

Deloitte Access Economics

Economic impact of the Cradle Mountain Visitor Experience Development

Cradle Coast Authority

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Glossary

ABS	Australian Bureau of Statistics
CGE	Computable General Equilibrium
DAE-RGEM	Deloitte Access Economics – Regional General Equilibrium Model
FTE	Full-time Equivalent
GDP	Gross Domestic Product
GRP	Gross Regional Product
GSP	Gross State Product
IVS	International Visitor Survey
NVS	National Visitor Survey
TRA	Tourism Research Australia
TVS	Tasmania Visitor Survey

Executive Summary

Deloitte Access Economics was commissioned by the Cradle Coast Authority to undertake an assessment of the economic impact of a proposed Cradle Mountain Development plan on the State of Tasmania.

The proposed Cradle Mountain Visitor Experience Development includes:

- [Cradle Mountain Visitor Centre](#), which acts as a gateway to the wilderness heritage areas;
- [Cable Car](#); a 25 minute ride between the Visitor Centre and Dove Lake that offers 360 degree views all year round and in all weather conditions;
- [Dove Lake Viewing Shelter](#); designed in harmony with the surrounding natural landscape; and
- [World Heritage Wilderness Village](#) developments, including guest lounge bar.

The economic impact of the development is expected to materialise through three channels:

- [increased capital expenditure](#) associated with the construction of the Cradle Mountain developments (which is expected to be positively associated with the impact);
- [increased tourism expenditure in Tasmania](#) as a result of the development attracting additional visitors and stimulating higher visitor yields (which is expected to be positively associated with the impact); and
- [increased Tasmanian taxation](#) to account for State Government funding of the Cable Car and Village developments (which is expected to be negatively associated with the impact).

Given the directional differences in the channels of influence and likely interactions with the rest of the State economy, Deloitte Access Economics has captured the overall effects of the Development on economic activity, or gross state product (GSP), through the Deloitte Access Economics – Regional General Equilibrium Model (DAE-RGEM). Models like DAE-RGEM are the preferred analytical tools for exercises of this nature and account for both the flow-on impacts to related up- and down-stream sectors and the resource constraints that characterise the economy.

Scenarios and specifications

As is not uncommon during the planning stage, there are a number of uncertainties in relation to the Development's capital expenditure and funding and its impacts on additional tourism at the State level. For instance, while BDA Marketing has surveyed the impact of the development on visitor intentions to Cradle Mountain, it does not investigate how additional nights in Cradle Mountain might affect overall stay in the rest of Tasmania. If visitors are spending fewer nights in the rest of Tasmania in order to spend more nights in Cradle Mountain, the additional tourism expenditure to Tasmania may be lower than the additional expenditure to Cradle Mountain.

To account for some of the likely differences and uncertainties that characterise the Development, two funding scenarios have been analysed. The scenarios differ with respect to the amount of capital expenditure and degree of public funding required for the Cable Car construction.

- Under [Scenario 1](#), the Cable Car is expected to cost \$60 million and will be 100% funded by public funds, with equal contribution from Federal and State Governments.
- Under [Scenario 2](#), the Cable Car is expected to cost \$70 million and will be 80% funded by public funds, with the remaining 20% to be privately-funded.

The capital expenditure on the village is expected to be equal and funded fully by the public sector in both scenarios. The scenarios also do not differ in the amount of visitation that is attracted to the Cradle Mountain region.

For each of the two funding scenarios, the modelling also includes three specifications on the degree of additional activity that is likely to occur at the Tasmania level as a result of the Development. These specifications have been used to highlight uncertainty over key parameters – including the additional nights likely to occur in Tasmania – as well as to explicitly analyse components that are conventionally excluded from economic assessments of developments – adjacent developments and retained expenditure from intrastate visitors.

- In the [high attribution specification](#), it is expected that a \$62 million, 206 room, privately funded hotel will be built to support additional visitation to Cradle Mountain. It has also been assumed that there is no displacement of nights from the rest of Tasmania, with each additional night in Cradle Mountain translating to an additional night for Tasmania (100% additional nights). Further, the additional expenditure of interstate and international visitors, and retained expenditure of intrastate visitors have been included.
- in the [central attribution specification](#), the hotel development has been excluded given the uncertainty around its construction and whether it can be counted as a part of the Development. Similarly, the retained expenditure of intrastate visitors, who travel within Tasmania instead of interstate, has been excluded. It has also been assumed that the international and interstate additional visitation to Cradle Mountain will displace 50% of those nights from the rest of Tasmania (i.e. each additional night in Cradle Mountain translates to 0.5 additional nights for Tasmania, and 0.5 nights fewer for the rest of Tasmania).
- in the [low attribution specification](#), the hotel development, and the retained expenditure of intrastate visitors have been excluded. All additional nights to Cradle Mountain come at the expense of visitor nights in the rest of Tasmania and there are no net additional nights in Tasmania.

The capital expenditure and tourism expenditure profiles of the six modelled scenarios are summarised in Table i.

Table i: Summary of scenarios and specifications

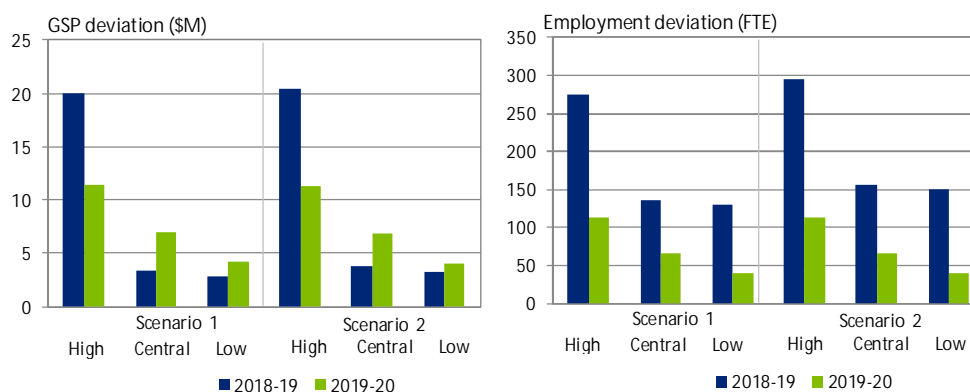
Funding scenario	Scenario 1			Scenario 2		
Specification	High	Central	Low	High	Central	Low
Capital expenditure (\$M)	163	101	101	173	111	111
Cable Car	60	60	60	70	70	70
Other developments	41	41	41	41	41	41
Hotel	62	NA	NA	62	NA	NA
Gov't funding for Cable Car	100%	100%	100%	80%	80%	80%
Additional nights in Tasmania (%)	100%	50%	0%	100%	50%	0%
Tourism expenditure (2020 - \$M)	29	18	11	29	18	11
Interstate	20	15	10	20	15	10
International	3	3	2	3	3	2
Intrastate	5	NA	NA	5	NA	NA

Source: Deloitte Access Economics (2016)

Results

The additional GSP and employment associated with each of the development scenarios is given in Chart i over two years: (i) 2018-19 during the height of construction; and (ii) 2019-20 as the Development becomes fully operational.

Chart i: GSP and employment deviation in select years under all scenarios



Source: Deloitte Access Economics (2016)

In 2018-19, GSP is approximately \$3 million (0.01%) higher under Scenarios 1 and 2 (**central** and **low** specifications). 135 full-time equivalent (FTE) jobs are created under **Scenario 1**, and 156 FTE jobs in **Scenario 2**, with the difference driven by the higher investment levels for the Cable Car under Scenario 2. When the hotel development is included in the **high** specification, GSP is higher by \$20 million (0.07%) compared to the baseline scenario.

Once the Cable Car becomes operational in 2019-20, GSP is expected to be approximately \$7 million higher under the **central** specification under scenarios 1 and 2. Over the same period, 67 FTE new jobs are supported compared to the baseline scenario.

The GSP increase ranges from \$4 million in the **low** specification where visitors fully displace their additional nights to Cradle Mountain from elsewhere in Tasmania, to \$12

million in the **high** specification, where no displacement occurs, and some intrastate visitors are expected to replace interstate trips as a result of the development. The FTE jobs created range from 40 to 113 FTE jobs.

Conclusions

As a result of the proposed development and the estimated additional investment and tourism expenditure in Tasmania, there is expected to be overall positive GSP and employment impacts over the forecast period.

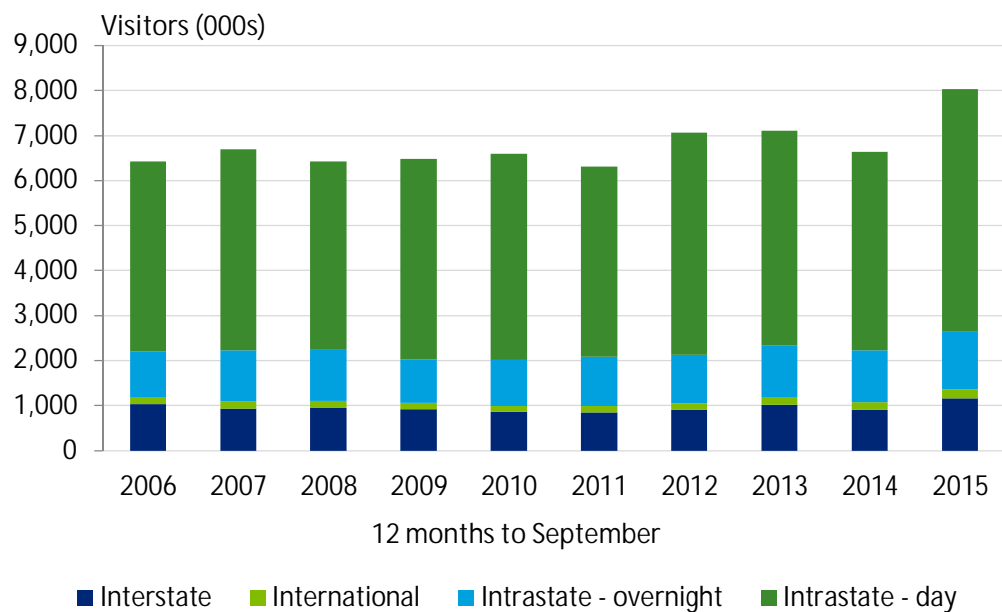
However, measurable economic impacts are just one suite of metrics in considering the merits of development projects. There are also a variety of potential social, cultural and environment impacts that have not been quantified – and in many cases cannot be reliably measured – including the costs of the additional resources required to generate the economic activity, and the potential impacts on the natural environment. A final determination regarding the project should take these factors into account.

