 per cent (30,000 persons) of total tourism employment in the *Arts and recreation* industry; 89 per cent (33,000 persons) in *Education*; and 77 per cent (96,000 persons) in *Retail trade* industries. This contrasts with *All other industries*, where 91 per cent (or 245,000 persons) of total tourism-related employment was indirect (for more detail, see the next section).

Six industries collectively accounted for 69 per cent of total tourism generated employment:

- *Accommodation, cafés and restaurants* - 237,500 (27 per cent of total)
- *Retail trade* - 125,000 employees (14 per cent of total)
- *Air and water transport plus road and rail transport* - 106,500 (12 per cent of total)
- *Travel agency and tour operator services* - 68,000 (7.8 per cent of total)
- *Education and training* - 36,700 (4.2 per cent of total)
- *Arts and recreation services* - 33,700 (3.8 per cent of total).

The remaining 31 per cent (or 269,000) of total tourism employment was generated in '*All other industries*'.

⁷ Employment multiple is created by dividing direct employment by indirect, but in the model, the indirect employment is generated from the tourism indirect output using output multiplier. This indirect output is then multiplied by the ratio of total employment per unit of gross output in an industry from the input-output table.

Table 5: Direct and indirect employment in the tourism industry, 2009–10

| | Direct employment (a) | Indirect employment (b) | Tourism indirect employment multiple (b)/(a) = (c) | Total tourism employment = direct employment*(1+E) |
|--|-----------------------|-------------------------|--|--|
| | '000 | | Ratio | '000 |
| Accommodation and food services | 226 | 12 | 0.0512 | 237.5 |
| Rail transport | 4 | 1 | 0.2175 | 5.4 |
| Road transport and motor vehicle hiring | 20 | 27 | 1.3310 | 47.1 |
| Air, water and other transport | 35 | 19 | 0.5451 | 54.1 |
| Travel agency and tour operator services | 32 | 36 | 1.1313 | 68.0 |
| Arts and recreation services | 30 | 3 | 0.1119 | 33.7 |
| Retail trade | 96 | 29 | 0.3034 | 125.0 |
| Education and training | 33 | 4 | 0.1192 | 36.7 |
| All other industries | 24 | 245 | 10.1611 | 269.0 |
| Total tourism employment | 501 | 376 | 0.7510 | 876.4 |

Source: Direct employment from ABS Cat. No. 5249.0, 2009–10; and indirect employment results derived by TRA

Growth in each industry's contribution to total tourism employment has been mixed (**Figure 5** and **Table 6**). Total tourism employment added 234,000 persons (85,000 directly and 149,000 indirectly) to the Australian workforce between 1997–98 and 2009–10. *Accommodation and food services* industry added around 39,000 persons; *Retail trade* 23,000 (14,000 direct employment and 9,000 indirect employment); while *Travel agency and tour operator services* added 19,000 persons (7,000 direct and 12,000 indirect). During this period, employment in the tourism industry grew at an annual average rate of 2.6 per cent; a higher rate than the 2.2 per cent for total employment in the economy.

Figure 5: Direct and indirect employment growth in the tourism industry, change, 1997–98 to 2009–10, ('000)

