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NEW ZEALAND INSTITUTE OF ECONOMIC RESEARCH

Economic impacts of Queenstown Convention Centre

A dynamic CGE analysis

NZIER final report to MBIE

2 April 2014

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NZIER was established in 1958.

Authorship

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Key points

NZIER was asked to use its dynamic Computable General Equilibrium model of the New Zealand and Queenstown regional economies to estimate the economic impacts of the construction and operation of a Queenstown Convention Centre.

Regional impacts

- QCC will require $47.3 million to build, along with $1.9 million of associated infrastructure development in Queenstown.
- During this period and initial part-year of operation (2016), gross regional product (GRP) will be $36 million higher while regional consumption will rise by $46 million.
- Once operational, in our central scenario QCC will attract some $25.4 million of additional spending into the regional economy.
- Most of this spending ($18.8 million) will be from domestic visitors from other parts of New Zealand, with the remainder from international visitors ($5.6 million).
- This additional spending will lift both gross regional product and regional consumption (our regional welfare measure) by $24 million.
- The total regional economic impact for the 2015-2017 period will be $65.8 million.

National impacts

- During the construction phase and initial year of operation, national GDP will be higher by $50 million and economic welfare (as measured by compensating variation[1]) will rise by $47 million.
- The impact of the QCC on the national economy, once it is operational, is relatively small, with national GDP lifting by an additional $13 million and welfare by $5 million in the central scenario.
- This is because the only additional spending at a national level is from international visitors that are attracted to Queenstown for conferences and then spend some additional time exploring the country while they are here.
- The spending of domestic conference attendees is all a transfer at the national level, as that spending would otherwise have occurred elsewhere, either at conferences in other locations like Rotorua, or on other goods and services.
- The total national economic impact for the 2015-2017 period will be $63.6 million.

Sensitivity analysis

- If international visitor spending were to be 15% higher than in our central scenario, perhaps due to a highly successful marketing effort, regional GDP would rise by $69.9 million, compared to $65.8 million in the central

[1] We are able to measure compensating variation at the national level only.

scenario. Regional consumption would rise by $74.1 million, compared to $70.9 million.

Limitations to analysis

Our analysis does not purport to be a full cost benefit analysis, or an investment appraisal. We do not consider how the QCC would be funded, or consider alternative uses for that funding.

We have relied on earlier reports and discussions with officials to inform our assumptions. Should additional information on the demand for events come to light, we recommend re-running the model.

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1. Objectives and scope

We have been asked to estimate the potential economic impacts of a proposed Queenstown Convention Centre (QCC) using our dynamic Computable General Equilibrium (CGE) model of the New Zealand economy and its key regions. The QCC is estimated to cost $47.6 million to build, require an additional $1.9 million of surrounding infrastructure improvements, and host around 170 events within five years of opening.

Our focus is on the direct and flow-on effects, both positive and offsetting, of the construction and operations phases of QCC. We analyse these impacts at the national level and the regional level.

We do not analyse how the QCC would be funded. We do not have any information on the potential contributions from the private sector, local government and central government, so are silent on this issue. Therefore our report should not be seen as a cost-benefit analysis or complete investment appraisal, but rather as one input into policymakers' evidence base.

The question we consider is:

> *If a QCC is built and attracts a given number and type of events, and surrounding infrastructure is improved, what will the direct and flow-on impacts be on the regional and New Zealand economies?*

Our events data is based on Horwath HTL (2012).[2] Given the very short timeframe to complete this modelling work, we were unable to investigate the underlying data in any depth. We largely took Horwath's figures as given.

Given the inherent uncertainty in forecasting how many, and what types, of events the QCC would attract, we consider alternative 'Conservative' and 'Aspirational' scenarios that incorporate +/- 15% more/less international visitor spending than in our central scenario, to get a sense of how the regional and national impacts might vary. Should any updated projections of event numbers and expenditure become available, there would be value in re-running our modelling. Similarly, we are happy to re-do the modelling when there is more information on funding options in order to get a better sense of the distribution of costs and benefits.

We do not consider other potential impacts of QCC, such as smoothing visitor flows to Queenstown and New Zealand in the off-peak tourism periods, although these are relevant considerations in a broader analysis of the potential costs and benefits of QCC.

[2] Horwath HTL. (2012). 'Proposed Queenstown Conference Centre: Feasibility Study'. Report to Queenstown Lakes District Council, July 2012.

