

TOURISM'S EXPOSURE TO GLOBAL OIL PRICE

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ABSTRACT

Tourism is an important sector contributing 19% to New Zealand's export revenue. At the same time, tourism is extremely dependent on oil for both travel to and within New Zealand. While forecasts for future tourism growth are generally optimistic, they fail to take into account potential changes in global oil price and effects on arrival numbers. It might be timely to consider how tourism might change given incremental or rapid increases in oil price. This research will develop a Tourism Sector Model that allows investors, operators and policy makers to assess such changes and develop adaptation measures for mitigating associated risks. To this end, a five-step methodology will be presented in this paper. Ultimately, the research seeks to answer how travel behaviour will change under various oil price scenarios, what types of tourists, products and destinations are most at risk, and what adaptation measures could be put in place to manage those risks.

KEY WORDS: Oil price, vulnerability, market segments, consumption bundles

INTRODUCTION

Recent research has clearly demonstrated that tourism is dependent on the availability of oil (Gössling *et al.*, 2005, Peeters *et al.*, 2006, Scott *et al.*, 2007; Becken, in press). Growth forecasts for tourism are optimistic (e.g. UNWTO, 2001), but they do not seem to take into account changes in global oil price. Only one study so far applied scenario analysis to investigate the implications of reduced oil availability for tourism in Scotland (Yeoman *et al.*, 2007). More recently, climate change has come to the forefront of discussions and activities, including in the tourism sector. Addressing climate change involves, among others, to reduce energy consumption and greenhouse gas emissions. Even in this debate, very little is being said about energy security and Peak Oil.

Where the Bloody Hell Are We?

While there is considerable debate about the point of time when oil production might ‘peak’, there is little doubt that it will reach a maximum at some point (e.g. Campbell & Laherrère, 1998; Hutter, 2006), given that fossil fuel is a finite resource. Some authors believe that a peak in production has already occurred (Energy Watch Group, 2007). At the same time, demand for oil is predicted to increase at a rate of an average 1.6% between now and 2030 (International Energy Agency (IEA), 2006). When demand increases and production decreases, prices for oil would increase rapidly. In the past, price changes have largely been related to political events (see Figure 1).

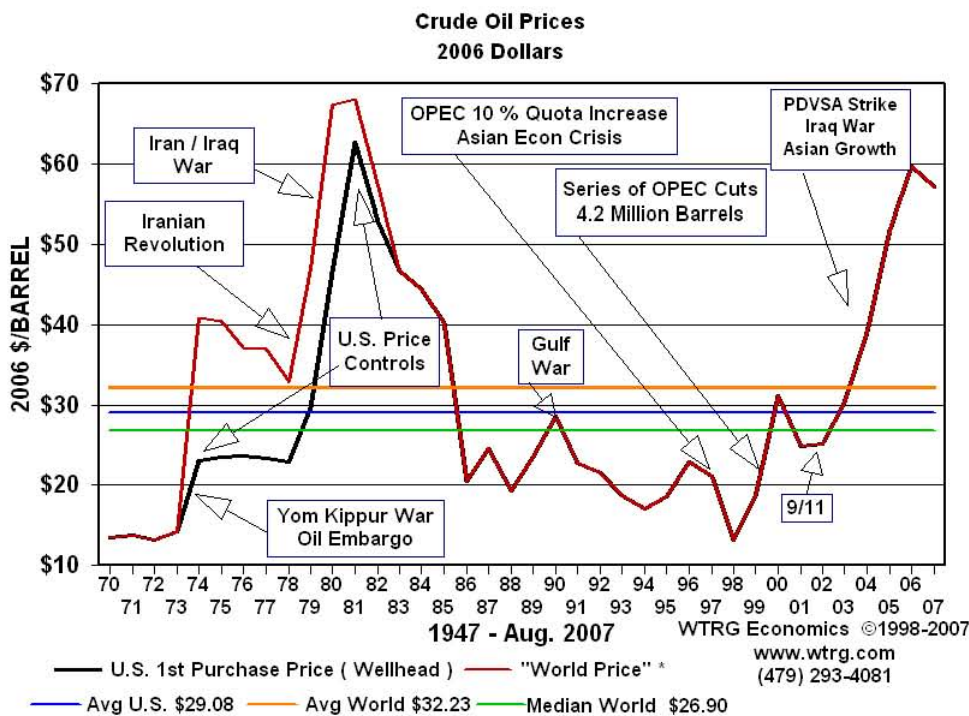


Figure 1 Crude Oil Prices in 2006 Dollars (Source: <http://www.wtrg.com>)