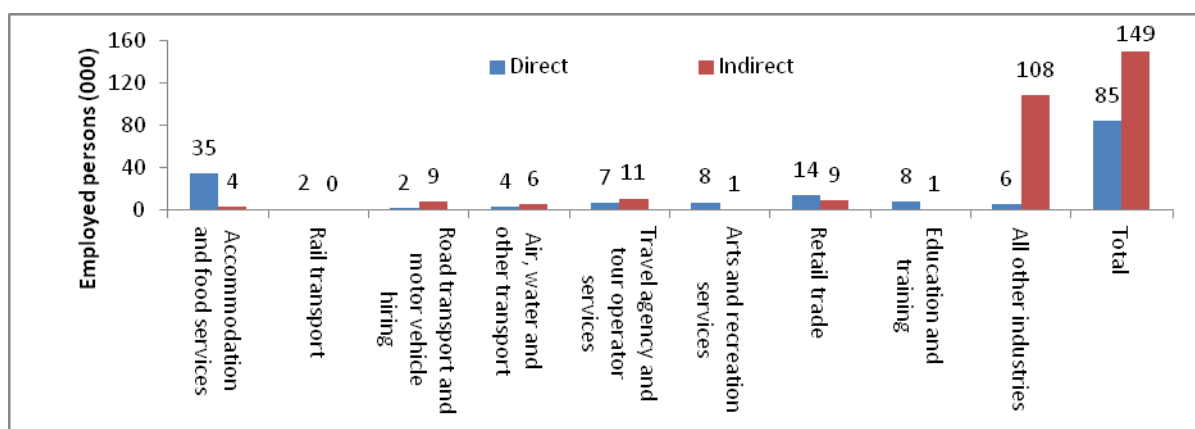


Table 6: Total (direct and indirect) employment in tourism ('000 persons)

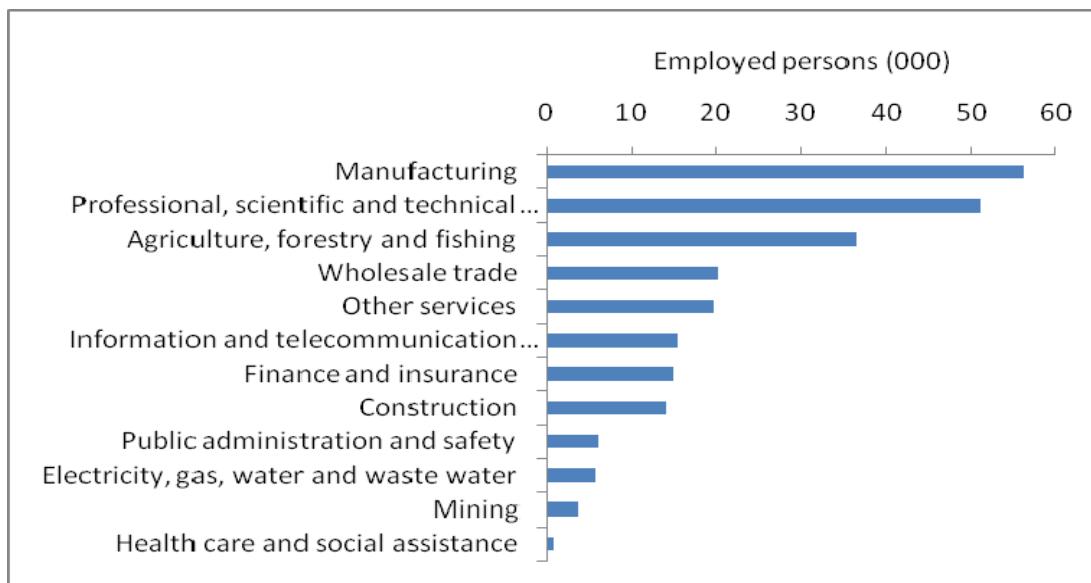
| | 1997/98 | 1998/99 | 1999/00 | 2000/01 | 2001/02 | 2002/03 | 2003/04 | 2004/05 | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 |
|--|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Accommodation and food services | 198.8 | 204.2 | 210.0 | 221.7 | 225.0 | 224.3 | 220.3 | 225.6 | 222.8 | 225.8 | 227.8 | 228.6 | 237.5 |
| Rail transport | 3.4 | 3.2 | 2.9 | 3.2 | 2.8 | 3.1 | 3.3 | 3.3 | 3.6 | 3.4 | 3.6 | 5.2 | 5.4 |
| Road transport and motor vehicle hiring | 36.6 | 38.5 | 39.0 | 40.7 | 41.5 | 41.9 | 43.7 | 42.1 | 43.2 | 46.1 | 47.9 | 48.2 | 47.1 |
| Air, water and other transport | 44.8 | 46.5 | 48.4 | 52.0 | 50.2 | 48.2 | 48.5 | 50.0 | 53.1 | 54.3 | 55.3 | 55.5 | 54.1 |
| Travel agency and tour operator services | 49.3 | 51.6 | 50.9 | 52.1 | 52.1 | 51.3 | 51.5 | 54.2 | 58.0 | 61.7 | 67.4 | 63.8 | 68.0 |
| Arts and recreation services | 25.0 | 26.4 | 26.9 | 27.5 | 29.3 | 30.4 | 31.3 | 31.9 | 33.0 | 32.1 | 33.1 | 34.3 | 33.7 |
| Retail trade | 101.9 | 106.9 | 108.6 | 110.1 | 113.1 | 119.8 | 120.3 | 122.7 | 123.1 | 124.2 | 128.6 | 126.9 | 125.0 |
| Education and training | 27.2 | 28.3 | 28.7 | 29.4 | 30.4 | 31.4 | 32.9 | 31.6 | 33.4 | 33.3 | 35.2 | 35.7 | 36.7 |
| All other industries | 155.2 | 166.9 | 172.5 | 220.3 | 219.0 | 224.9 | 225.1 | 233.0 | 241.7 | 261.2 | 269.2 | 263.6 | 269.0 |
| Total | 642.5 | 672.5 | 687.8 | 756.8 | 763.4 | 775.2 | 777.0 | 794.6 | 811.7 | 842.1 | 868.0 | 861.8 | 876.4 |