Deloitte Access Economics

1 Background

In the 12 months to September 2015, over 7.8 million visitors travelled to or within Tasmania, either for leisure, to visit friends and relatives (VFR), for business or for education. This represents the peak number of visitors to Tasmania, with the state tourism sector experiencing recent strong growth buoyed by a return of the Australian dollar to historical averages. In particular, over the five years to 2015, the sector has experienced an average growth of 4.0% per annum. While the majority of visitors, 83% or 6.7 million are from intrastate (including both overnight and day trippers), 1.1 million are from interstate (14%) and 0.2 million (2%) are from overseas. The breakdown of visitors to Tasmania by origin over the 2006 to 2015 period is shown in Chart 1.1.

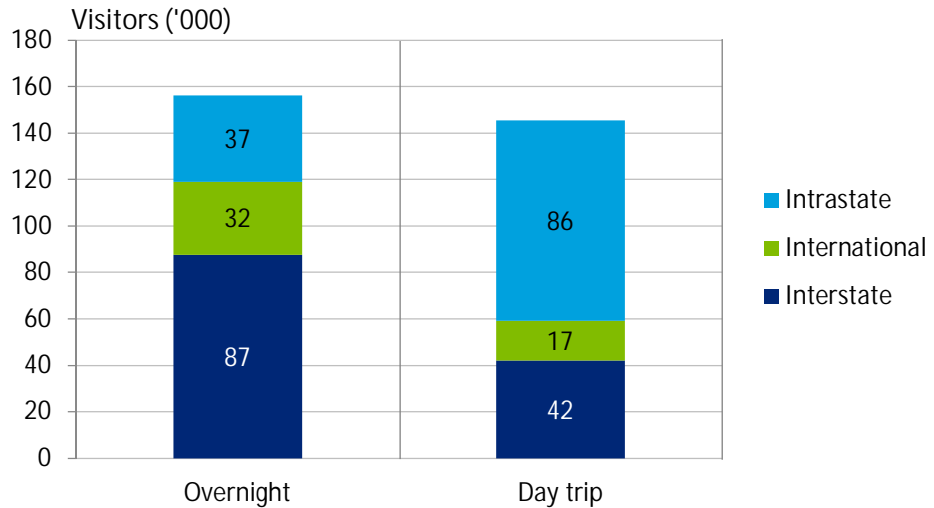
Chart 1.1: Visitors to Tasmania by origin, 2006-15



Source: TRA (2015)

Cradle Mountain is a primary gateway to the Tasmanian Wilderness World Heritage Area. BDA Marketing estimates that approximately 166,000 overnight and 158,000 day trip visitors were attracted to the region in 2015 (Chart 1.2). Based on visitors to Tasmania and Cradle Mountain, it is implied that approximately 13%, 25% and 2% of all interstate, international, and intrastate visitors in Tasmania visited the Cradle Mountain region in 2015. While day trips were relatively more popular with intrastate visitors, interstate and international visitors were more likely to stay overnight.

Chart 1.2: Visitors to Cradle Mountain by origin and type, 2015



Source: BDA (2016); Deloitte Access Economics (2016)

To support precinct revitalisation in Cradle Mountain, the following Cradle Mountain Visitor Experience Development has been proposed:

- [Cradle Mountain Visitor Centre](#), which acts as a gateway to the wilderness heritage areas;
- [Cable Car](#); a 25 minute ride between the Visitor Centre and Dove Lake that offers 360 degree views all year round and in all weather conditions;
- [Dove Lake Viewing Shelter](#); designed in harmony with the surrounding natural landscape, and
- [World Heritage Wilderness Village](#) developments, including guest lounge bar.

It is hoped that the Development will attract new visitors, particularly during shoulder seasons. The modelled increase in regional visitation as a result of the proposed Development could also generate private sector investment in [new accommodation options](#) that will meet the additional overnight demand, and the requirements of changing demographics of visitors.

2 Data and scenarios

This section outlines the available data and the underlying assumptions that will drive the scenarios to be modelled.

2.1 Data and assumptions

Data from the Cradle Coast Authority, BDA Marketing, Tourism Tasmania and Tourism Research Australia (TRA) have been used to characterise the construction of the Development and its likely effects on additional tourism demand.

2.1.1 Capital expenditure

To support the Development, it is expected that [between \\$101 million to \\$111 million in public and private funded capital expenditure will be spent between 2016-17 and 2018-19](#). The Cradle Coast Authority has provided estimates of the breakdown of capital expenditure on the proposed Development.

The Cable Car is expected to cost between \$60 million to \$70 million, with construction taking 1.5 years, and to be completed by the end of financial year 2018-19. The public sector is expected to fund between 80% to 100% of the investment, depending on whether a private partnership can be negotiated. There is expected to be equal contributions from the State and Federal Governments.

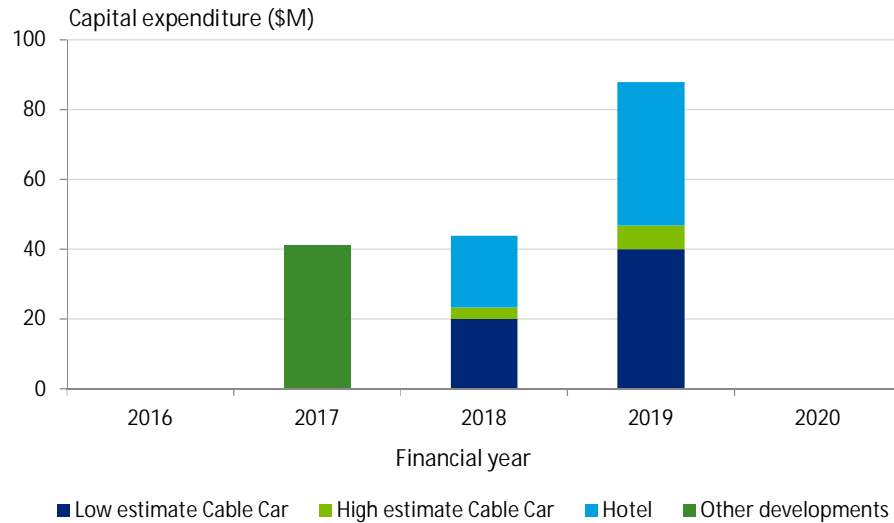
The remaining developments, including for the Cradle Mountain Visitor Centre, Dove Lake Viewing Shelter, and World Heritage Wilderness Village, are estimated to cost \$41 million. Construction is expected to take place in 2016-17 and is assumed, for the purposes of the modelling undertaken here, to be fully publicly funded.

In addition to these proposed developments, data from BDA Marketing shows that 206 hotel rooms would be required by 2020 to accommodate the additional visitors to Cradle Mountain. Assuming an average construction cost of \$300,000 per hotel room, [an additional \\$62 million of private-funded capital expenditure may occur](#).

The capital cost per room figure is consistent with estimates for five star hotels in Adelaide and Perth (Rawlinsons, 2015), but would likely reflect costs for a four star hotel in the Cradle Mountain region due to higher construction costs in the remote area. Construction of the hotel rooms is assumed to occur concurrently to the Cable Car construction and will be completed at the same time.

The profile of the possible capital expenditure required for the Cradle Mountain Development and hotel from 2016-17 to 2019-20 is given below in Chart 2.1.

Chart 2.1: Cradle Mountain Development capital expenditure profile, FY2016-20



Source: Cradle Coast Authority (2016); Deloitte Access Economics (2016)

2.1.2 Additional tourism revenue to Cradle Mountain

To estimate the additional tourism expenditure by visitors in the Cradle Mountain region, implied data from the BDA Marketing Cradle Mountain Demand Potential Assessment has been used to inform the likely impact of the Development on the profiles of potential visitors to Cradle Mountain. In particular, BDA Marketing forecasts include estimations of:

- the proportion of visitors to Tasmania that are likely to visit Cradle Mountain before and after the Development;
- the average nights per trip to Cradle Mountain; and
- the average daily expenditure per visitor in Cradle Mountain.

These estimates have been developed through a survey of 211 Tasmanian residents and 644 interstate residents, and a comparison of their intentions 'pre stimulus' (current Cradle Mountain offerings) and post 'tomorrow' stimulus based on the proposed developments.

