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Environmental Regulations and the International Competitiveness of Australia's Tourism Industry - A Case Study of Far North Queensland¹

Twan Huybers, Arlene Rutherford and Jeff Bennett²

ABSTRACT

The international competitiveness of an industry is determined by its ability to sell goods and services of higher quality and/or at lower cost than its competitors. Therefore, issues relating to international competitiveness can be conceptualised through their impact on sustained industry profitability. Using this framework, an index of international competitiveness is developed in this paper. The index is then applied to the tourism industry using a case study where the industry's international competitiveness is largely dependent on natural environment related attributes and associated regulations. Complying with regulations can reduce competitiveness because of increases in the costs faced by the industry relative to competitors unaffected by regulations. However, it is also shown that compliance with regulations can also enhance the quality of natural environment related attributes - thus increasing industry revenue. Hence the impact of environmental regulations on international competitiveness depends on the outcome of these two opposing forces on industry profitability.

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² All correspondence can be addressed to Mr Twan Huybers, Dr Arlene Rutherford or Associate Professor Jeff Bennett, School of Economics and Management, University of New South Wales, Australian Defence Force Academy, Campbell ACT 2600.

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1. Introduction

Tourism from domestic and overseas visitors contributes 11% to Australia's gross domestic product annually (DFAT 1996). In 1996, Australian tourism export earnings were over \$13,000 million or approximately 12.6 % of total Australian export earnings (ABS). This represents a significant increase from 7.5% in 1986.³ These export earnings were also approximately four times the individual export earnings of meat, wool and wheat and 1.5 times the Australia's export earnings from coal (ABS). Whilst domestic tourism is still predominant in the Australian tourism industry, inbound tourism has been growing at a much faster rate (ABS, BTR). From 1987 to 1994, the annual number of overseas tourists (visitor arrivals) has more than doubled - equating to one foreign tourist per five Australian residents. In 1985, the majority of Australia's overseas visitors originated from New Zealand (21%), the USA (17%) and the UK (14%). However, since 1990, the majority of Australia's overseas visitors originated from Japan (averaging 22% from 1990 to 1994) and other Asian countries (increasing from 14% to 23% from 1985 to 1994).

Attributes related to the natural environment are the major drawbacks for Australia's tourism industry (Huybers and Bennett 1996; Tourism Council Australia 1990). Consequently, the links between the tourism industry and the environment upon which it impacts (in potentially positive and negative ways) are direct. This feature coupled with the rapid growth of Australia's tourism industry and its location-specific and seasonal nature necessitates a greater understanding of the relationships between Australia's tourism industry and the environment - particularly in the development and implementation of environmental regulations (Forsyth and Dwyer 1996; Department of Tourism 1994, 1992; Tourism Council of Australia 1990).

A measure of the impact of proposed environmental policies on the international competitiveness of Australia's tourism industry at a microeconomic level would be a useful decision making aid (Hitchens et al. 1992). Such a measure would also have wider application to other Australian industries where government environmental regulation and other factors affect international competitiveness. One way of measuring impacts on competitiveness is through the development of a quantitative index of competitiveness. In developing such a quantitative index for use in the tourism industry, a theoretical analysis of the concept of international industry competitiveness and means of measurement was initially undertaken. As a result, an index was developed and tested for its theoretical consistency and practical feasibility using Far North Queensland tourism as a case study. In the next section, a brief overview of the theoretical background to the notion of competitiveness is presented. This is followed by a discussion of environmental regulation and its possible effects on international competitiveness. Section four gives a summary of existing competitiveness indicators and outlines the index used in this study. In section five, an overview of the case study and its results are presented. Finally, the implications for further testing and index development are discussed.

³ Total national expenditure for the industry was over \$43,000 million in 1996 with the industry employing 500,000 to 600,000 people or 6.6% of the workforce.