Source: Direct employment from ABS Cat. No. 5249.0, 2009–10; and indirect employment results derived by TRA

Indirect employment in 'All other industries'

More details of indirect tourism-related employment (245,000 employees) in *All other industries* in 2009–10 is provided at **Figure 6**. More than half of total tourism-related indirect employment in this category occurred in *Manufacturing* (56,000 persons); *Professional, scientific and technical services* (51,000 persons); and *Agriculture, forestry and fishing* (36,000 employees). Around 20,000 persons were employed each in *Wholesale trade* and *Other services industries*, whereas *Information and telecommunication services* and *Finance and insurance* each employed around 15,000 persons.

Figure 6: Tourism employment in 'All other industries', 2009–10



Source: TRA

Tourism multipliers

The concept of indirect (and total) contribution to the Australian economy fully values tourism's supply chain. This is different to the concept of total and indirect multipliers, which reflects the economy-wide impacts on other sectors of the Australian economy.

Care should be used in using multipliers as they are a measure of average effects, not marginal effects, and consequently do not take account of economies of scale, unused capacity or technological changes (ABS 1995).

The calculation for the indirect contribution of tourism requires output multipliers. These are sourced from ABS' input-output tables (ABS Cat. no. 5209.0.55.001). Details on the output multipliers used in this analysis are presented in **Table 8** in **Appendix B**, and are from the latest available input-output data for 2006-07, released in December 2010.

An application of these multipliers to the direct tourism consumption expenditure in Australia in 2009–10 provides tourism multiplier values for indirect output in **Appendix C**.

Using this methodology, tourism's output multiplier is valued at 1.91, which means for every dollar tourism earns directly in the Australian economy, it value adds an additional 91 cents to other parts of the economy. At 1.91, tourism's multiplier is larger than mining (1.67), retail trade (1.80) and education and training (1.38). TRA's calculation for the tourism total output multiplier is also slightly higher than calculated by Access Economics (2011) at 1.84.

Using the same methodology, tourism's total employment multiplier is valued at 11.4, with an indirect employment multiplier value of 4.04.

When applying both multipliers, a one per cent increase of tourism direct consumption expenditure of \$80 billion (\$0.8 billion) generates output outside tourism of \$0.7 billion (in nominal terms) and an increase in employment outside tourism of 2,800 persons.