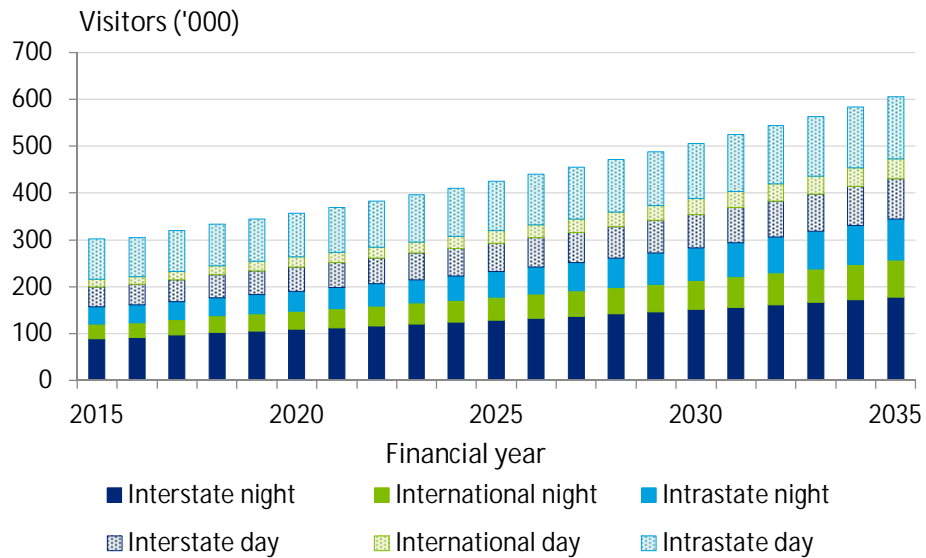
Visitor numbers

Following a similar methodology as set out in BDA Marketing estimates, it is expected that without the Development Tasmania will keep its current share of the Australian tourism market over time, with a constant proportion of visitors visiting Cradle Mountain. Deloitte Access Economics assumes the Australian tourism market is expected to follow trend growth rates in each of the market segments (interstate, international, intrastate) over the past five years.

Without the Development, there is projected to be approximately 357,000 visitors to Cradle Mountain in 2019-20, with approximately 190,000 visitors staying overnight and 167,000 visitors taking day trips. This assumes the proportion of total visitors to Tasmania who visit Cradle Mountain will remain constant through the forecast period. By 2035, total visitor numbers are expected to grow to 605,000.

The time series of visitors to Cradle Mountain without the Development, by origin and type of visitor, is shown in Chart 2.2.

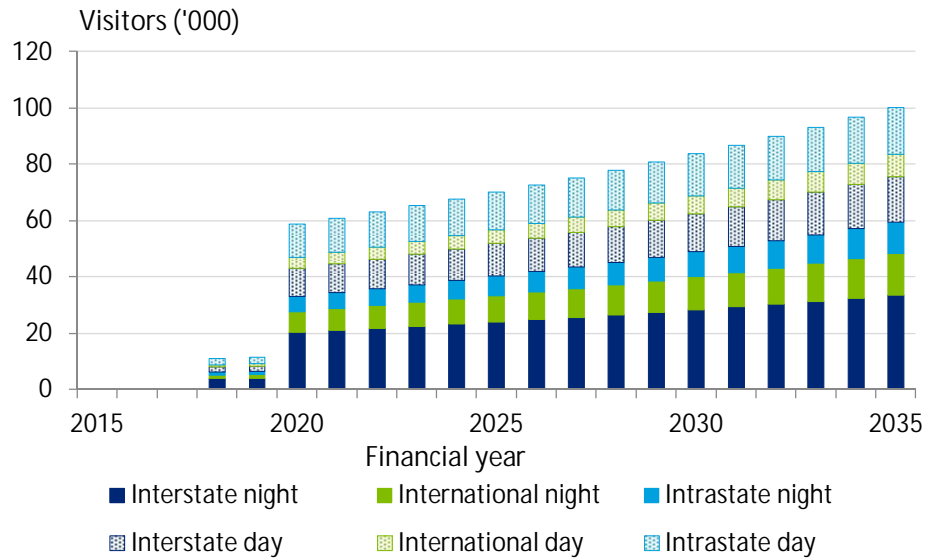
Chart 2.2: Cradle Mountain projected baseline visitor numbers, 2015-35



Source: BDA Marketing (2016); Deloitte Access Economics (2016)

As a result of the Development, it is expected that **an additional 59,000 trips will be made to Cradle Mountain** in 2019-20 following the completion of the Cable Car. Of these, 41,000 trips will be made by interstate or international visitors. Interstate overnight visitors are expected to be the single largest growth segment in absolute terms, accounting for an additional 22,000 trips. Assuming the improvement in visitation rates are maintained through the remaining modelling period, an additional 100,000 trips to Cradle Mountain will be made in 2034-35 (Chart 2.3).

Chart 2.3: Additional Cradle Mountain visitor numbers, 2015-35



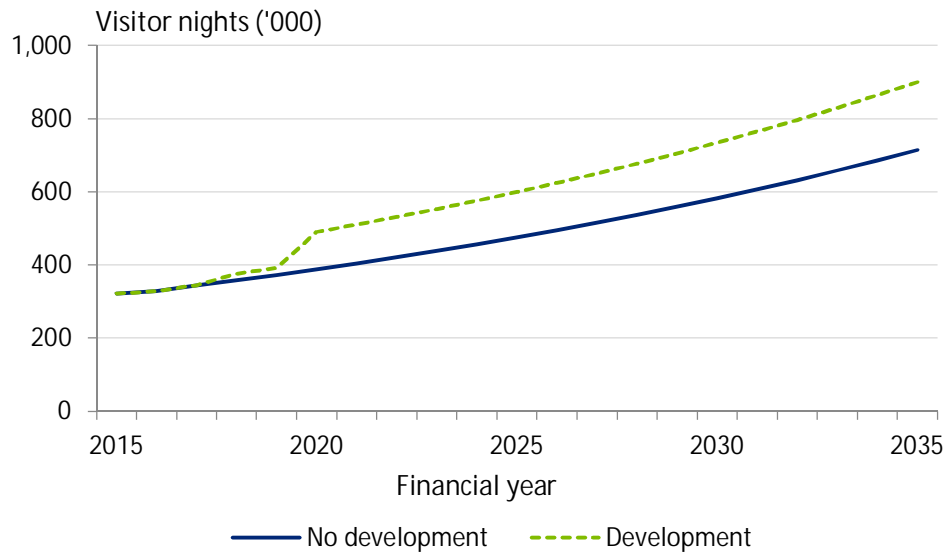
Source: BDA Marketing (2016); Deloitte Access Economics (2016)

Visitor nights

From BDA Marketing estimations of overnight visitors and overall nights in Cradle Mountain in the 'trend outlook', it is implied that the average overnight interstate/international and intrastate visitor to Cradle Mountain stayed for 1.9 and 2.8 nights respectively. Consequently, total visitor nights are expected to reach 389,000 in 2019-20 without the Development. This assumes no changes in consumer preferences for the length of stay over the forecast period. The BDA Marketing survey found the Development is also likely to increase the length of stay for all existing and new visitors. In particular, BDA Marketing estimate that following the Development, the average interstate/international visitor is likely to increase their stay to 2.0 nights and the average intrastate visitor to 3.0 nights.

The estimated total visitor nights in the Cradle Mountain region under the baseline and development scenarios is given in Chart 2.4. [By 2019-20 with the Development construction fully completed](#), there is expected to be an additional 102,000 visitor nights (58,000 interstate, 21,000 international, and 23,000 intrastate). By 2035, this is expected to increase to 185,000 visitor nights.

Chart 2.4: Cradle Mountain visitor nights, 2015-35



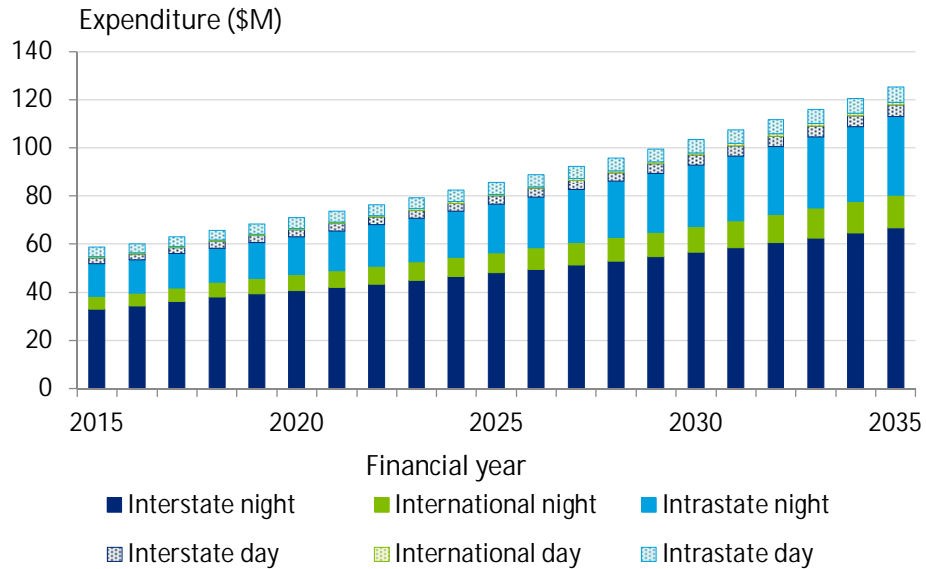
Source: BDA Marketing (2016); Deloitte Access Economics (2016)

Visitor expenditure

The BDA Marketing 'trend outlook' implies the average overnight interstate/international visitor to the Cradle Mountain region spends \$173 per day and the average day trip interstate/international visitor to the Cradle Mountain region spends \$47 per trip. Given daily expenditure by international visitors in Tasmania is approximately 46% of their interstate counterparts (IVS, 2015; TVS, 2015), Deloitte Access Economics estimates the average interstate overnight and day trip visitor spends \$201 per night and \$56 per trip, compared to \$92 per night and \$26 per trip for international visitors. BDA Marketing also finds that intrastate visitors spend an average of \$139 per night and \$47 per trip respectively. BDA estimates are largely consistent with the broader spending levels in Tasmania, and other similar tourism destinations, such as the Western Wilderness (Tourism Research Australia, 2015).