Currently, fossil fuels are essential for all conventional tourism transport. Most recently, Scott et al. (2007) estimated that globally 68% of tourism’s CO₂ emissions are due to the combustion of fuel for tourism transport. Clearly, given this fuel-intensity of tourism transport, oil price increases will have implications for some destinations. Responses by tourists will not be uniform, as price elasticity (mostly studied for air travel) differs between market segments. Holiday travellers appear to be most price sensitive (Gillen et al., 2004). Oil prices will not only affect tourists’ decision making in relation to where to go, but also how (and how much) they travel at the destination.

This three-year research programme will develop a Tourism Sector Model to assess the vulnerability of tourism in New Zealand to global oil prices. In other parts of the wider

research programme, this Sector Model will be linked to an International Arrivals Model and integrated into a General Equilibrium Model.

METHODOLOGY AND PRELIMINARY RESULTS

The research methodology comprises four steps, namely i) identification of appropriate market segments, ii) analysis of “consumption bundle” for each segment, iii) identification of prices in each consumption bundle, iv) analysis of pricing responses to changing oil prices, and v) elasticity estimates. Each of these steps will be discussed in more detail below. The International Visitor Survey (IVS) from the Ministry of Tourism is used to analyse tourist data in the first instance. At a later stage additional data collection will be necessary.

Segmentation

An initial segmentation has been based on three key descriptive variables, namely tourist origin, travel purpose and style (packaged or independent). The reason behind this segmentation is that it can be linked with other dimensions that depend on country of origin, such as prices of airfares, exchange rates and marketing budgets. These variables will be important in relation to elasticities, overall arrivals and travel behaviour. Similarly, earlier research has shown that purpose of travel is a significant determinant of price elasticity in relation to airfares (Brons et al., 2002). Travel purpose is also relevant to marketing, as most campaigns are targeted at holiday visitors. Finally, travel style is important, because it influences the ‘consumption bundle’ (nature and price), the way in which price changes of both airfare and in-country component are perceived by tourists, and the range of potential responses available to tourists. For example, independent travellers have more choices to reduce their vulnerability to higher oil prices than package tourists do.

Consequently, the IVS data were recoded to form segments that combine origin, purpose and style and the largest segments in terms of volume between 1997 and 2006 were included in the analysis. In addition, three segments from China were added for strategic reasons (Table 1). Overall, 73.5% of international tourists are therefore captured in the segments. A range of ANOVA tests were undertaken on key variables such as length of stay and total expenditure to assess that the segments are different at statistically significant level. Moreover, a range of t-tests were carried out to assess pairwise differences within each country of origin.

Table 1 Market segments and their importance across the years 1997 to 2006

Origin	Purpose/style	Number of tourists (1997-2006)	Market share in %
Australia	Holiday FIT	1,849,682	10.5
	VFR FIT	1,746,902	9.9
	Holiday Tour group	485,882	3.8
	OTHER	1,802,895	0.6
UK	Holiday FIT	1,139,187	6.4
	VFR FIT	611,236	3.5
	OTHER	343,593	1.9
USA	Holiday FIT	843,146	4.8
	Holiday Tour group	383,133	2.2
	OTHER	542,315	1.4
Japan	Holiday Tour group	683,408	3.9
	Holiday FIT	384,578	1.1
	OTHER	424,813	2.4
Germany	Holiday FIT	326,785	1.8
	OTHER	159,959	0.9
Korea	Holiday Tour group	310,539	1.8
	OTHER	433,059	2.5
China	Holiday Tour group	164,906	0.9
	VFR FIT	85,368	0.5
	OTHER	260,067	1.5
Remaining	-	4,687,387	26.5
TOTAL	-	17,668,841	100.0

Consumption bundles

Each of the above segments is characterised by the consumption of goods and services from the transport, accommodation, hospitality, attraction/activity and retail sectors. Transport consumption can be best measures in kilometres travelled by different travel modes, as this relates closely to the likely requirements in fuel. For the 2006 data, for example, it can be seen that independent holiday travellers (from the UK, USA and Germany in particular) travel more than other segments. Air travel is particular prominent amongst American and Japanese holiday package tourists (Figure 2).