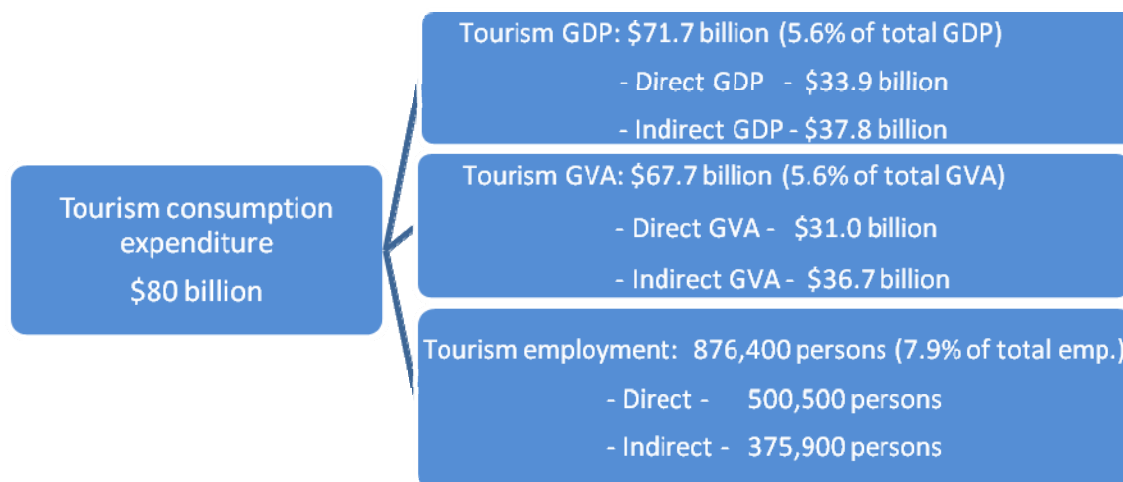
Conclusion

This report provides new estimates for the total contribution of tourism in the Australian economy from 1997–98 to 2009–10, following changes to international definitions of tourism and new National Account methodologies.

Key findings are:

- In 2009–10, tourism’s contribution to Australian GDP was \$72 billion, or 5.6 per cent of total Australian GDP (\$34 billion contributed directly and \$38 billion indirectly) (**Figure 7**). This result reflects that for every \$1.00 that tourism directly contributes to the Australian economy, it contributes an additional \$0.91 of flow-on benefits to the Australian economy.
- In 2009–10, tourism in Australia directly or indirectly employs around 876,400 persons, representing around 7.9 per cent of total Australian employment. It directly employs 500,500, while an additional 375,900 were indirectly employed along the tourism value chain.

Figure 7: Tourism’s contribution to the Australian economy, 2009–10



Source: TRA

- Between 1997–98 and 2009–10, tourism GDP (direct and indirect) rose at an average annual rate of 4.1 per cent, but lower than the 6.7 per cent annual growth in GDP for the national economy.
- Between 1997–98 and 2009–10, tourism employment increased at an average annual rate of 2.6 per cent between 1997–98 and 2009–10, slightly higher than the Australian total employment growth of 2.2 per cent. However, average annual growth in direct tourism employment has been only 1.6 per cent over this time.

- The concept of indirect (and total) contribution to the Australian economy fully values tourism's supply chain. This is different to the concept of total and indirect multipliers, which reflects the economy-wide impacts on other sectors of the Australian economy.
- Using the Australian Bureau of Statistics' Input-Output tables, tourism's total output multiplier is valued at 1.91. This means for every dollar tourism earns directly in the Australian economy, it value adds an additional 91 cents to other parts of the economy. At 1.91, tourism's total multiplier is larger than other important industries such as mining (1.67), retail trade (1.80) and education and training (1.38).
- Using this multiplier, a one per cent increase of tourism direct consumption expenditure of \$80 billion (\$0.8 billion) generates output outside tourism of \$0.7 billion (in nominal terms) and an increase in employment outside tourism of 2,800 persons.