Assuming no growth in tourism expenditure (in real 2015-16 dollars), total expenditure by visitors in Cradle Mountain is expected to reach \$71 million without the Development in 2019-20. Although the split between day and overnight visitor numbers was fairly even (53% versus 47%), 89% of total expenditure can be attributed to overnight visitors as they spend more per day and stay longer in the region.

Chart 2.5: Cradle Mountain projected baseline visitor expenditure, 2015-35

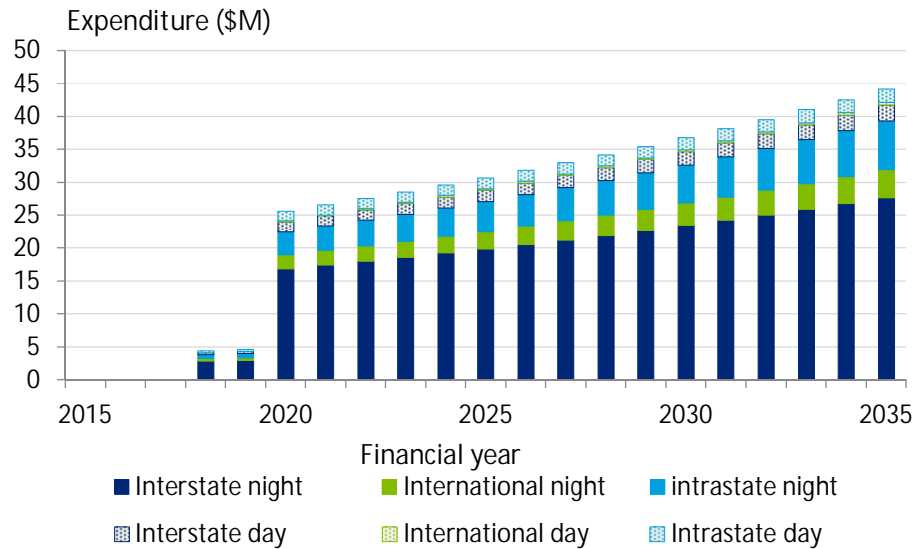


Source: BDA Marketing (2016); Deloitte Access Economics (2016)

The BDA Marketing survey found that 83% of interstate respondents would use the Cable Car, while another 85% would engage with at least one of the other new facilities to be developed, such as the visitor cafe, lounge bar, or village events. Assuming a ticket price of \$10 per person for the Cable Car, and additional expenditure \$10 per person for food and beverages at the visitors café, lounge bar, or village community events, the average overnight visitor would spend an additional \$16.90 per night. For interstate day visitors, BDA Marketing estimated their additional spend to be \$12.70 per trip. Based on the response of the intrastate respondents, intrastate overnight and day trip will spend an additional \$15.50 per night and \$13.60 per trip post Development. This does not include additional visitor expenditure on accommodation and other forms of transportation.

Combined with the increased visitor night and visitors in the region, it is estimated that an additional \$27 million in tourism expenditure will occur in Cradle Mountain as a result of the Development in 2019-20. Of this, \$21 million can be attributed to interstate and international visitors, and the remaining \$6 million to intrastate visitors. By 2035, additional expenditure will reach \$45 million. The time series of additional expenditure to the region from 2014-15 to 2034-35 is given in Chart 2.6.

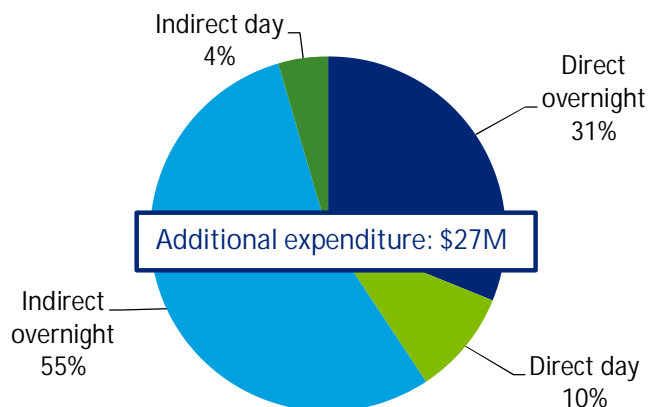
Chart 2.6: Cradle Mountain additional visitor expenditure, 2015-35



Source: BDA Marketing (2016); Deloitte Access Economics (2016)

The additional tourism expenditure in Cradle Mountain can also be categorised as either direct spending on the Cable Car and additional food and beverages, or indirect spending on other goods and services, including accommodation. Of the addition \$27 million in visitor expenditure in 2019-20, 41% of the expenditure is likely to be directly associated with the Development, with the remaining 59% likely to be accrued to other businesses within the region (Chart 2.7).

Chart 2.7: Additional Cradle Mountain visitor expenditure, 2020



Source: BDA Marketing (2016); Deloitte Access Economics (2016)

A summary of the parameters underlying the BDA forecast estimates, as derived by Deloitte Access Economics, are presented in Table 2.1. The parameters are slightly different to BDA Marketing estimates. This is driven by:

- different baseline forecasts of visitors in Australia over the modelling period, and the proportion of visitors currently visiting Tasmania and Cradle Mountain; and

- the Development is now projected to be fully operational in 2019-20 compared to 2018 in the BDA Marketing surveys, with the parameters consequently adjusted to reach the Development targets set out by BDA Marketing in 2019-20.

Table 2.1: Summary of parameters pre and post Development

	Trend outlook (2020)		Development (2020): BDA Scenario 2		Change (%)	
	Overnight	Day	Overnight	Day	Overnight	Day
Visitation rate (%)						
Interstate	9%	5%	11%	5%	19%	19%
International	17%	9%	20%	11%	19%	19%
Intrastate	3%	2%	3%	2%	13%	13%
Average nights per trip						
Interstate	1.9	NA	2.0	NA	8%	NA
International	1.9	NA	2.0	NA	8%	NA
Intrastate	2.6	NA	2.8	NA	7%	NA
Average expenditure/night (\$) ¹						
Interstate	\$201	\$56	\$221	\$71	10%	27%
International	\$92	\$26	\$101	\$32	10%	27%
Intrastate	\$139	\$47	\$155	\$60	11%	29%

Source: BDA Marketing (2016); Deloitte Access Economics (2016)

2.1.3 Additional tourism revenue to Tasmania

The additional visitor expenditure to [Tasmania](#) may be different to the additional visitor expenditure to [Cradle Mountain](#). For instance, visitors may be spending less time in the rest of Tasmania in order to spend more nights in the Cradle Mountain region. The visitors can be separated into three types:

- 'additional State' visitors include those who are induced to visit Tasmania as a result of the redevelopment;
- 'additional Cradle Mountain' visitors include those who originally planned to visit Tasmania but would not have previously visited Cradle Mountain, but consequently will visit Cradle Mountain after the Development; and
- 'additional nights' visitors include those originally planning to visit Tasmania and Cradle Mountain prior to the Development but following the Development will spend more nights overall in Tasmania .

'Additional State' visitors

As 'additional State' visitors are those induced to visit Tasmania as a result of the Cradle Mountain Development, their whole trip expenditure in Tasmania is counted as additional to the baseline scenario. To estimate the impact from this cohort, BDA Marketing conducted a follow up survey with the original survey respondents and found that 16% of

¹ BDA Marketing does not break out visitor expenditure by international/interstate visitors. The average expenditure per night for international and interstate visitors has been worked out from the ratio of average spending per night based on TRA data, and the ratio of interstate to international visitors in the Cradle Mountain region.

interstate visitors now would choose not to visit Tasmania if the Development does not proceed.² Similarly, the survey also found that 24% of intrastate respondents would now prefer to take a trip interstate (instead of travelling within Tasmania) if the Development does not proceed. These data provide the best estimates for induced 'additional State' visitor demand.

Based on the BDA Marketing survey responses, an average trip length of 9.4 days in Tasmania for interstate/international visitors (with approximately three days spent in Cradle Mountain), and 6.0 days for intrastate visitors has been assumed for these visitors. This is slightly higher than the NVS reported average for interstate visitors (eight nights), and lower than the IVS reported average for international visitors (16 nights). Average expenditure per night is based on the reported TVS and IVS figures in 2015, and assumed to stay constant (in real terms) over the modelling period.³

'Additional Cradle Mountain' visitors

As 'additional Cradle Mountain' visitors would have visited Tasmania regardless of the Development, only the visitor expenditure during any additional nights stayed in Tasmania can be counted. This would be equal to the total nights stayed in Cradle Mountain, minus any fewer nights stayed in the rest of Tasmania.