2. Modelling approach

We use NZIER's dynamic CGE model to analyse the economic impacts of a QCC. This model was also used to assess the National Convention Centre (see NZIER, 2011).[3]

QCC will have a number of positive economic impacts...

The QCC will create economic opportunities for the regional and national economy. During its construction and infrastructure improvement phase (2015 and early 2016), QCC will support the Queenstown construction sector and draw in materials from other sectors of the regional economy.

When the QCC is operational, it will attract new visitors to New Zealand from overseas, who are likely to stay on beyond the duration of the event they are attending and thus contribute to tourism spending. International delegates often tend to bring their family to accompany them, further lifting tourism expenditure, both in Queenstown and elsewhere in New Zealand if visitors extend their conference stays to travel to other parts of the country.

In addition, QCC will draw visitors from other parts of New Zealand into Queenstown. This provides a further boost to the Queenstown regional economy, at the expense of the rest of New Zealand.[4]

The initial or "direct" injections of construction, infrastructure and tourism expenditures have flow-on effects that filter through the national and regional economies. For example, as international visitors demand more accommodation, this also pushes up the demand for the food and drink required to sustain them, laundry services, transport, etc. The additional demand for workers in these downstream industries pushes up their wages, which allows them to spend more on goods and services. This has further flow-on or multiplier effects.[5]

...with some offsetting impacts

Any economywide modelling also needs to take into account the potential offsetting effects associated with the increased construction, infrastructure or tourism spending. One example of such an effect is 'Dutch disease', whereby increased exports of tourism push up the New Zealand dollar exchange rate, making all other exporters less competitive. Even if this appreciation is small, it will still be felt across all exporting industries.

Similarly, if wages increase in the building sector (for example) during the construction phase, this will also increase the input costs for all other sectors in the economy that use builders, which reduces their competitiveness.

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3 NZIER. (2011). 'National and regional impact of the National Convention Centre: A general equilibrium evaluation'. Report to Sky City Auckland and Ministry of Economic Development, June 2011.

4 These national level events do not expand the size of the New Zealand economy: domestic spending just moves from other parts of New Zealand to Queenstown, leaving the country as a whole no better off. We do not consider any changes in consumer surplus that might arise from attending an event in Queenstown instead of (say) Wellington or Rotorua.

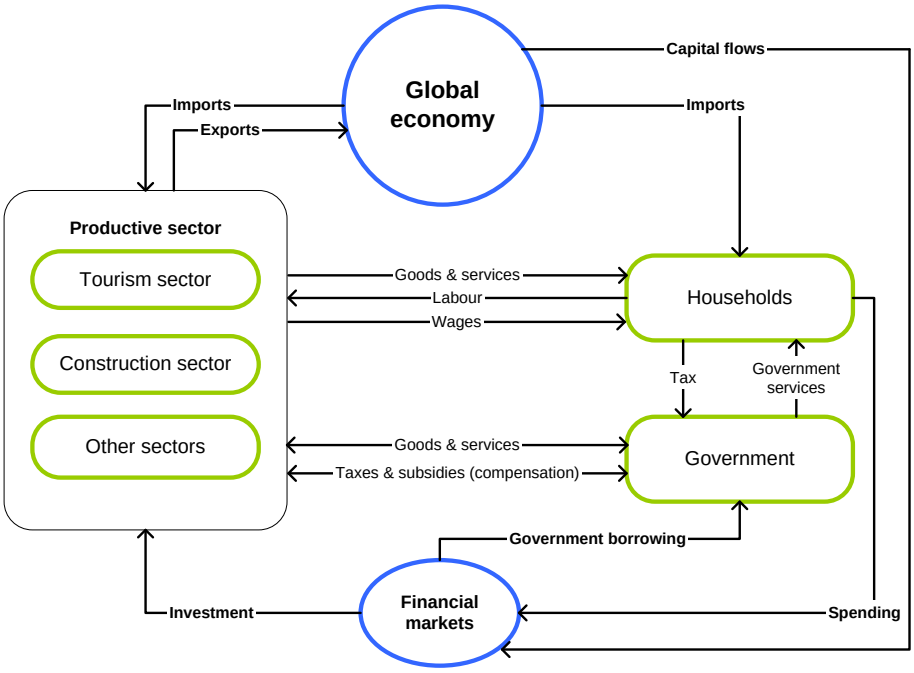
5 Other methodologies, such as multiplier analysis or Economic Impact Analysis based on input-output data, tend to overstate economic benefits, without taking into account offsetting factors such as resource costs and availability. CGE analysis addresses these shortcomings and provides a more robust, credible set of results. See Gretton, P. (2013). 'On input-output tables: uses and abuses'. Staff Research Note, Australian Productivity Commission, Canberra, for a discussion.