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Appendices

Appendix A: Methodology for calculating indirect contribution

The indirect contribution model developed and implemented by TRA uses relationships derived from the latest available Input-Output (I-O) table for year 2006–07 from the ABS. The model assumes that the industry structure of the Australian economy was essentially unchanged from 1997–98 to 2009–10.

This also means that the model produces estimates based on the supply and demand relationships generated by the 2006–07 Input-Output tables. It does not take into account any year-to-year variation in supply and demand ratios. This assumption holds in terms of recently revised supply-use tables for the whole time-series based on *Australian and New Zealand Standard Industrial Classification 2006* (ANZSIC 2006).

Direct and indirect effects are measured in terms of three key economic indicators: tourism GDP, tourism GVA and tourism employment. It is difficult to directly measure employment in tourism because employees in tourism-related industries generally provide services to both visitors and non-visitors. The TSA measures direct tourism employment by applying the tourism GVA ratio in the benchmark year to the ABS Labour Force Survey estimates for tourism-related industries in subsequent years.

This method assumes that the employment generated by tourism is directly proportional to value added generated by tourism in the benchmark year. While this might not be strictly accurate, the method provides a way of apportioning total industry employment between servicing demands of visitors and non-visitors.

GVA ratios are used for generating employment estimates for the subsequent years until a new benchmark is produced using revised estimates in terms of supply-use tables, service industry surveys and other new information. Employment estimates presented in this report are based on the 2006–07 benchmark year.

The model

The Australian TSA measures the direct effects of tourism activity. This is the activity of those businesses which directly supply a product to a visitor (tourist). For example, it includes a hotel providing accommodation to a visitor, or a retailer selling a souvenir to a visitor. When a visitor buys a meal in a restaurant, the direct tourism demand is the price of the meal.

However, it does not include the indirect effects of tourism, which is of considerable interest. These are the up-stream effects of tourism demand on businesses which provide goods and services to the tourism industry. The indirect tourism demand generated from the supply of a meal to a visitor, for example, begins with the production of intermediate inputs used by the restaurant (e.g. the production of meat and vegetables used to make the meal, electricity for cooking etc). Producers of these inputs have no direct relationship with the visitor.

Indirect tourism demand is calculated through input-output analysis. This analysis provides a breakdown of the supply and demand of commodities in the Australian economy.

Input-output is based on a fundamental identity which equates supply and demand as follows:

Let, in a simple production function form, $t_{ij} = At_i + f_i$

where:

t = total outputs of industry sectors

A = inter-industry coefficients

f = final demand for outputs of the industry sectors

Solving the input-output model:

$$t = At + f$$

$$t - At = f$$

$$(I-A)t = f$$

$$t = (I-A)^{-1} f$$

where $(I-A)^{-1}$, is the Leontief inverse, or input-output inverse/multiplier.

TRA uses the following mathematical relationships to estimate indirect tourism contribution:

Indirect output

$$= [(I-A)^{-1} - I] F$$

$$\text{Indirect employment} = E [(I-A)^{-1} - I] E$$

A = a matrix (coefficient) derived from the I-O table. This table contains data on the flow of goods and services in the economy (e.g. who buys what, and who produces what)

I = Identity matrix (ones in the diagonal and zeros elsewhere)

$(I-A)$ = matrix calculated by subtracting the coefficient matrix (A) from the identity matrix (I)

$(I-A)^{-1}$ = An inverse matrix showing by what factor (row) industry sells goods and services to (column) industry because of change in final demand

F = Tourism expenditure

E = Employment

The model uses input coefficients generated by econometric equations that predict input purchases based on an economy's characteristics. Output from the model includes total industry output, employment, and value-added for all industries in the Australian economy. Total industry output is defined as the value of production by industry per year. Employment represents total wages and salaried employees for both full-time and part-time workers.