'Additional nights' visitors

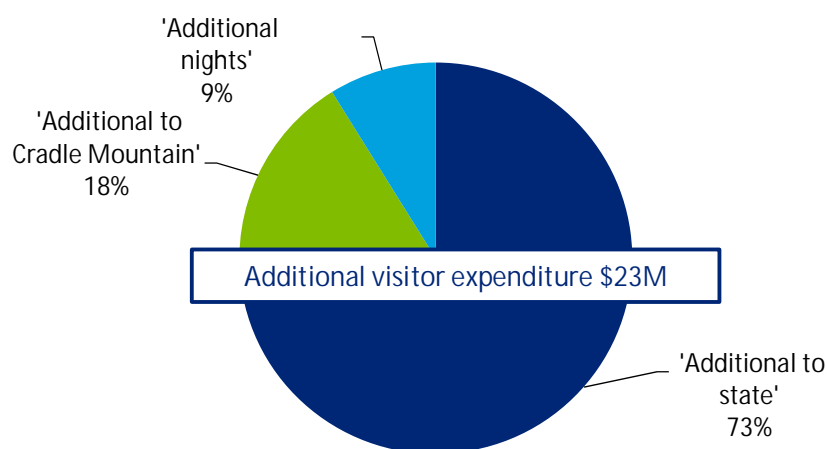
As 'additional nights' visitors would have visited Cradle Mountain regardless of the Development, their additional nights to Tasmania would be any additional nights stayed in Cradle Mountain, minus any fewer nights stayed in the rest of Tasmania. For international and interstate overnight visitors, this is assumed to be an additional 0.1 nights per visit, and 0.2 nights for intrastate visitors.

Assuming an additionality rate of 50%, and accounting for the different profiles of visitors from different source markets, total additional expenditure from interstate, international, and intrastate visitors in Tasmania will be equal to \$23 million in 2019-20 (Chart 2.8). 73% of the additional expenditure is attributable to 'additional State' visitors, who only make up only 25% of total additional visitors to Cradle Mountain.

² This is despite those respondents saying they will definitely visit Tasmania within the next two years in the initial survey pre stimulus.

³ A per night expenditure of \$211 for interstate and intrastate visitors, and \$97 for international visitors has been used.

Chart 2.8: Additional Tasmania visitor expenditure, 2020



Source: BDA Marketing (2016); Deloitte Access Economics (2016)

2.1.4 Assumptions and caveats

The accuracy of the estimates depends on the provided data and their underlying assumptions. Where possible, Deloitte Access Economics has noted the assumptions and how they may affect the forecasts.

Visitor numbers

- The BDA Marketing estimates of the proportion of visitors who visit the Cradle Mountain region may be inaccurate. For instance, the Tasmania Visitor Survey (TVS) finds that approximately 10% of all visitors in the 12 months to September 2015 'stopped or stayed overnight' in the Cradle Mountain/Valley area (Tourism Tasmania, 2015). Similarly, the Tourism Research Australia International Visitor Survey (IVS) finds that 12% of total international visitors stayed overnight in the SA2 region Sheffield – Railton, which best corresponds with the Cradle Mountain region (Tourism Research Australia, 2015). These proportions are lower than the 25% of total international visitors who visit Cradle Mountain, and the 17% who stay overnight, that have been implied by the BDA Marketing estimates;
- BDA Marketing applies the same improvements in visitation to interstate respondents as to international visitors. For instance, BDA Marketing estimated that interstate visitors (and by extension international visitors) to Tasmania were 19% more likely to visit Cradle Mountain after they have seen the 'tomorrow' stimulus. Given that a higher proportion of international visitors already choose to visit Cradle Mountain, the Development may have diminishing impacts on their willingness to visit Cradle Mountain;
- BDA Marketing also assumes that the Development increases chances of visitation equally for overnight and day trip visitors. It is possible that because the majority of proposals – including the Cable Car – are aimed at improving visitor day experience rather than the overnight experience, it might attract overnight visitors to a lesser degree than day trip visitors; and

- other considerations that could impact the accuracy of the results include the representativeness of the sample respondents relative to the visitor population, and the ability to communicate the Development to the relevant audience and realise the full effects of the Development.

Visitor nights

- The BDA Marketing estimates of visitor nights in the 'trend outlook' scenario might not be accurate for international visitors. While the data is largely consistent with TVS data, which finds that visitors stayed an average of 2.0 nights in the region (Tourism Tasmania, 2015), it is possible that international visitors may choose to stay a different length of time compared to interstate visitors. The IVS and National Visitor Survey (NVS) suggesting that international visitors stay for 0.2 nights less on average in the Sheffield – Railton region compared to interstate visitors; and
- the average nights by overnight visitors to Cradle Mountain used by BDA Marketing in the forecasts are different to reported survey responses. For instance, respondents increased their intended nights of stay in Cradle Mountain from 2.9 pre stimulus to 3.5 post 'tomorrow' stimulus on average, this is higher than the 1.9 to 2.0 nights figures used in the BDA Marketing forecasts. These BDA Marketing assumptions could potentially be adjusting for the longer lengths of stays reported by the survey sample compared to the current visitor population however this is not clearly defined.

Visitor expenditure

- As BDA Marketing highlighted in their report, the estimates of visitor expenditure does not include the conversion of existing day visitors into overnight visitors (or vice versa) and any changes in total tourism expenditure that would likely result from the change;
- the BDA Marketing survey also assumes that visitor expenditure on the Cable Car tickets and additional food and beverages can be considered fully additional to Cradle Mountain. To the extent that visitors divert their spending from existing vendors in Cradle Mountain to the new attractions, the amount of tourism expenditure additional to the region would likely be smaller than the provided estimates; and
- financial modelling by SCA Marketing estimates the Cable Car would need to cost \$25 per ticket for adults (\$12.50 per child/pensioner) to break even on the Development's return on capital. This is higher than the \$10 assumed by BDA Marketing, and would increase the visitor expenditure in the Cradle Mountain region. However, it is also likely the higher price may deter some visitors from visiting the region or from using the Cable Car. As yet, though, there has been no formal analysis of the associated price elasticity of demand.

'Additionality' example

An illustrative example of the visitor nights and expenditure by the three visitor types additional to Tasmania is given below (Table 2.2). In the example an additionality of 50% is used, such that visitors will spend an additional 0.5 nights in Tasmania overall for each additional night in Cradle Mountain (and 0.5 nights fewer in the rest of Tasmania). Although the number of visitors in each cohort is the same, there is a noticeable difference in the additional expenditure to Tasmania, with 'additional State' visitors contributing the most.

Table 2.2: Example of additionality to Tasmania by visitor cohort

#	Description	'Additional State' visitors	'Additional CM' visitors	'Additional nights' visitors	Notes
(1)	Visitor Number	100	100	100	Example
(2)	Nights in CM ¹ (before Development)	0	0	1.9	Table 2.1
(3)	Nights in CM (after Development)	2.0	2.0	2.0	Table 2.1
(4)	Additional nights in CM	2.0	2.0	0.1	(3)-(2)
(5)	Additionality	NA	50%	50%	Assumption
(6)	Additional nights in Tasmania	9.4 ²	1.0	0.05	(5)x(4)
(7)	Additional nights in Rest of Tasmania	7.4	-1.0	-0.05	(6)-(4)
(8)	Average expenditure (\$)	211	211	211	TVS
(9)	Additional expenditure to Tasmania (\$000)	198	21	1	(1)x(6)x(8)

Source: Deloitte Access Economics (2016)

Note: (1) CM = Cradle Mountain, (2) BDA marketing (2016)

2.2 Scenarios and specifications

Economic impact analysis measures the change in key economic indicators, such as GSP and employment, caused by changes in economic activity relative to a 'business as usual' or 'baseline' scenario. The definition of the baseline and the development scenarios to be modelled is important to clearly differentiate the economic impacts which are incremental.

2.2.1 Scenarios

In the **baseline scenario**, the proposed Developments at Cradle Mountain do not proceed and will not proceed over the life of the modelling period. Growth in visitors and visitor nights follow trend projections.

In the **two development scenarios**, the proposed Development proceed, and additional tourism expenditure occurs within Cradle Mountain (section 2.1.2). The scenarios are differentiated by:

- the estimated cost of the Cable Car, at either \$60 million or \$70 million; and
- the degree of public funding for the Cable Car.

Scenario 1 can be thought of as a lower impact case with a higher degree of public funding required for the Cable Car, and a lower investment of \$60 million required overall. **Scenario 2** can be thought of as the high impact case, with a lower degree of public funding, and a higher investment required for the Cable Car. All scenarios are assumed to have the same impacts on visitor numbers and expenditure.

The results for alternative scenarios (i.e. high public funding combined with high capital expenditure; low public funding combined with low capital expenditure) are likely to fall between the results for scenarios 1 and 2.

2.2.2 Specifications

For each of the development scenarios, [three attribution specifications](#) (high, central, and low) are also analysed. The specifications differ in:

- the treatment of the capital expenditure for the hotel;
- the degree of additionality that occurs at the Tasmania state level; and
- the treatment of retained visitor expenditure from intrastate visitors.

These specifications have been used to highlight uncertainty over key parameters – including the additional nights likely to occur in Tasmania – as well as to explicitly analyse components that are conventionally excluded from economic assessments of developments – adjacent developments and retained expenditure from intrastate visitors.

The [hotel has not been included in the low and central specifications](#) as it is not directly a part of the proposed Development, and there's a degree of speculation in assigning a third party development.

The [retained expenditure from intrastate visitors has not been included in the low and central specifications](#). This is consistent with the recommended methodology for economic evaluations and the results can be thought of as a conservative estimate (Jago & Dwyer, 2006). The retained expenditure is included in the high specification.

The average daily expenditure in Tasmania has been taken, as it is expected that visitors will average out their spending over the whole trip. A lower and upper bound of 0% and 100% additionality is tested in the low and high specifications respectively.