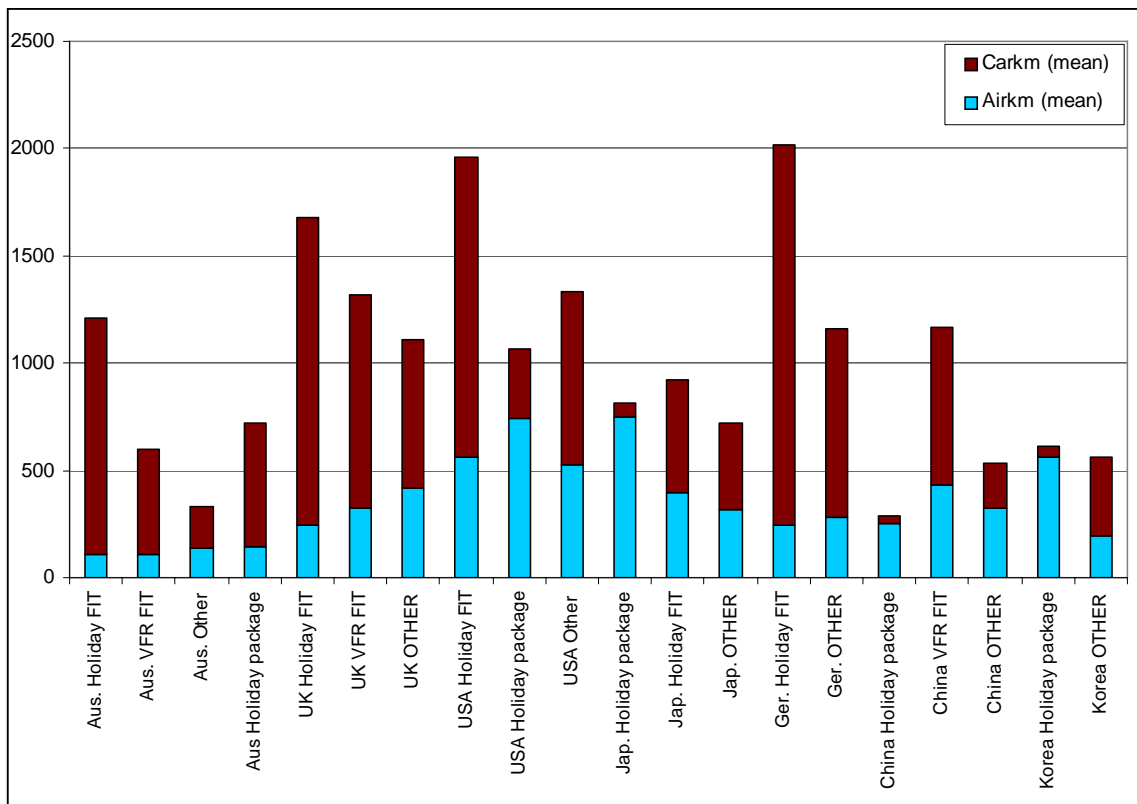


Figure 2 Distance travelled per tourists by car or air for market segments in 2006.

Price of consumption bundle

The expenditure data in the IVS are sketchy and unreliable, and complicated by the fact that tourists spend money before they enter New Zealand (either as part of a package or not) as well as in New Zealand. For some expenditure categories, the IVS data require substantial testing and enhancement, and for some categories external data will be required to identify prices. For example, accommodation and attraction data will be collected from businesses directly and then assigned to the segments depending on their consumption patterns. Transport costs will be derived via distance travelled, oil prices at the time and other transport costs (e.g. rental vehicle).

In the case of buying souvenirs and having meals, however, the IVS data seems reasonably robust (e.g. in terms of sample size) and alternative data would be difficult to obtain. Figure 3 shows the spending patterns by market segment for ‘souvenirs’ and ‘meals’ in New Zealand.

Where the Bloody Hell Are We?