2. Comparative Advantage, Competitive Advantage and International Competitiveness

Driven by technological advancements in transport and communication, national economies are becoming increasingly integrated - a phenomenon encapsulated by the term "globalisation". An important consequence of globalisation is increased foreign competition - in both final and intermediate goods and services markets (Falconer and Sauve 1996; Rutherford 1996). The benefits which may be realised as a result of increased foreign competition include a faster pace of domestic economic change and increased productivity - resulting from competitive pressures to stay in business as well as improved opportunities to learn new technologies and management practices. The extent to which such opportunities can be translated into improved international competitiveness depends, to some degree, on the adaptive capacity of economies which may be enhanced or stifled by various regulatory institutions (Traxler and Unger 1994).

The traditional notion of international competitiveness in economic theory has centred on the theory of comparative advantage and opportunity cost. However, in an increasingly competitive environment, how a nation's resources are created and utilised is of equal, if not more, importance than a nation's exploitation of its inherited resource endowment to the economic prosperity the nation (Thurow 1994; Petit and Gnaegy 1994; Rutherford 1994; Krugman 1991; Porter 1990). This literature explicitly recognises that the firms which operate in a nation determine the competitiveness of that nation and are also dependent upon a number of characteristics of that nation for their competitiveness. In addition, more emphasis has been given to the temporal aspects of competitiveness and varying market structures i.e. competitiveness for firms in a perfectly competitive environment will be different to competitiveness in a monopolistic market structure.

Shortcomings in the ability of traditional economic trade theory to explain "non-comparative advantage" based trends, such as intra-industry trade and the existence of multinational companies, has led to the recent development of "new international trade theory".⁴ As a result of the successive relaxation of a number of the restrictive assumptions embodied in the traditional theory (i.e. the existence of perfect competition, the absence of technical progress or innovation, the absence of production as a process and the immobility of production factors), more of the "richness" of competition has been encapsulated and more of the modern paradoxes explained (Sachwald 1994).

Literature in the field of international competitiveness concentrates on evidence gathered in manufacturing industries with little or no attention given to agricultural or service industries. In this paper, this gap is filled by focussing on a particular Australian service industry - tourism. Australia's tourism industry operates in an increasingly globally competitive environment. For example, the Great Barrier Reef is in direct

⁴ Traxler, da Silva and Pitts (1994) review definitions and measures of competitiveness with emphasis on multinationals.

competition with destinations like Vanuatu, the Solomon Island, Fiji, Bali and Hawaii. The tourism product is, however, by no means a homogeneous product whose competitiveness is solely based on relative prices. Being able to offer a low-priced product - because of low costs of production - does not guarantee sustained competitiveness if the overall quality of the other product characteristics is not sufficient to create demand. Hence, international competitiveness is based on an industry's ability to sell goods and services of higher quality and/or at a lower cost than its competitors, leading to sustained industry profitability.

3. Environmental regulation and international competitiveness

Governments are often involved in the regulation of the use of environmental resources. The rationale for government regulation and its subsequent effects on the international competitiveness of affected firms will be discussed below. There are, however, circumstances under which voluntary self-regulation of environmental use by businesses occurs. Voluntary environmental protection and enhancement may be a rational business strategy that yields financial rewards and improved competitiveness. Gallarotti (1995) argues that many opportunities exist for managers to profit from environmentally sound strategies that are independent of public pressures - refuting the traditional view of "environmental drag" on business (Sanchez and McKinley 1995). Sorsa (1994) also contends that, "contrary to common perceptions, higher environmental standards in industrial countries have not tended to lower their international competitiveness".

Opportunities for cost reduction have had a reinforcing effect on the voluntary adoption of environmentally sound strategies by firms and industries. Examples include low-bulk production and packaging, limiting the use of energy and raw materials, recycling and reusing energy and materials, substituting non-hazardous material for hazardous ones and maximising containment and improving quality control and by-product use. Pro-environment strategies may also enhance managerial and organisational skills by encouraging familiarity with all operations of a company and industry links.