Total value added is defined as:

- all income paid to workers by employers
- self-employed income
- interests
- rents
- royalties
- dividends
- profit payments
- excise and sales taxes paid by individuals to businesses.

Appendix B: Input-output multipliers and tourism multipliers

Input-output multipliers:

A multiplier reflects the flow-on effect on output or employment, due to a unit increase in the output of a given industry which results from increased demand for a particular commodity. They are not tourism specific multipliers, but can be used to discuss the multiplier effect of increases in consumption expenditure in tourism characteristic industries.

Input-output multipliers are summary measures used for predicting the total impact on all industries, in an economy of changes in demand for the output of any one industry. The multipliers describe average effects, not marginal effects, and consequently do not take account of economies of scale, unused capacity or technological changes (ABS 1995).

Industry multipliers provide the basis for calculating tourism's indirect effects, derived from the latest available input-output data from the ABS: the 2006-07 input-output tables published in late 2010.

For example, \$1.0 million worth of tourism consumption in the *Accommodation and food services* industry will require \$2.0 million worth of goods and services to be produced throughout the economy which, in turn, generates around 16 jobs (refer **Table 7**).

Table 8 demonstrates how the tourism multiplier was constructed using the core multipliers provided in Table 7.

Table 7: Industry multipliers, based on input-output tables, 2006–07

| Industries | Output multipliers | Employment multipliers |
|---|---------------------------|-------------------------------|
| Agriculture, forestry and fishing | 1.957 | 10.96 |
| Mining | 1.664 | 3.42 |
| Meat and dairy | 2.518 | 10.51 |
| Other food | 2.301 | 9.79 |
| Beverages and tobacco | 2.136 | 7.33 |
| Textiles | 2.067 | 8.43 |
| Clothing and footwear | 1.795 | 13.48 |
| Wood | 2.131 | 10.14 |
| Printing and publishing | 1.879 | 8.77 |
| Petroleum and coal | 1.598 | 2.17 |
| Chemicals | 2.049 | 6.01 |
| Rubber and plastic | 1.928 | 7.03 |
| Non-metallic mineral | 2.132 | 6.62 |
| Basic metal | 2.151 | 3.36 |
| Fabricated metal | 2.141 | 7.14 |
| Transport equipment | 2.028 | 7.97 |
| Other machinery and equipment | 1.927 | 7.79 |
| Miscellaneous manufacturing | 2.039 | 11.83 |
| Electricity | 1.994 | 4.48 |
| Gas | 1.469 | 5.23 |
| Water supply and waste collection | 1.713 | 6.44 |
| Construction | 2.330 | 9.28 |
| Wholesale trade | 1.946 | 7.91 |
| Retail trade | 1.809 | 17.71 |
| Accommodation and food services | 2.000 | 15.84 |
| Road transport | 1.791 | 9.12 |
| Rail transport | 1.836 | 6.70 |
| Air, space, water and other transport | 2.032 | 7.46 |
| Postal and warehousing | 1.812 | 7.73 |
| Information media and telecommunications | 1.888 | 7.44 |
| Financial and insurance services | 1.479 | 4.09 |
| Rental, hiring and real estate services | 1.900 | 7.13 |
| Professional, scientific and technical services | 1.939 | 10.18 |
| Administrative support services | 1.845 | 10.62 |
| Public administration and safety | 1.689 | 9.94 |
| Education and training | 1.376 | 14.32 |

| | | |
|-----------------------------------|-------|-------|
| Health care and social assistance | 1.308 | 15.47 |
| Arts and recreation services | 1.927 | 12.46 |
| Other services | 1.798 | 13.16 |