In the central specification, there is \$18 million in additional tourism expenditure to Tasmania, and it ranges from \$11 million to \$29 million in the low and high specifications. A summary of the differences between the six scenarios is given in Table 2.3.

Table 2.3: Summary of scenarios and specifications

Funding scenario	Scenario 1			Scenario 2		
Specification	High	Central	Low	High	Central	Low
Capital expenditure (\$M)	163	101	101	173	111	111
Cable Car	60	60	60	70	70	70
Other developments	41	41	41	41	41	41
Hotel	62	NA	NA	62	NA	NA
Gov't funding for Cable Car	100%	100%	100%	80%	80%	80%
Additional nights in Tasmania (%)	100%	50%	0%	100%	50%	0%
Tourism expenditure (2020 - \$M)	29	18	11	29	18	11
Interstate	20	15	10	20	15	10
International	3	3	2	3	3	2
Intrastate	5	NA	NA	5	NA	NA

Source: Deloitte Access Economics (2016)

2.3 Modelling approach

The profile of capital expenditure and additional tourism expenditure to Tasmania are then used as inputs into the Deloitte Access Economics – Regional General Equilibrium Model (DAE-RGEM).

Computable General Equilibrium (CGE) models are able to capture the overall net effects of a project on economic activity, or gross state product. They account for both the flow-on impacts to upstream sectors, while capturing the resource constraints present in the economy, with increased activity in one sector necessarily drawing on resources from other sectors, and ‘crowding out’ existing activity.

The tourism and other operational expenditure inputs described above will flow through the CGE model through the following channels:

- **increased capital expenditure** required to develop the Cradle Mountain Development;
- **increased tourism expenditure to Tasmania** likely to result from the Development, with activity concentrated in tourism related sectors; and
- **an increase in Tasmanian taxation** to account for State Government funding.

The increase in taxation accounts for the assumption that over the long run, Government budget balance is kept, with any publically expenditure having to be repaid by an equivalent increase in tax revenue.

3 Results

This section presents the results of the CGE modelling, comparing a [baseline](#) scenario where the Cradle Mountain Developments do not proceed, with the [Development](#) scenarios. The impacts are presented from 2016-17 to 2034-35, and at state level.

3.1 GSP deviation

Central specification

Under [Scenario 1](#) (high degree of public funding combined with a lower investment amount for the Cable Car), GSP is initially expected to be \$1.3 million lower compared to the baseline scenario under the [central](#) case. This is equivalent to approximately 0.004% of the Tasmanian GSP. This is driven by the \$20 million in additional taxation revenue that has to be raised by the Tasmanian government to cover funding for the World Heritage Wilderness Village developments, which outweigh the expansionary economic activity associated with increased investment levels.⁴

Over the remaining construction period from 2017-18 to 2018-19, the GSP deviation turns positive as investment increases and stimulates additional activity in the construction sector. The positive GSP deviation peaks in 2018-19, at \$3.4 million (0.01% of GSP).

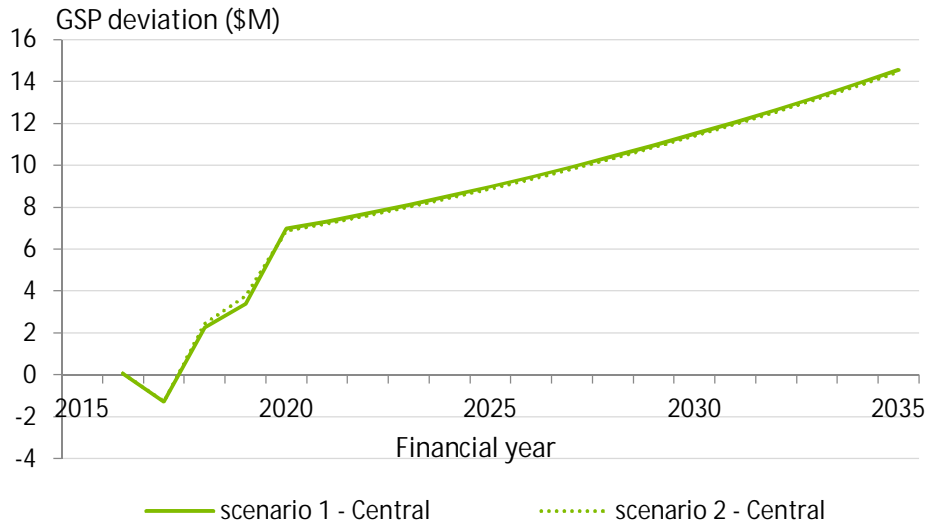
The economic impacts under [Scenario 2](#) are largely similar compared to Scenario 1. The GSP deviation during the construction period is slightly higher (\$3.8 million compared to the baseline), with the differential driven by both a high level of investment and lower degree of public funding for the Cable Car in Scenario 2 compared to the Scenario 1.

As the Development becomes fully operational in 2019-20, GSP in the development scenarios is expected to be \$7.0 million (0.03% of GSP) higher compared to the baseline scenario. The additional economic activity is likely to occur in the industries that support additional tourism activity in Tasmania, including retail trade, transportation, and recreation.

GSP deviations are expected to remain positive throughout the forecast, growing over time in line with the additional tourism expenditure to Tasmania. By 2034-35, the GSP deviation is expected to be \$14.6 million, equivalent to 0.05% of the baseline GSP. As there is expected to be no difference in attracting additional visitors between the scenarios, the GSP deviations in the operational period between scenarios are broadly similar (Chart 3.1).

⁴ The remaining \$19 million in taxation is raised by residents of the rest of Australia through increased federal taxation.

Chart 3.1: GSP deviation in central specification, FY2017-35

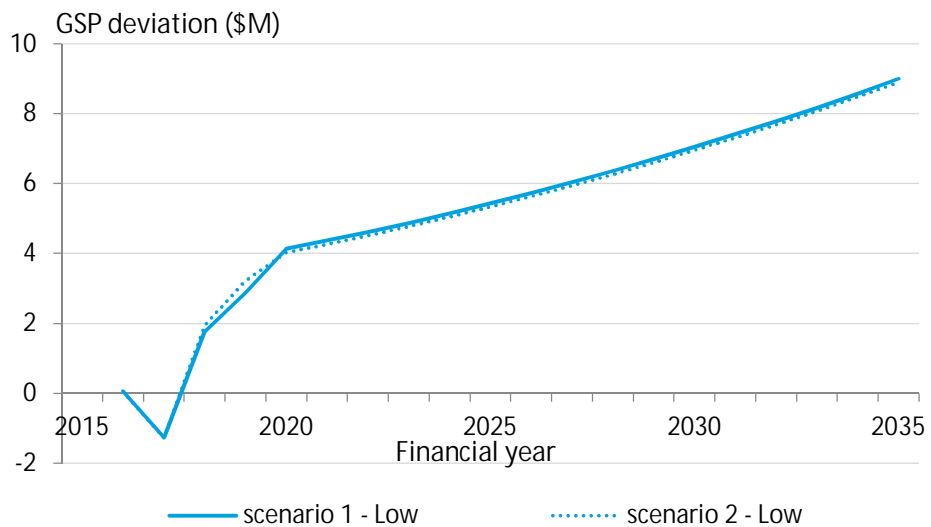


Source: Deloitte Access Economics (2016)

Low specification

Under the **low** specification, the GSP deviation is broadly similar during the construction period – driven by the same expenditure profile – before seeing a slighter lower deviation once the developments become operational as a result of the lower visitor additionality to Tasmania. The GSP deviation is \$4.1 million higher in 2019-20, before increasing to \$9.0 million by 2034-35. The year-to-year GSP deviation over the forecast in the scenarios under the low case is shown below in Chart 3.2.

Chart 3.2: GSP deviation in low specification, FY2017-35



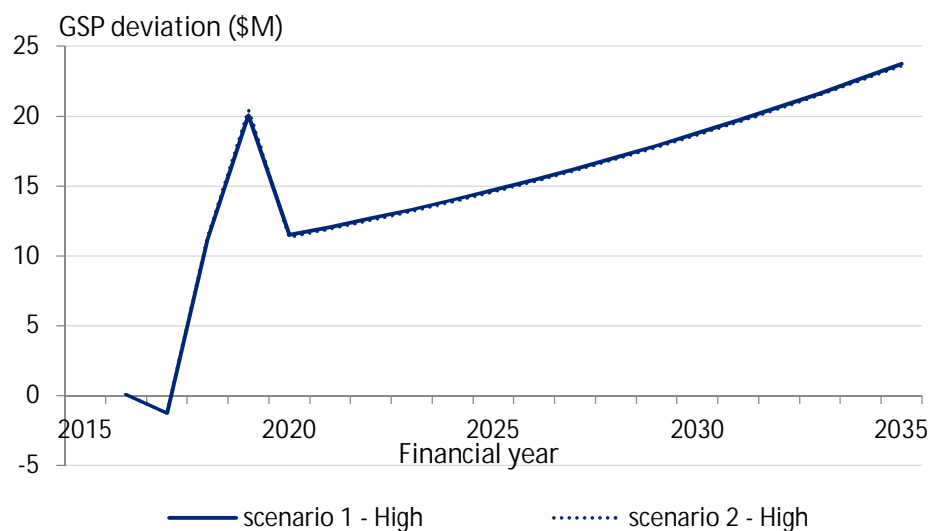
Source: Deloitte Access Economics (2016)

High specification

Under the **high** specification, the GSP deviation peak during the construction period is higher compared to the other two cases, reaching \$20.1 million in 2018-19. This is driven by the additional activity generated by the construction of the privately funded hotel. The GSP deviation in 2019-20 is \$11.5 million, driven by an additional \$11 million in additional visitor expenditure compared to the central case.

