

# New Zealand Tourism Oil Price Risk Assessment Tool

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## 1 Introduction

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In Becken, Nguyen & Schiff (2010) we developed a framework for assessing the economic impacts of higher oil prices on the New Zealand tourism sector. This framework summarises the economic linkages between world oil prices and New Zealand tourism. As part of that framework, we identified the key factors that affect the exposure of individual New Zealand tourism businesses to higher oil prices.

To operationalise the framework, we have created an interactive website at <http://www.covec.co.nz/tourism-oil-price-tool> that allows New Zealand tourism businesses assess their relative exposure to higher oil prices by answering some questions about the characteristics of their business. These characteristics correspond to the factors our research identified as important for determining the impact of permanently higher world oil prices on the profitability of a tourism business.

Based on the responses entered, the website calculates an assessment of the risks faced by an individual business and summarises the risks in the form of two risk scores. These scores represent (i) the risk that is driven by changes in tourist behaviour in response to higher oil prices, and (ii) the risk that is driven by changes in business costs and the ability of the business to adapt to higher oil prices. The following section explains in detail how these two scores are calculated.

## 2 Risk Assessment Methodology

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Our research identified the following factors as determining the profit risk faced by a New Zealand tourism business due to higher world oil prices:

1. **Tourist origin:** The mix of countries that the business's customers come from.
2. **Tourist purpose:** The split of business's customers between business and non-business travel.
3. **Tourist travel style:** The split of business's customers between independent travellers and tour groups.
4. **Remoteness:** The distance of the business from the 'main tourist route' typically visited by tourists in New Zealand.

5. **Dependence on fossil fuels:** The importance of fossil fuels, particularly oil and oil derivatives such as petrol and diesel fuel, as a source of energy for the business.
6. **Oil substitution options:** The ease with which the business can substitute to alternative (non-oil based) energy sources.
7. **Number of competitors:** The intensity with which a tourism business competes against rivals.

The risk assessment tool classifies these seven risk factors into two categories – (i) risks associated with customer behaviour, and (ii) risks associated with business costs and the ability of the business to adapt to higher oil prices. A risk score is calculated for each of these two categories as a weighted average of scores calculated for each of the factors in that category. Table 1 shows the classification of factors into the two categories and the weight assigned to each factor in calculating the score for that category.

Table 1 Classification of determinants of risk and weighting.

| <b>Customer risk factors</b> |               | <b>Cost risk factors</b>   |               |
|------------------------------|---------------|----------------------------|---------------|
| <b>Factor</b>                | <b>Weight</b> | <b>Factor</b>              | <b>Weight</b> |
| Tourist origin               | 0.40          | Dependence on fossil fuels | 0.30          |
| Tourist purpose              | 0.25          | Oil substitution options   | 0.30          |
| Tourist travel style         | 0.25          | Number of competitors      | 0.30          |
| Remoteness                   | 0.10          | Remoteness                 | 0.10          |

The tourist characteristics (origin, purpose and travel style) determine the sensitivity of demand to higher prices that may result from higher oil prices. In addition, different countries will experience different macroeconomic effects as a result of higher oil prices. Therefore, origin is especially important for determining the customer-related risk and accordingly it is assigned a higher weight when calculating the customer risk score.

Our research also showed that remoteness is not a highly important factor in determining tourists' responses to higher oil prices and it therefore receives a lower weight. Remoteness also appears as a cost risk factor because more remote locations will experience higher transport costs of being supplied, which will increase when oil prices increase.

To calculate risk scores for the two categories, each of the seven factors was further broken down into a number of specific determinants of risk, and a score from 1 to 9 was assigned to each. The breakdown of the factors and the scores assigned are shown in Table 2. A score of 1 represents relatively low risk and a score of 9 represents relatively high risk. These scores were assigned based on the findings from our research, as explained in detail in Becken, Nguyen & Schiff (2010).

Table 2 Risk score assignments to risk factors.

| <b>Customer risk factors</b>              |              | <b>Cost risk factors</b>                  |              |
|---|--------------|---|--------------|
| <b>Factor</b>                             | <b>Score</b> | <b>Factor</b>                             | <b>Score</b> |
| <b>Tourist origin</b>                     |              | <b>Dependence on fossil fuels</b>         |              |
| New Zealand residents (%)                 | 1            | 0 – 5% of costs                           | 1            |
| Australia (%)                             | 3            | 6 – 10% of costs                          | 3            |
| North America (%)                         | 5            | 10 – 15% of costs                         | 5            |
| Asia (%)                                  | 9            | 15 – 20% of costs                         | 7            |
| UK & Europe (%)                           | 7            | More than 20% of costs                    | 9            |
| Other International (%)                   | 4            | <b>Oil substitution options</b>           |              |
| <b>Tourist purpose</b>                    |              | Easy                                      | 1            |
| Holiday & VFR (%)                         | 6            | Moderate                                  | 5            |
| Business (%)                              | 2            | Difficult                                 | 9            |
| <b>Tourist travel style</b>               |              | <b>Number of competitors</b>              |              |
| Independent traveller (%)                 | 2            | 0 – 2                                     | 1            |
| Tour group (%)                            | 6            | 3 – 5                                     | 5            |
| <b>Remoteness from main tourist route</b> |              | More than 5                               | 9            |
| Less than 50 km                           | 1            | <b>Remoteness from main tourist route</b> |              |
| 50 – 100 km                               | 5            | Less than 50 km                           | 1            |
| More than 100 km                          | 9            | 50 – 100 km                               | 5            |
|   |              | More than 100 km                          | 9            |

Based on the responses to the relevant questions, the customer risk score and cost risk score are calculated using the weights in Table 1 and the scores in Table 2.