Source: Model results derived from 2006–07 input-output tables

Table 8: Tourism industry multipliers, 2009–10

| Industries | Direct output/ consumption (\$ million) | Output multipliers* | Output/ Consumption ratio | Share weighted output/ consumption | Indirect output |
|---|---|------------------------|---------------------------------|---|--------------------|
| Agriculture, forestry and fishing | 737.2 | 1.957 | 0.009 | 0.018 | 4675 |
| Mining | 0.0 | 1.664 | 0.000 | 0.000 | 2844 |
| Meat and dairy | 1903.2 | 2.518 | 0.024 | 0.060 | 2031 |
| Other food | 1359.1 | 2.301 | 0.017 | 0.039 | 2083 |
| Beverages and tobacco | 1900.3 | 2.136 | 0.024 | 0.051 | 1038 |
| Textiles | 41.9 | 2.067 | 0.001 | 0.001 | 117 |
| Clothing and footwear | 11.4 | 1.795 | 0.000 | 0.000 | 45 |
| Wood | 107.9 | 2.131 | 0.001 | 0.003 | 259 |
| Printing and publishing | 202.6 | 1.879 | 0.003 | 0.005 | 1370 |
| Petroleum and coal | 2717.0 | 1.598 | 0.034 | 0.054 | 2569 |
| Chemicals | 270.2 | 2.049 | 0.003 | 0.007 | 888 |
| Rubber and plastic | 170.0 | 1.928 | 0.002 | 0.004 | 789 |
| Non-metallic mineral | 150.7 | 2.132 | 0.002 | 0.004 | 419 |
| Basic metal | 355.9 | 2.151 | 0.004 | 0.010 | 483 |
| Fabricated metal | 242.8 | 2.141 | 0.003 | 0.007 | 1363 |
| Transport equipment | 1014.9 | 2.028 | 0.013 | 0.026 | 1954 |
| Other machinery and equipment | 342.9 | 1.927 | 0.004 | 0.008 | 764 |
| Miscellaneous manufacturing | 33.5 | 2.039 | 0.000 | 0.001 | 125 |
| Electricity | 0.0 | 1.994 | 0.000 | 0.000 | 1329 |
| Gas | 0.0 | 1.469 | 0.000 | 0.000 | 178 |
| Water supply and waste collection | 0.0 | 1.713 | 0.000 | 0.000 | 646 |
| Construction | 0.0 | 2.330 | 0.000 | 0.000 | 3029 |
| Wholesale trade | 2392.4 | 1.946 | 0.030 | 0.058 | 4475 |
| Retail trade | 8169.5 | 1.809 | 0.102 | 0.185 | 1685 |
| Accommodation and food services | 23372.0 | 2.000 | 0.292 | 0.584 | 961 |
| Road transport | 2301.2 | 1.791 | 0.029 | 0.052 | 1935 |
| Rail transport | 882.7 | 1.836 | 0.011 | 0.020 | 178 |
| Air, space, water and other transport | 13906.8 | 2.032 | 0.174 | 0.353 | 1056 |
| Postal and warehousing | 616.2 | 1.812 | 0.008 | 0.014 | 3976 |
| Information media and telecommunications | 1311.8 | 1.888 | 0.016 | 0.031 | 3816 |
| Financial and insurance services | 100.6 | 1.479 | 0.001 | 0.002 | 5140 |
| Ownership of dwelling | 3496.1 | 1.395 | 0.044 | 0.061 | 0 |
| Rental, hiring and real estate services | 1276.2 | 1.900 | 0.016 | 0.030 | 4263 |
| Professional, scientific and technical services | 7.2 | 1.939 | 0.000 | 0.000 | 7559 |
| Administrative support services | 2646.6 | 1.845 | 0.033 | 0.061 | 5497 |
| Public administration and safety | 0.0 | 1.689 | 0.000 | 0.000 | 759 |
| Education and training | 3252.4 | 1.376 | 0.041 | 0.056 | 312 |
| Health care and social assistance | 898.0 | 1.308 | 0.011 | 0.015 | 46 |
| Arts and recreation services | 3430.3 | 1.927 | 0.043 | 0.083 | 426 |
| Other services | 349.0 | 1.798 | 0.004 | 0.008 | 1696 |
| Total | 79970.5 | | 1.000 | 1.910** | 72780.2 |

Source: Model results from 2006–07 input-output tables

*Generated from the input-output tables, see Table 7

** The total tourism multiplier (sum of share weighted output).

Appendix C: Calculations of indirect contribution

All other estimates on indirect GVA, indirect taxes on products and indirect employment are generated using the ratio of these indicators to gross output of an industry from the latest input-output table. The ratios are then multiplied to the output of an industry relating to tourism derived above using the output multiplier.