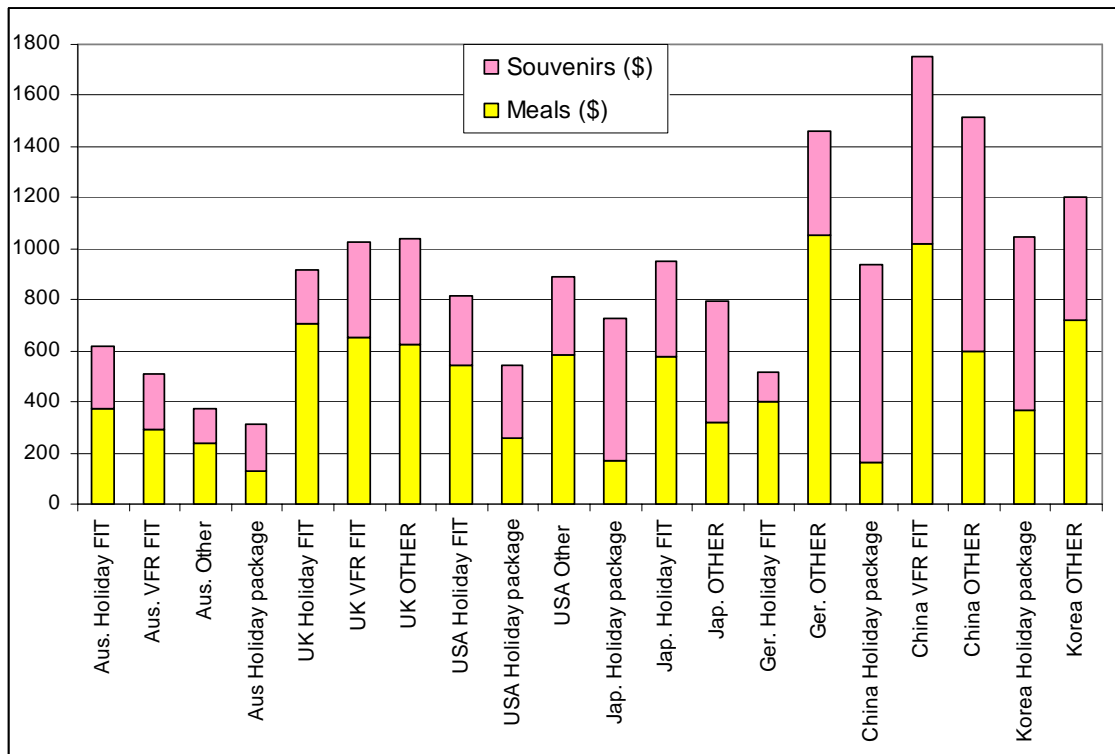
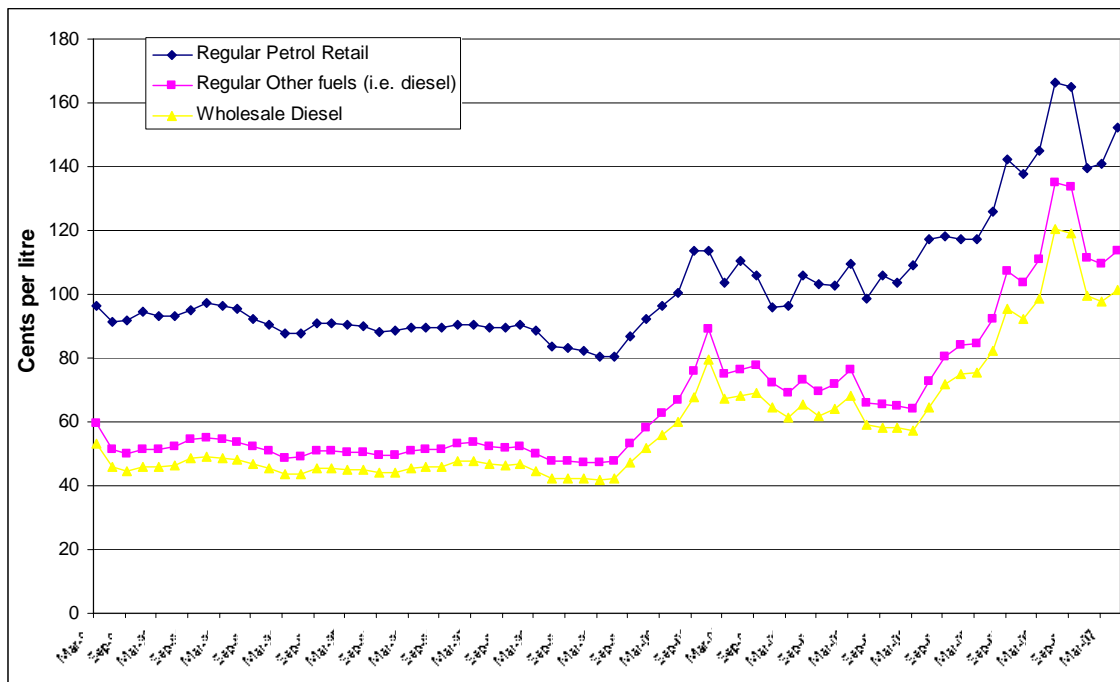


Figure 3 Expenditure per tourist by segment for souvenirs and meals in 2006.