Our CGE model captures these effects

The MONASH-NZ dynamic CGE model is a representation of the New Zealand economy and its regional components that contains information on 106 industries and 205 commodities in its basic form.

The model captures the various inter-linkages between these sectors, as well as their links to households (via the labour market), the government sector, capital markets and the global economy (via imports and exports). A visual representation is shown in Figure 1, highlighting the complex and multidirectional relationships between the various parts of an economy.

Figure 1 Components of a CGE model



Source: NZIER

Key features of the model are:

- Each industry can produce a number of different commodities.
- Production inputs are intermediate commodities (domestic and imported) and primary factors (labour, land and capital).
- The demand for primary factors and the choice between imported and domestic commodities are determined by Constant Elasticity of Substitution (CES) production nests. This means an increase in price of one input shifts sourcing towards another input.
- Intermediate goods, primary factors and other costs are combined using a Leontief production function. This means the proportion of production inputs is held constant for all levels of output.

- The production mix of each industry is dependent on the relative prices of each commodity. The proportion of output exported or consumed domestically is also dependent on relative prices.
- Policy impacts are often unevenly spread across industries and regions. To capture these heterogeneous effects, the model is extended to include a regional component. A 'top-down' approach is used to decompose national impacts to the regional level, using regional data as weighting.[6]

...with dynamic adjustment features

The model is dynamic, meaning that we can examine changes to the economy over time and see how key variables respond as the economy returns back to its long run growth path. MONASH-NZ is a recursive dynamic CGE model. It can be thought of as a series of static simulations linked by three dynamic adjustment procedures:

1. **Labour market adjustment**: We assume that wages are sticky in the short run and gradually adjust over time. This means that labour market effects are initially seen through changes to employment. As employment returns to the NAIRU[7] over time, the labour market returns to equilibrium through changes in real wages.
2. **Capital formation**: An industry-specific capital accumulation mechanism allows industries to build their stock of capital over time. Capital is generated by investment, which in turn responds to rates of return in each industry.
3. **Balance of payments adjustment**: The model tracks changes in the current account and capital account over time. Changes in net foreign liabilities affect domestic consumption through the level of interest that must be paid to service the foreign debt.

Core data is based on Statistics New Zealand's input output tables...

The model is based on a large database containing the value flows of the economy. The database defines the initial structure of the economy, which by definition is assumed to be in equilibrium in all markets.

The structure of the database is broadly similar to traditional input-output tables. For example, commodities may be used as intermediate inputs for further production, used in investment, exported or consumed by households and the government. Industry costs include the cost of intermediates, margins, taxes and primary factor costs for labour, land and capital.

The database has been sourced initially from Statistics New Zealand's 2007 Inter-Industry tables. We calibrate the database to 2014 levels using Statistics New Zealand's latest macroeconomic data.

To provide a baseline against which to compare the effects of building and operating QCC, we project the model out to 2020 using NZIER's *Quarterly Predictions* macroeconomic forecasts.

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[6] The regions in the model are: Northland, Auckland, Waikato, Bay of Plenty, Gisborne, Hawkes Bay, Taranaki, Manawatu-Wanganui, Wellington, Tasman-Nelson, Marlborough, West Coast, Canterbury, Otago, Southland.

In this report, we use Otago as our regional economy, but for ease of reference, we refer to Queenstown when discussing the regional results.

[7] Non-accelerating inflation rate of unemployment.

Once we have calibrated the model and developed a baseline in which all markets are in equilibrium and all resources employed[8], we then 'shock' key parameters to simulate the effects of building and operating QCC.

[8] As a result of this assumption, we cannot easily take into account seasonality or spare capacity in the tourism and construction sectors.

3. Scenario development

There are three key shocks to consider:

- Constructing QCC
- Improving surrounding infrastructure, such as parking facilities, footpaths, water supply and sewerage systems, and upgrades to telecommunication, gas and power lines to service the centre.
- The spending of conference attendees, covering:
  - Spending from international attendees, both during the conferences and before/after
  - Spending of domestic attendees.

The spending shock requires careful thought in designing the appropriate simulations for the CGE model at the regional and national levels, as discussed below.