On the demand side, markets may be better penetrated, maintained and even dominated as a result of "environmental product differentiation" rather than purely price based product competition. This may be particularly true for "early movers" who act to implement such strategies prior to official government intervention (Stevens 1993). For example, Gallarotti (1995) quotes numerous market studies which "overwhelmingly show that consumer preferences have shifted toward environmentally sound products (and concomitantly away from environmentally unsound products), and that this shift is neither ephemeral nor faddish". Successfully implemented product differentiation not only makes environmentally sound products more price inelastic, it can make entry into an industry by potential competitors more difficult and earn a company exclusive rents while others are catching up - particularly in terms of

obtaining consumer loyalty (Sanchez and McKinley 1995; Sorsa 1994; Hitchens et al. 1992).⁵

Self-regulation is also possible at the industry level. For example, the Tourism Council of Australia (TCA) - Australia's peak tourism industry body - in consultation with environmentalists, government officials and tourism industry representatives, established environmental guidelines for tourist developments to "demonstrate to the industry that good environmental management equals good general management and is necessary for the long term viability of the Australian tourism industry" (TCA 1990).

Despite the possibility of private incentives for self-regulation of environmental resource use, voluntary actions alone cannot always be relied upon. Government intervention may be justified when an environmental resource is shared by more firms. An example with respect to tourism is the case where operators commonly use a forest or a beach in their operations. Unless there is an agreement between the operators, there is little incentive for individual operators to moderate their impact on the resource since they know that this will not necessarily be matched by their competitors. In this case, there is a rationale for the government to introduce environmental regulations (e.g. operator permits or environmental management fees) to reach the common goal of forest or beach maintenance.

Government intervention may also be justified in the case of externalities, the situation wherein a decision is made on the basis of the cost to the decision maker only without consideration of the total social cost involved. An example regarding tourism is the case where an operator's waste disposal pollutes the local beaches and creates inconvenience to, e.g., the local fishing industry. This may induce the government to impose waste disposal regulations with the aim of changing the operator's behaviour.

However, the complexity of regulation, delays in decision making by authorities and uncertainty regarding future regulations are cited as the major regulatory related problems by tourism operators in the Australian tourism industry (Huybers and Bennett 1996). Therefore, there would appear to be a tradeoff between government imposed environment protection and the structural rigidities and inefficiencies that result from government regulation (Traxler and Unger 1994).

In this paper, the impacts of government imposed environmental regulations on international competitiveness of Australia's tourism industry are investigated. These impacts may be conceptualised through a simple market model of supply and demand curves. Sustained or improved environmental protection as a result of government regulation may enhance the attractiveness of the industry, e.g. through an enhanced reputation as a "green" destination. This represents an upward shift of the demand curve. However, environmental compliance costs cause the supply curve to shift

⁵ Porter (1990) described product differentiation as one of several generic strategies that businesses use to gain a sustainable competitive advantage in product or service markets. Sectors which have more difficulty in gaining a competitive advantage from product differentiation include primary agricultural and resource-based commodities such as minerals. Structural competitiveness has been coined to summarise such non-price determinants of competitiveness (Sachwald 1994).

upward as well.⁶ The net impact on the industry depends on the relative magnitudes of the shifts in the curves.⁷ The industry could benefit from the regulation if a relatively small shift of the supply curve would be more than offset by a relatively large shift of the demand curve. In the next section it will be shown how the various determinants for the shifts in both demand and supply curves are incorporated in an index of competitiveness.

4. Indicators of international competitiveness

A survey of the literature revealed many different indicators of international competitiveness (including measures of competitive advantage and comparative advantage). No single measure developed has been capable of capturing all of the information on the factors determining competitiveness at any level. All of these indicators can be grouped on the basis of the level at which international competitiveness is being considered (ie. country, industry, sector or firm), the factors considered and the type of data gathered (including quantitative and/or qualitative information). For example, competitiveness at the country level, may be defined as the ability to sustain, in a global economy, an acceptable growth in the real living standards of the population with an acceptably fair distribution, while efficiently providing employment for substantially all who can and wish to work and doing so without reducing the growth potential in the standard of living of future generations (Hickman, 1992).