For the factors where a percentage distribution is entered (indicated by a (%) in Table 2), the percentages are multiplied by the scores in Table 2 to calculate a weighted average score for that factor. For example, a business with 60% holiday and VFR customers and 40% business customers receives a score of  $0.6 \times 6 + 0.4 \times 2 = 4.4$  for the 'tourist purpose' factor.

For the other factors where only one response is chosen, the score for the factor is simply the score assigned to the selected response. For example, a business with 3 – 5 competitors receives a score of 5 for the 'number of competitors' factor.

To further illustrate the methodology, Table 3 shows an example of the risk score calculations for a hypothetical tourism business. The responses entered by the business are shown in the 'input' columns. These inputs and the scores for each factor from Table 2 are used to calculate the 'weighted score' column. The total score for each factor is multiplied by the weights shown in red (corresponding to the weights in Table 1), and these weighted factor scores are added to calculate the total scores shown at the bottom of the table.

Table 3 Example risk score calculation.

| Customer risk factors                     |       |                   | Cost risk factors                         |       |                   |
|---|-------|-------------------|---|-------|-------------------|
| Factor                                    | Input | Weighted Score    | Factor                                    | Input | Weighted Score    |
| <b>Tourist origin</b>                     |       |                   | <b>Dependence on fossil fuels</b>         |       |                   |
| New Zealand residents (%)                 | 20    | 0.2               | 0 – 5% of costs                           | ✘     | 0.0               |
| Australia (%)                             | 30    | 0.9               | 6 – 10% of costs                          | ✓     | 3.0               |
| North America (%)                         | 10    | 0.5               | 10 – 15% of costs                         | ✘     | 0.0               |
| Asia (%)                                  | 20    | 1.8               | 15 – 20% of costs                         | ✘     | 0.0               |
| UK & Europe (%)                           | 20    | 1.4               | More than 20% of costs                    | ✘     | 0.0               |
| Other International (%)                   | 0     | 0.0               | <b>Total</b>                              |       | <b>3.0 x 0.30</b> |
| <b>Total</b>                              |       | <b>4.8 x 0.40</b> | <b>Oil substitution options</b>           |       |                   |
| <b>Tourist purpose</b>                    |       |                   | Easy                                      |       |                   |
| Holiday & VFR (%)                         | 70    | 4.2               |   | ✘     | 0.0               |
| Business (%)                              | 30    | 0.6               | Moderate                                  | ✘     | 0.0               |
| <b>Total</b>                              |       | <b>4.8 x 0.25</b> | Difficult                                 | ✓     | 9.0               |
| <b>Tourist travel style</b>               |       |                   | <b>Total</b>                              |       | <b>9.0 x 0.30</b> |
| Independent traveller (%)                 | 40    | 0.8               | <b>Number of competitors</b>              |       |                   |
| Tour group (%)                            | 60    | 3.6               | 0 – 2                                     | ✘     | 0.0               |
| <b>Total</b>                              |       | <b>4.4 x 0.25</b> | 3 – 5                                     | ✘     | 0.0               |
| <b>Remoteness from main tourist route</b> |       |                   | More than 5                               | ✓     | 9.0               |
| Less than 50 km                           | ✘     | 0.0               | <b>Total</b>                              |       | <b>9.0 x 0.30</b> |
| 50 – 100 km                               | ✓     | 5.0               | <b>Remoteness from main tourist route</b> |       |                   |
| More than 100 km                          | ✘     | 0.0               | Less than 50 km                           | ✘     | 0.0               |
| <b>Total</b>                              |       | <b>5.0 x 0.10</b> | 50 – 100 km                               | ✓     | 5.0               |
|   |       |                   | More than 100 km                          | ✘     | 0.0               |
|   |       |                   | <b>Total</b>                              |       | <b>5.0 x 0.10</b> |
| <b>Customer risk score</b>                |       | <b>4.72</b>       | <b>Cost risk score</b>                    |       | <b>6.80</b>       |

The two scores are rounded to the nearest whole number to present the final results. For example, in Table 3 the customer risk score is rounded to 5 and the cost risk score is rounded to 7. Scores of 1 – 3 are classified as ‘low’ risk, scores of 4 – 6 are classified as ‘medium’ risk and scores of 7 – 9 are classified as ‘high’ risk.

### 3 References

Becken, S., M. Nguyen & A. Schiff (2010). Impacts of Oil Price on New Zealand Tourism: An Economic Framework. *LEaP Report No. 12*, available at [http://researcharchive.lincoln.ac.nz/dspace/bitstream/10182/1379/1/LEaP\\_rr\\_12.pdf](http://researcharchive.lincoln.ac.nz/dspace/bitstream/10182/1379/1/LEaP_rr_12.pdf)