3.1. Construction

Initial estimates by Horwath HTL (2012) suggest that the QCC will cost $43.7 million to build—i.e., $41.6 million for construction and other payments plus $2.1 million for contingencies (Table 1).

More current estimates by Queenstown Lakes Development Council (QLDC) indicate a total cost of $50 million.[9] Using 2012 cost shares, we therefore approximate the current construction cost excluding contingency at $47.6 million.[10]

Table 1 QCC construction cost

$NZ, Millions

Item	2012 ($NZ)	Share (%)	2013 ($NZ)
Construction costs	30.5	70%	34.9
Fixture, fittings and equipment	5.2	12%	5.9
Professional fees@13%	4.6	11%	5.3
Consents @2.5%	0.9	2%	1.0
Network user charges	0.4	1%	0.5
Project contingency	2.1	5%	2.4
Total cost (including contingency)	*43.7*	*100%*	*50.0*
Total cost (excluding contingency)	***41.6***		***47.6***

Note: Detailed 2013 costs were estimated using 2012 cost shares

Sources: Horwath (2012), QLDC (2013), NZIER estimates

[9] Queenstown Lakes District Council [QLDC] council report 19 December 2013.

[10] The contingency is excluded from our analysis as it does not necessarily get spent.

Based on discussions with MBIE, we assume that 60% of the construction costs occur in 2015, and 40% in early 2016.

3.2. Infrastructure

The QLDC also estimates additional infrastructure spending of $1.9 million as a result of the QCC. This relates to infrastructure developments that would not have occurred if QCC was not built, such as:

- Infrastructure improvements leading to the convention centre including parking facilities and footpath improvements
- Water supply and sewerage systems
- Upgrades to telecommunication, gas and power lines to service the QCC.

We apportion this spending equally across 2015 and 2016.

3.3. Visitor spending

3.3.1. Number and type of events

Drawing on Horwath (2012) and further discussions with MBIE, we assume that QCC attracts the following number of events. We assume that operations ramp up in the second half of 2016, albeit at only 50% capacity.

Table 2 Summary of number and type of events

Event type	2016	2017	Average 2018 onwards
Conferences	20	44	47
Banquets	17	40	46
Trade exhibitions	2	3	3
Public Exhibitions	2	3	4
Day meetings	14	31	32
Entertainment	7	16	17
Total	60	137	149

Source: NZIER, based on Horwath and discussions with MBIE officials

These events attract a mixture of international visitors and domestic attendees. We assume that[11]:

- All international conferences are new to New Zealand (i.e. would not have happened elsewhere in New Zealand unless QCC was built)

[11] Assumptions are based on Horwath (2012), NZIER (2011) and discussions with MBIE.

- All domestic conferences are transferred from other regions, or are new and would not have happened at all in QCC's absence. We do not specify where any conferences may have been 'cannibalised' from
- International conferences account for 25 percent of estimated conferences to be held in QCC
- International delegates spend $725 per conference day and $325 in pre/post event activities
- Fifteen percent ($0.9 million) of total international delegates spending ($6.2 million) occurs outside Queenstown (see Appendix A).

3.3.2. National level impacts of visitor spending

At the New Zealand economy level, the only visitor spending that is additional as a result of QCC is the spending of international visitors.

The spending of domestic attendees is all a transfer at the national level. That is, this amount of domestic spending would have happened in the absence of QCC, either at events at other New Zealand conference centres or on other goods and services (or savings).

3.3.3. Regional impacts of visitor spending

There are effectively two regional aspects to consider; Queenstown and the Rest of New Zealand.

For Queenstown, the change in visitor spending is the sum of the following:

- Higher international visitor spending while at the conference
- Higher international visitor spending pre- and post-conference in the region
- Higher domestic visitor spending while at the conference[12].

We do not count spending by Queenstown residents attending events as additional. This is a transfer within the region.

For the Rest of New Zealand, the change in spending is the sum of:

- Higher international visitor spending pre- and post-conference that occurs outside of Queenstown
- Lower domestic spending, as this is redirected towards Queenstown.

So we would expect the result on the Rest of New Zealand to be net negative, unless there is a much larger-than-expected boost from international tourists travelling to other parts of New Zealand before and after their conference in Queenstown.