The most common indicators of international competitiveness are at the industry level and are based on relative volumes of foreign trade and investment (Table 1). Country-based competitiveness indicators that have been widely used are based on a combination of quantitative and qualitative information such as those used by the World Economic Forum (WEF) and the International Institute for Management Development (IMD). Other indicators such as real exchange rates have also been used to make inferences about the international competitiveness of countries.

In this study, the international competitiveness of a sector within Australia's tourism industry was the primary level of investigation. Most of the given industry indicators of international competitiveness are based on export market shares and levels of foreign investment (e.g. Dunning, 1977). Kasper (1994) emphasises relative industry profitability as a measure of competitiveness. He argues that the location of production and investment is determined by relative profitability prospects.

⁶ Environmental compliance costs in Australia's tourism industry are estimated to be (on average) 4.9 per cent of total business costs (Huybers and Bennett, 1996).

⁷ Note that advertising using the 'green' image may result in product demand becoming more inelastic. See, e.g., Goddard et al. (1993), Yaw (1992), (Conboy and Goddard 1991) and Rutherford (1989).

The profitability of promotion is dependent on the consumer's responsiveness to changes in price and advertising, which, in turn depend on the structure of the advertising program and how the product is viewed by the consumer

Table 1 Summary of indicators of international competitiveness

Indicator	Author
Competitiveness index (aggregate of weighted qualitative and quantitative factors - country)	International Institute for Management Development (1996), World Economic Forum (1996)
Revealed comparative advantage (export index - industry)	Balassa (1965)
Revealed comparative advantage (net export index - industry)	Deardorff (1980)
Competitive advantage index (combined export market share and foreign direct investment - industry)	Porter (1990)
Net competitive advantage index (combined exports, imports, inbound and outbound foreign direct investment - industry)	Dunning (1977)
Business global competitiveness (BGC) (combination of indicators including growth in a business' global sales or share of a global market - industry)	Sanchez and McKinley (1995)
International Competitiveness (ratio of profitability of domestic industry profitability to profitability of industry in competing locations overseas - industry)	Kasper (1994)
Others: Real exchange rates Relative domestic price Relative rate of return (productive capital assets in the business sector) Relative productivity growth rates (capital and labour) Relative export prices (manufactures) Relative unit labour costs (manufacturing)	Australian Chamber of Commerce (1992)

Whilst these indicators provide a measure of international industry competitiveness, little insight is gained into the factors leading to the results. The WEF/IMD type indicators explicitly consider these factors but focus mainly on supply side factors.

The index of international competitiveness adopted in this study is a combination of the WEF/IMD approach of using weighted factors related to international competitiveness; Kasper's (1994) emphasis on relative industry profitability; and an explicit consideration of demand side factors. The index is constructed by obtaining various data from each firm in the sample:

- The various factors (F) of competitiveness are grouped into demand side factors (both area specific and operator specific), cost factors, and general factors.
- For each factor the importance (I) to the firm's long-term profitability is obtained. This is recorded on a rating scale from 0 to 4, ranging from not important to extremely important.
- The performance of each factor is obtained on a rating scale from -3 (very unfavourable) to +3 (very favourable). This rating is given for each of two situations: the current situation (P₁) and an alternative situation (P₂).
- For each of the two situations an index (ID) can be derived as a weighted performance rating using the importance figures as weights:

$$ID_1 = \frac{\sum(I \cdot P_1)}{\sum I}$$

$$ID_2 = \frac{\sum(I \cdot P_2)}{\sum I}$$

This index can be calculated overall (across all factors F) or separately by subgroup (e.g. for area specific demand side factors only).

- The above is done for each firm surveyed, after which a sector average is calculated.