Changing oil prices

Energy is a key input into the production process and in some cases it can amount to a substantial proportion of operating costs, for example in the range of 30% for airlines (Hanlon, 2007) and 5-15% for other tourism businesses (Becken et al., 2006). For transport operations, energy is closely linked to the supply of oil in the form of petrol or diesel, while built attractions and accommodation rely more on electricity. The links between global oil prices and electricity are more indirect in nature. Oil prices have changed substantially in New Zealand in the last few years (Figure 4), and some sectors have already responded, for example in the form of a fuel surcharge.



OUTLOOK

The analysis of the consumption bundles of different market segments and their sensitivity allows identification of markets most at-risk. The preliminary analysis shows that the long-haul holiday independent travellers might be most at risk in terms of exposure to higher oil prices. This research will also reveal which components of the New Zealand tourism are most at-risk. Vulnerability analyses (analogous to those undertaken in climate change impact analyses, e.g. Fussel, 2007) that cover exposure, sensitivity and adaptive capacity will be undertaken for key products. For example, an activity such as (non-sailing) boat trips is exposed to oil prices because oil would be a large proportion of its operating costs. It could be considered sensitive if its key markets demonstrate high price elasticity of demand. Adaptive capacity depends on the individual operator and its potential for technological improvements or substituting activities (or markets).

This research programme has an Advisory Board that consists of a range of industry members and Government agencies. A close partnership with the Ministry of Tourism has been established, as well. Communication of results and input into the modelling by stakeholders are important elements of this research.

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REFERENCES

- Becken, S., Marquardt, M. & McKenzie, S. (2006). Energy Use and Greenhouse Gas Emissions of small to Medium-sized Tourism Businesses: a Case-Study Approach. Landcare Research Internal Report.
- Becken, S. (in press). Indicators for managing tourism in the face of peak oil. *Tourism Management*.
- Brons, M., Pels, E., Nijkamp, P. & Rietveld, P. (2002). Price elasticities of demand for passenger air travel: a meta-analysis. *Journal of Air Transport Management*, 8, 165-175.
- Campbell, C. J. & Laherrère, J. H. (1998). The end of cheap oil. *Scientific American*, March, 60-65.
- Energy Watch Group (2007). Crude Oil. The Supply Outlook. EWG-Series No 3/2007. Available at (20/11/07)

- Füssel, H. M. (2007). Vulnerability: a generally applicable conceptual framework for climate change research. *Global Environmental Change*, 17, 155-167.
- Gillen, D. W., Morrison, W. G. & Stewart, C. (2004). *Air Travel Demand Elasticities: Concepts, Issues and Measurement*. Final report. Department of Finance Canada. Available at (20/11/06) http://www.fin.gc.ca/consultresp/Airtravel/airtravStdy_e.html
- Gössling, S., Peeters, P., Ceron, J.P., Dubois, G., Patterson, T. & Richardson, R. (2005). The eco-efficiency of tourism. *Ecological Economics*, 54 (4), 417-434.
- Hanlon, P. (2007). *Global airlines. Competition in a transnational industry*. Third edition. Oxford: Butterworth-Heinemann.
- Hutter, F. (2006). *TrendLines Peak Oil Depletion Scenarios 2006*. Available at (15/11/06) <http://www.trendlines.ca/economic.htm>
- International Energy Agency (2006). *World Energy Outlook*. OECD. Paris.
- Peeters, P., Gössling, S. & Becken, S. (2006). Innovation towards tourism sustainability: climate change and aviation. *Special Issue International Journal of Innovation and Sustainable Development*, 1 (3), 184 – 200.
- Scott, D., Amelung, B., Becken, S., Ceron, J.P., Dubois, G., Goessling, S., Peeters, P. & Simpson, M. (2007). *Climate Change and Tourism: Responding to Global Challenges*. Madrid/Paris: United Nations World Tourism Organisation and United Nations Environment Programme.
- United Nations World Tourism Organisation (2001). *Tourism 2020 Vision*. Madrid, World Tourism Organization.
- Yeoman, I., Lennon, J. J., Blake, A., Galt, M., Greenwood, C. & McMahon-Beattie, U. (2007). Oil depletion: What does this mean for Scottish tourism? *Tourism Management*, 28 (5), 1354-1365.