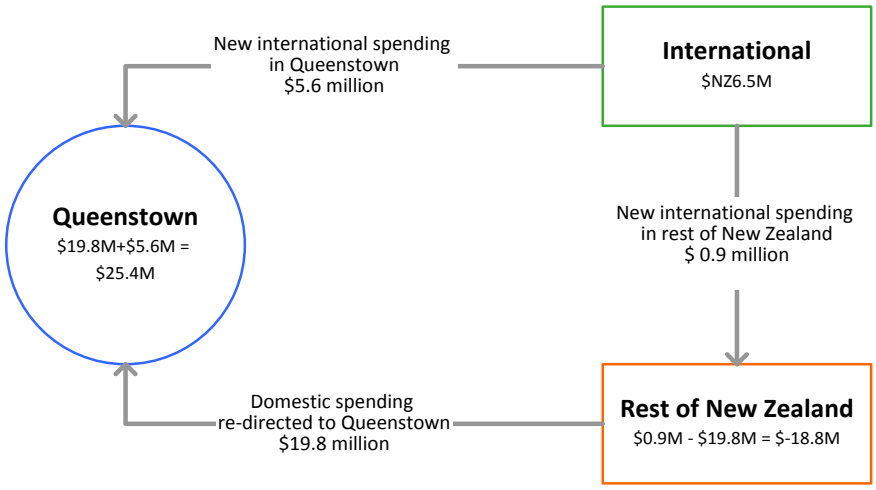
These impacts are summarised in the figure below. More detail of spending by source and event type is shown in Appendix A.

[12] We assume that domestic visitors do not add on extra days pre- or post-conference for additional tourism activities. To the extent this is not true, the New Zealand results will not change, but the Queenstown results might increase slightly, at the expense of the Rest of New Zealand.

In short, QCC boosts Queenstown tourism spending by an average of $25.4 million per year, with the vast majority ($18.8 million) being domestic spending redirected from the rest of New Zealand.

Figure 2 Summary of visitor spending shocks

Average, 2017-2020



Source: NZIER, Horwath (2012)

3.4. Sensitivity analysis

In the limited time available for this work, it was not feasible to carry out numerous simulations that vary all key parameters to check how robust the overall findings are. In our scenario development, the most important driver of the results at a national level is the number of new international events that QCC attracts.

Since the international conference market is highly competitive, and QCC will be competing with the likes of Melbourne, Adelaide and Sydney, for example, we first consider a 'Conservative' scenario where the amount of international visitor spending is 15% lower than in our central scenario.

We also examine an 'Aspirational' scenario where we assume the marketing efforts around QCC are more successful than initially expected, which pushes up international visitor spending by 15% above the central scenario.

The choice of +/- 15% is arbitrary, but could be refined in the future if more detailed analysis of the demand for events is carried out.

4. Results

4.1. Interpreting the results

The CGE technique calculates impacts as changes from a baseline level. Results are then reported as percentage changes from the baseline forecast. Where dollar values are reported they are calculated using the forecast future value of the variable; changes in forecasts will affect those dollar values.

When considering the magnitude of the impacts it should be remembered that the construction of the QCC, while a major investment at a regional level, is small relative to the size of the national economy. With the national economy forecast to approach $250 billion by 2018, the entire $47.3 million cost of construction is less than 0.02% of a year's GDP. We should therefore not expect huge national level changes.

Direct and indirect effects

In analysing the modelling results we track the impacts as they flow through the economy, beginning with the **direct** impacts on the conference sector itself. We then analyse the flow-on or **indirect** impacts. It can aid understanding to split indirect impacts into the following categories:

- **Supplying** industries – industries that supply the tourism sector with intermediate inputs are likely to benefit. Such industries include meal services providers, and business service industries.
- **Household** expenditure industries – industries that households spend money on are likely to benefit from increased income that comes through employment and wages, and increased returns to capital from a growing tourism industry. Such industries include housing and real estate (which takes a large share of households' budgets), and those for consumption goods like the retail trade.
- **Investment** related industries – industries that are used for investment when the conference services industry expands. Typically these revolve around business construction sectors and office related capital.
- **Competing export** industries – industries that suffer from the tourism industry's growth as they compete for resources, which are now more expensive, and also face a stronger New Zealand dollar. Typically these industries are the labour-intensive export industries such as horticulture and manufacturing.

Macroeconomic effects

The national results flow logically from the direct and indirect impacts. We focus on key macroeconomic variables such as employment, Gross Domestic Product (GDP), and compensating variation (CV), which we use as a measure of national economic welfare (how 'well off' we are).

The effect on the Queenstown region is a microcosm of the national results and, similarly, we report changes in gross regional product (GRP) and employment. As we

are unable to calculate CV at the regional level, we use household consumption as our measure of welfare instead.