By the end of the forecast in 2034-35, the GSP is expected to be \$23.7 million higher compared to the baseline scenario where the Development did not take place (Chart 3.3). This is equivalent to 0.07% of the baseline GSP.

Chart 3.3: GSP deviation in high specification, FY2017-35



Source: Deloitte Access Economics (2016)

3.2 Employment deviation

Central specification

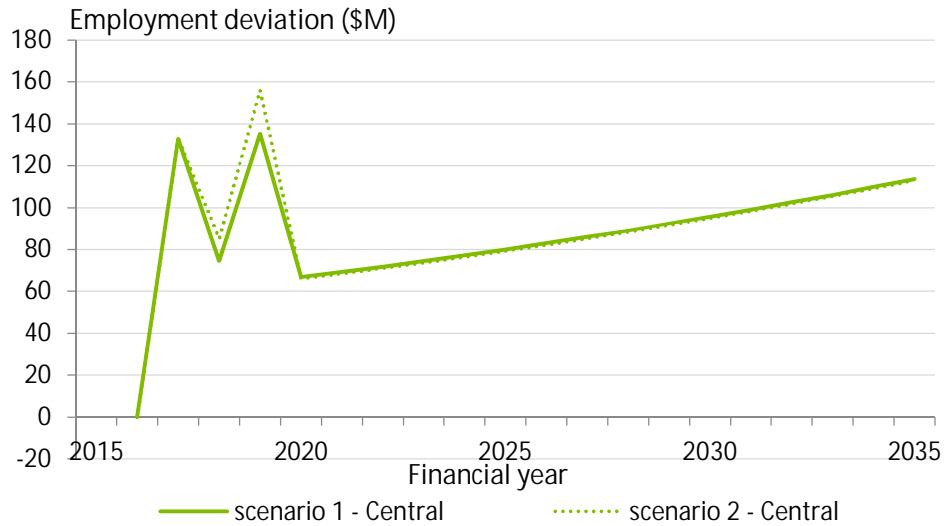
The employment deviation is expected to move in an opposite direction to the GSP deviation in 2016-17, with an additional 133 full-time equivalent (FTE) jobs created in the Tasmanian economy compared to the baseline under the **central** case. This is equivalent to a 0.17% increase in the Tasmanian labour force.

Indeed, while the increase in state taxation dampens overall economic activity, the increased level of investment in the economy shifts resources towards more labour intensive sectors, such as construction.

The employment deviation peaks in 2018-19, coinciding with the height of capital expenditure. An additional 135 FTE jobs are created under **Scenario 1**, and an additional 156 FTE jobs are created under **Scenario 2**. Similar to GSP, the difference is driven by the overall levels of investment and the additional taxation required in the economy.

As the Development becomes operational in 2019-20, approximately 66 FTE jobs will be created in the Tasmanian economy compared to the baseline scenario. The year-to-year employment deviation in the development scenarios (central case) is shown below in Chart 3.4.

Chart 3.4: Employment deviation in central specification, FY2017-35



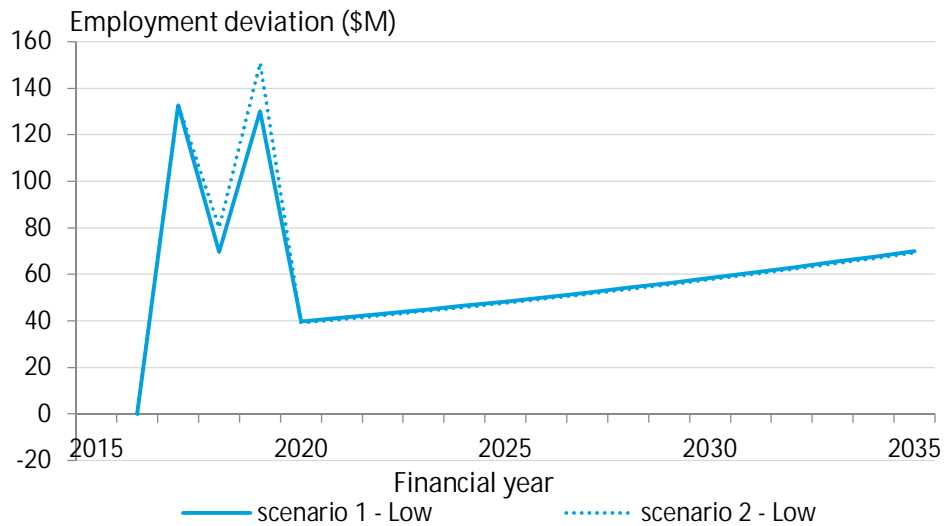
Source: Deloitte Access Economics (2016)

Low specification

Under the **low** specification, the employment deviation is highest in 2016-17 under **Scenario 1**, reaching 133 FTE jobs, while highest in 2019-20 in **Scenario 2**, reaching 151 FTE jobs. The difference is driven by the greater construction activity under Scenario 2 compared to Scenario 1, as more capital expenditure is required for the construction of the Cable Car over 2017-18 to 2018-19.

During the operational period, the employment deviation becomes 40 FTE jobs under both scenarios in 2019-20, and reaches 70 FTE jobs by 2034-35 (Chart 3.5).

Chart 3.5: Employment deviation in low specification, FY2017-35



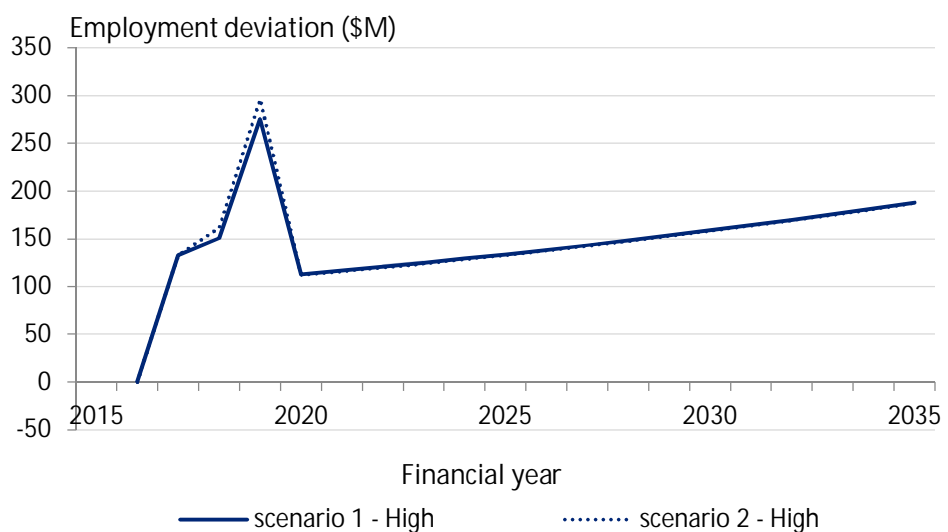
Source: Deloitte Access Economics (2016)

High specification

Under the high specification, the employment deviation over the baseline scenario is reached in 2019-20, with an additional 275 FTE jobs created in the Tasmanian economy under Scenario 1, and an additional 296 FTE jobs under Scenario 2. This is equal an increase of approximately 0.08% in the Tasmanian workforce.

The employment deviation falls to 11 FTE jobs in 2019-20, as the GSP deviation in the economy decreases, before increasing to 187 FTE jobs by 2034-35 (Chart 3.6).

Chart 3.6: Employment deviation in high specification, FY2017-35



Source: Deloitte Access Economics (2016)

Cumulative impacts

To frame the cumulative economic impacts of the Cradle Mountain Development, the stream of value-added gains from 2015-16 to 2034-35 is converted to present terms using a discount rate of 7%. In total, the net present value (NPV) of future GSP gains is estimated to be \$73 million in the central case. It ranges between \$45 million in the low case to \$138 million in the high case. Over the same period, an average of 88 additional FTE jobs will be supported in the Tasmanian economy in the central specification (Scenario 1). This ranges from 60 to 146 FTE jobs in the low and high specifications. The differences in investment needed for the cable car and the proportion of public funding is expected to have minimal impacts on the results.

A summary of the net impacts both cumulatively and at five year intervals on the Tasmanian economy is outlined in Table 3.1.

Table 3.1: Summary impacts, 2015-16 to 2034-35

FY	2016-35	2017	2020	2025	2030	2035
GSP Deviation (\$M)						
Scenario 1 - High Gov funding/low capital expenditure						
High	138	-1	11	15	19	24
Central	73	-1	7	9	11	15
Low	45	-1	4	5	7	9
Scenario 2 - Low Gov funding/high expenditure						
High	137	-1	11	15	19	24
Central	73	-1	7	9	11	14
Low	45	-1	4	5	7	9
Employment deviation (FTE)						
Scenario 1 - High Gov funding/low capex expenditure						
High	146	133	113	134	159	188
Central	88	133	67	80	96	114
Low	60	133	40	48	58	70
Scenario 2 - Low Gov funding/high capex expenditure						
High	147	133	112	133	158	187
Central	89	133	66	79	95	113
Low	61	133	39	48	58	69

Source: Deloitte Access Economics (2016)

Other considerations

While there is expected to be overall positive GSP and employment benefits associated with the proposed Development, there are also potential downsides to the Development that have not been quantified. For instance, some BDA Marketing survey respondents have raised concerns about the impact of the development on the surroundings, or believe it detract from the natural environment. It is possible these developments could also cause a proportion of the visitors already planning on visiting Cradle Mountain to visit alternative national park destinations, which has been outside the scope of the analysis.