The aggregation of industry level estimates on indirect GVA, taxes on products and employment provide us with the total value of indirect GVA and employment. The derivation of these estimates is shown in **Table 9**.

Table 9: Indirect contribution - TRA calculations

| Items | Formula | Direct (a) | Indirect (b) | Total (a)+(b) | Indirect effect multiples (b)/(a) |
|--------------------------------------|---|---------------------|---|---------------|-----------------------------------|
| Indirect tourism output (\$ billion) | $=\sum (\text{Direct output}^{\text{a}} \times \text{indirect output multiplier}^{\text{b}})$ | 80.0 | $80.0 \times 0.91 = 72.8$ | 152.8 | - |
| GVA (\$ billion) | $=\sum (\text{Indirect industry output from tourism} \times \text{ratio of industry GVA to gross output}^{\text{e}}) + \text{indirect GVA from TSA}^{\text{c}}$ | 31.0 | $72.8 \times 0.44 = 32.0 + 4.6 = 36.6$ | 67.6 | $36.6/31 = 1.18$ |
| Taxes on products (\$ billion) | $=\sum (\text{Indirect industry output from tourism} \times \text{ratio of industry taxes on products to gross output}^{\text{e}}) + \text{indirect taxes on products from TSA}^{\text{d}}$ | 2.919 | $72.8 \times 0.00953 = 0.694 + 0.434 = 1.128$ | 4.047 | - |
| GDP (\$ billion) | Indirect GVA + indirect net taxes on products | $31.0 + 2.9 = 33.9$ | $36.6 + 1.128 = 37.7$ | 71.6 | - |
| Employment (000) | $\sum (\text{Indirect industry output from tourism} \times \text{ratio of industry employment on products to gross output}^{\text{e}}) + \text{indirect taxes on products from TSA}^{\text{d}}$ | 500.5 | $72.8 \times 0.00444 = 323.2 + 52.7 = 375.9$ | 876.4 | $375.9/500.5 = 0.7510$ |

*Represents multiplication

^a For individual industry, direct output and their share in total tourism output is provided in **Appendix A**

^b This is calculated from the input-output table and the indirect output multiplier is equal to total multiplier minus 1. The total tourism output multiplier is **1.910**

^c TSA also generate estimates on indirect estimates of tourism GVA and output. This represents the cost to retailers of domestically produced goods sold directly to visitors, for example, most of the services provided by a restaurant are by direct contact but the services of a cook and other persons in preparing food (cutting, cleaning and setting the tables etc) are considered indirect. This category also includes wholesale and transport margins supplied domestically.

^d Derived by TRA using relationships from TSA

^e These ratios are directly derived from input-output table (Table 5, ABS Cat. No. 5209.0.55.001)

As shown in the above table, the total tourism consumption expenditure of \$80 billion by visitors in 2009–10, generated an indirect output of \$73 billion (in nominal terms) using a total multiplier value of 1.910⁸ (indirect output multiplier will be total multiplier minus one).

An application of these multipliers to the tourism consumption expenditure share in Australia in 2007–08 provides us with tourism industry multiplier values for indirect output. While the total multiplier value provides a measure of total effect (direct and indirect) due to tourism demand, the indirect multiplier reflects the indirect creation of economic activities due to per unit increase in visitor consumption expenditure.

⁸ Details on indirect output multiplier are provided at **Appendix B**