International competitiveness is a relative and dynamic concept, i.e. changes in the indices are of more relevance than their absolute values. In particular, the focus of this study was the investigation of the effects of environmental regulation on international competitiveness. Therefore, the important results are the changes in the indices - calculated with and without the impact of environmental regulation - rather than the size of the indices themselves.

The index is a "snapshot" of a situation in a particular sector at a particular point in time. This implies that a comparison of indices is possible of the same subject at different points in time (as above) or between different subjects at the same point in time.

The methodology of obtaining the index is based on the perceptions of the representatives of the firms in the sample. The appropriateness of the use of perceived importance and performance ratings can be checked with regards to the demand side factors. This can be done by obtaining importance and performance ratings for each of these factors from consumers; calculating average weighted performance ratings for each of these factors (following the same methodology as above); and comparing the latter with the perceived producers' ratings.⁸

⁸ This is only possible for the situation with environmental regulation since this is the situation the consumers have experienced.

5. Case Study: Far North Queensland Tourism Industry

Background

In order to test the theoretical soundness and practical feasibility of the international competitiveness index, a pilot study using Far North Queensland's tourism industry was undertaken. The methodology was used to measure the impact of environmental regulations on the international competitiveness of tourism operators in the region. Operators have to comply with various types of environmental regulation (including operator's permits and waste disposal regulations). These regulations are administered by government at all levels (including the Queensland Department of Environment and Heritage) as well as by the Great Barrier Reef Marine Park Authority.

Survey

Quantitative data relevant to the calculation of the international competitiveness index for Far North Queensland's tourism industry were collected from both tourism operators and visitors in the region in October of 1996. This was achieved through personal interviews using two different questionnaires: one each for operators and visitors. The representatives of the operators were either the owners of the firms themselves (for the smaller sized firms) or general managers (for the larger companies).

A sample of eight tourism operators from Cairns and Port Douglas was obtained for analysis. These operators, ranging in size of operation from small to very large, represent a broad cross-section of the operators in each of the major tourism industry segments in the region ie. cruising and diving boat operators (5), mainland resort operators (2) and combined resort/boat operator (1). In Far North Queensland, four large cruising and diving boat operators (capable of carrying between 200 and 500 visitors per day each) command 80 percent of the local market of 900 000 annual visitors to the reef and two of these were included in the survey. In Port Douglas, there were 8 smaller sized cruising and diving boat operators - 3 of which were included in the survey.

The data collected from operators for the calculation of the competitiveness index included;

- The importance rating of each of the listed factors in the long-term profitability of their business; and
- The performance rating of each of these factors for two different situations. The first situation was the one with environmental regulations in place. The second situation was the alternative situation had there been no environmental regulations.

The information obtained from this sample was averaged across all the different types of tourism operators surveyed to give the weighted overall rating of international competitiveness of the tourism industry in the case study region in the two different situations.

A sample of thirty-two visitor responses was obtained by conducting interviews at Cairns international airport (with the assistance of a Japanese interpreter), Cairns domestic airport and the Cairns bus depot. The sample of visitors included both domestic and overseas visitors. Australian tourists can substitute domestic tourism for overseas tourism (and vice versa) and hence obtaining information on the determining factors for their choice of destination needs to be included in the determination of an indicator of international competitiveness.

The main data collected from visitors to the area were the importance and performance ratings of area specific demand factors involved in their decision to visit the area (in the current situation with environmental regulation). These factors coincided with the factors listed in the operator questionnaire for comparative purposes.

Results

Impact of Environmental Regulations on International Competitiveness

Table 2 displays the overall results of the application of the international competitiveness index to the Far North Queensland tourism industry. It shows that the aggregate index of international competitiveness with environmental regulation (0.99) is lower than the index without environmental regulation (1.23) (see bottom line of Table 2). In other words, the degree of international competitiveness appears to have fallen as a result of government environmental regulations. The reasons behind this result can be understood through an analysis of the changes in the indices of each of the individual categories comprising the overall index.