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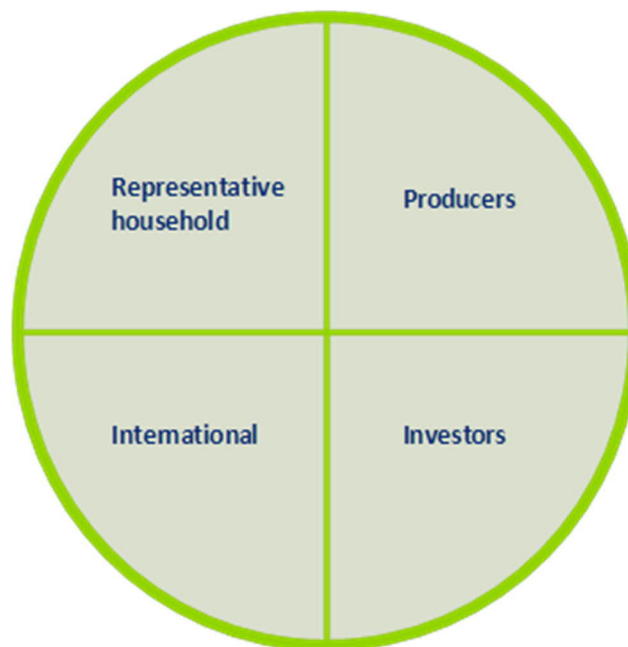
Appendix A: CGE modelling

The Deloitte Access Economics – Regional General Equilibrium Model (DAE-RGEM) is a large scale, dynamic, multi-region, multi-commodity computable general equilibrium model of the world economy. The model allows policy analysis in a single, robust, integrated economic framework. This model projects changes in macroeconomic aggregates such as GDP, employment, export volumes, investment and private consumption. At the sectoral level, detailed results such as output, exports, imports and employment are also produced.

The model is based upon a set of key underlying relationships between the various components of the model, each which represent a different group of agents in the economy. These relationships are solved simultaneously, and so there is no logical start or end point for describing how the model actually works.

Figure D.1 shows the key components of the model for an individual region. The components include a representative household, producers, investors and international (or linkages with the other regions in the model, including other Australian States and foreign regions). Below is a description of each component of the model and key linkages between components. Some additional, somewhat technical, detail is also provided.

Figure A.1: Key components of DAE-RGEM



DAE-RGEM is based on a substantial body of accepted microeconomic theory. Key assumptions underpinning the model are:

- The model contains a 'regional consumer' that receives all income from factor payments (labour, capital, land and natural resources), taxes and net foreign income from borrowing (lending).
- Income is allocated across household consumption, government consumption and savings so as to maximise a Cobb-Douglas (C-D) utility function.
- Household consumption for composite goods is determined by minimising expenditure via a CDE (Constant Differences of Elasticities) expenditure function. For most regions, households can source consumption goods only from domestic and imported sources. In the Australian regions, households can also source goods from interstate. In all cases, the choice of commodities by source is determined by a CRESH (Constant Ratios of Elasticities Substitution, Homothetic) utility function.
- Government consumption for composite goods, and goods from different sources (domestic, imported and interstate), is determined by maximising utility via a C-D utility function.
- All savings generated in each region are used to purchase bonds whose price movements reflect movements in the price of creating capital.
- Producers supply goods by combining aggregate intermediate inputs and primary factors in fixed proportions (the Leontief assumption). Composite intermediate inputs are also combined in fixed proportions, whereas individual primary factors are combined using a CES production function.
- Producers are cost minimisers, and in doing so, choose between domestic, imported and interstate intermediate inputs via a CRESH production function.
- The model contains a more detailed treatment of the electricity sector that is based on the 'technology bundle' approach for general equilibrium modelling developed by ABARE (1996).
- The supply of labour is positively influenced by movements in the real wage rate governed by an elasticity of supply.
- Investment takes place in a global market and allows for different regions to have different rates of return that reflect different risk profiles and policy impediments to investment. A global investor ranks countries as investment destinations based on two factors: global investment and rates of return in a given region compared with global rates of return. Once the aggregate investment has been determined for Australia, aggregate investment in each Australian sub-region is determined by an Australian investor based on: Australian investment and rates of return in a given sub-region compared with the national rate of return.
- Once aggregate investment is determined in each region, the regional investor constructs capital goods by combining composite investment goods in fixed proportions, and minimises costs by choosing between domestic, imported and interstate sources for these goods via a CRESH production function.
- Prices are determined via market-clearing conditions that require sectoral output (supply) to equal the amount sold (demand) to final users (households and government), intermediate users (firms and investors), foreigners (international exports), and other Australian regions (interstate exports).

- For internationally-traded goods (imports and exports), the Armington assumption is applied whereby the same goods produced in different countries are treated as imperfect substitutes. But, in relative terms, imported goods from different regions are treated as closer substitutes than domestically-produced goods and imported composites. Goods traded interstate within the Australian regions are assumed to be closer substitutes again.
- The model accounts for greenhouse gas emissions from fossil fuel combustion. Taxes can be applied to emissions, which are converted to good-specific sales taxes that impact on demand. Emission quotas can be set by region and these can be traded, at a value equal to the carbon tax avoided, where a region's emissions fall below or exceed their quota.

The representative household

Each region in the model has a so-called representative household that receives and spends all income. The representative household allocates income across three different expenditure areas: private household consumption; government consumption; and savings.

Going clockwise around Figure B, the representative household interacts with producers in two ways. First, in allocating expenditure across household and government consumption, this sustains demand for production. Second, the representative household owns and receives all income from factor payments (labour, capital, land and natural resources) as well as net taxes. Factors of production are used by producers as inputs into production along with intermediate inputs. The level of production, as well as supply of factors, determines the amount of income generated in each region.

The representative household's relationship with investors is through the supply of investable funds – savings. The relationship between the representative household and the international sector is twofold. First, importers compete with domestic producers in consumption markets. Second, other regions in the model can lend (borrow) money from each other.

Some detail

- The representative household allocates income across three different expenditure areas – private household consumption; government consumption; and savings – to maximise a Cobb-Douglas utility function.
- Private household consumption on composite goods is determined by minimising a CDE (Constant Differences of Elasticities) expenditure function. Private household consumption on composite goods from different sources is determined by a CRESH (Constant Ratios of Elasticities Substitution, Homothetic) utility function.
- Government consumption on composite goods, and composite goods from different sources, is determined by maximising a Cobb-Douglas utility function.
- All savings generated in each region are used to purchase bonds whose price movements reflect movements in the price of generating capital.

Producers

Apart from selling goods and services to households and government, producers sell products to each other (intermediate usage) and to investors. Intermediate usage is where one producer supplies inputs to another's production. For example, Hotels supply inputs to the services sectors where travel is a part of client service.

Capital is an input into production. Investors react to the conditions facing producers in a region to determine the amount of investment. Generally, increases in production are accompanied by increased investment. In addition, the production of machinery, construction of buildings and the like that forms the basis of a region's capital stock, is undertaken by producers. In other words, investment demand adds to household and government expenditure from the representative household, to determine the demand for goods and services in a region.

Producers interact with international markets in two main ways. First, they compete with producers in overseas regions for export markets, as well as in their own region. Second, they use inputs from overseas in their production.

Some detail

- Sectoral output equals the amount demanded by consumers (households and government) and intermediate users (firms and investors) as well as exports.
- Intermediate inputs are assumed to be combined in fixed proportions at the composite level. As mentioned above, the exception to this is the electricity sector that is able to substitute different technologies (brown coal, black coal, oil, gas, hydropower and other renewables) using the 'technology bundle' approach developed by ABARE (1996).
- To minimise costs, producers substitute between domestic and imported intermediate inputs is governed by the Armington assumption as well as between primary factors of production (through a CES aggregator). Substitution between skilled and unskilled labour is also allowed (again via a CES function).
- The supply of labour is positively influenced by movements in the wage rate governed by an elasticity of supply is (assumed to be 0.2). This implies that changes influencing the demand for labour, positively or negatively, will impact both the level of employment and the wage rate. This is a typical labour market specification for a dynamic model such as DAE-RGEM. There are other labour market 'settings' that can be used. First, the labour market could take on long-run characteristics with aggregate employment being fixed and any changes to labour demand changes being absorbed through movements in the wage rate. Second, the labour market could take on short-run characteristics with fixed wages and flexible employment levels.

Investors

Investment takes place in a global market and allows for different regions to have different rates of return that reflect different risk profiles and policy impediments to investment. The global investor ranks countries as investment destination based on two factors: current economic growth and rates of return in a given region compared with global rates of return.

Some detail

- Once aggregate investment is determined in each region, the regional investor constructs capital goods by combining composite investment goods in fixed proportions, and minimises costs by choosing between domestic, imported and interstate sources for these goods via a CRESH production function.

International

Each of the components outlined above operate, simultaneously, in each region of the model. That is, for any simulation the model forecasts changes to trade and investment flows within, and between, regions subject to optimising behaviour by producers, consumers and investors. Of course, this implies some global conditions must be met such as global exports and global imports are the same and that global debt repayments equals global debt receipts each year.

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Contact us

Deloitte Access Economics
ACN: 149 633 116

550 Bourke St
Melbourne VIC 3000
GPO Box 78
Melbourne VIC 3001 Australia

Tel: +61 2 6175 2000
Fax: +61 2 6175 2001

www.deloitteaccesseconomics.com.au

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