4.2. Regional results

Construction and infrastructure development phase

During the construction and infrastructure development phase of QCC, the direct effects to Queenstown are higher production and employment.

This additional spending boosts activity in sectors that supply the construction sector, such as construction, construction services, machines and equipment.

The overall regional impact of the construction and infrastructure development phase (from 2015-2016) is that Gross regional product (GRP) rises by $36 million, regional consumption by $46 million, while employment expands by 0.4%.

Operations phase

Once QCC is fully operational, it attracts an additional $25.4 million of international and domestic spending each year.

Supplying industries, such as accommodation, wholesale and retail trade and electricity services expand as a result of the additional tourism activity. Household industries also expand, due to more employment and higher wages. Examples are restaurant services, telecommunications, sports and recreation.

There are some offsetting effects. Other exporters, such as meat, milk, other dairy and clothing become marginally less competitive as the $NZ appreciates following the rise in international tourism spending.

The overall regional impact of the operations phase by 2017 is that, relative to the baseline, GRP cumulatively rises by $65.8 million, consumption by $70 million and employment by 0.7%, or around 120 jobs.[13]

4.3. National results

A similar story pans out at the national level, although as discussed earlier, the size of the shocks is much smaller than at the regional level.

During QCC's construction phase and initial year of operation, the national GDP will increase by 0.01% or $50 million higher than it would otherwise have been without QCC's construction. National economic welfare (as measured by compensating variation) rises by $46 million due to both higher national employment (0.01%) and capital returns (0.03%).

The total impact of the QCC on the national economy, once it is operational, is relatively small, with GDP increasing by an additional $13 million per year. Welfare rises by $5 million additionally while national employment expansion stays 0.01% above baseline forecast in the central scenario.

[13] Assuming that the 0.7% employment growth is applied to Queenstown employment levels as per Business Demographics data for the year ended 2013.

4.4. Sensitivity analysis

When we vary the amount of new international visitor spending by +/- 15%, the results change marginally, as shown in Table 3.

Table 3 Sensitivity analysis on GDP and Consumption

Cumulative change from baseline (year 2017, NZ$ million)

Indicator	Central scenario		Aspirational (+15%)		Conservative (-15%)	
	QT	NZ	QT	NZ	QT	NZ
GDP	65.8	63.6	69.9	64.2	61.6	62.9
Consumption	70.9	52.7	74.1	53.5	67.7	51.8

Source: NZIER

Table 4 Sensitivity analysis on Employment and Real wages

Cumulative % change from baseline

Indicator	Central scenario		Aspirational (+15%)		Conservative (-15%)	
	QT	NZ	QT	NZ	QT	NZ
Employment	0.69	0.011	0.73	0.011	0.64	0.010
Real wages	0.70	0.032	0.74	0.032	0.65	0.031

Source: NZIER

5. Conclusion

The construction and operations of a QCC will have an important impact on the Queenstown regional economy. The regional economy will be $65.8 million larger by the end of 2017 due to its expanded capital stock and boosted exports. The additional tourism spending that the QCC will generate at the regional level will lift employment (around 120 jobs) and wages.

Cumulative national GDP would be $63 million higher while national economic welfare rises by $51 million.

Appendix A Summary of spending by event type

Table 5 Regional tourism shocks

Annual

	Value of new international spending in Queenstown (A)	Value of new domestic spending in Queenstown (B)	Value of new total spending in Queenstown (C) = (A) + (B)
Conferences	5,278,115	12,752,227	18,030,342
Banquets	266,306	3,026,103	3,292,409
Trade exhibitions	15,750	1,047,735	1,063,485
Public Exhibitions	13,125	890,663	903,788
Day meetings		533,520	533,520
Entertainment		1,526,850	1,526,850
Total	**5,573,296**	**19,777,097**	**25,350,393**

Source: NZIER, Horwath (2012)

Table 6 National level tourism shocks[14]

Annual

	Value of new international spending in New Zealand (A)	Value of new international spending in Queenstown (B)	Value of new international spending in rest of NZ (C) = (A) – (B)
Conferences	6,244,531	5,278,115	966,415
Banquets	266,306	266,306	
Trade exhibitions	15,750	15,750	
Public Exhibitions	13,125	13,125	
Total	**6,539,712**	**5,573,296**	**966,415**

Source: NZIER, Horwath (2012)

[14] We assume Day meetings and Entertainment events attract only domestic attendees.