Operators perceived environmental regulation as increasing their costs. This is reflected in the decrease in the aggregate index of cost factors by 1.98. The fall in the cost index was particularly attributable to changes in the factors such as the Reef tax (-4.50), marine vessel permit fees (-4.00), sewage treatment/disposal (-3.00), construction costs (-2.00) and waste disposal (-2.00).⁹

Environmental regulation also adversely affected other general supply factors, particularly the certainty of secured property rights (-2.00) and the relationship with regulating authorities.

Conversely, on the demand side, operators indicated that environmental regulations had improved the competitiveness of demand related factors - an increase in the aggregate index of demand factors of 0.21. The enhancement of demand side factors was particularly true for area specific features such as the flora and fauna (+2.14), the designated protected areas (+1.57), the cleanliness of the beaches (+1.25), the diversity of wildlife (+1.14) and the cleanliness of the Reef (+1.13). These results imply that government regulation of the use of these common resources has actually enhanced the attraction of Far North Queensland as a tourist destination.

⁹ The study was undertaken not long after the announcement of an increase in the Reef tax from \$1 to \$6 per visitor. This may have resulted in biased responses regarding this cost factor.

With respect to operator specific demand factors, operators' indicated that environmental regulation had had a negative effect (aggregate index change of -0.35). This was particularly the case for two factors. Firstly, mooring regulations were seen to have compromised the safety of divers (a decrease of 1.86).¹⁰ Secondly, the price - one of the characteristics of the tourism product - was perceived to be less competitive as a result of environmental regulations. This represents the (full or partial) pass through to customers of compliance costs. On the other hand, factors such as operator reputation (+0.57) and promotion (+0.43) had been enhanced by environmental regulation. The reason for this may be that operators were able to capitalise on improved environmental quality of the area by using this development as a promotional feature. Nevertheless, these positive effects were outweighed by the negative impacts on safety and price.

It may be concluded that the positive effect of environmental regulation on the demand side is perceived as being overshadowed by the negative effect of regulation on the supply side. The overall result was an overall reduction in the industry's international competitiveness in the region.

Comparing operator and visitor responses

To assess the appropriateness of using operators' perceptions of the specific demand side factors given in the questionnaire, their importance and performance ratings were compared with the views obtained from the visitors surveyed. This was done for the area specific factors common to both questionnaires. The operators' perceptions were fairly strong reflections of their clients' views.¹¹

Interestingly, 31 of the 34 average importance scores given by operators for each factor were equal to or higher than those given by visitors. Of these, the largest differences occurred in the importance rating of the cost of long-distance transport; area promotion; the general price level; and the novelty of the area. This suggests that, in making their decision to visit the area, visitors place less importance on the general price level, the price of airfares, area promotion and novelty value than operators perceive - the latter two results possibly arising as a result of repeat visits to the area by tourists. Visitors also generally rated the performance of the area specific demand side factors as being more favourable than operators perceive. The largest differences - with a visitor rating higher than that of operators - occurred in the scores for the general price level and area reputation.

In light of these results it seems justifiable to use operators' perceived ratings of importance and performance of the factors of competitiveness in the construction of the competitiveness index.

¹⁰ It has to be noted that these concerns were expressed by the smaller sized diving operators only.

¹¹ For the importance ratings, the difference between the scores given by operators and visitors were less than 0.5 for 13 factors, between 0.5 and 1 for 13 factors, between 1 and 1.5 for 7 factors and equal to 2.5 for 1 factor. In terms of the performance ratings, there was a difference of less than 0.5 for 20 factors, between 0.5 and 1 for 12 factors and greater than 1 (up to 1.3) in only 2 cases.

Table 2 Competitiveness Index			
	With Environmental Regulation	Without Environmental Regulation	Change in Index*
1. Demand side factors, aggregate	1.50	1.29	0.21
Area specific demand factors:			
Area promotion	0.75	0.63	0.13
Area reputation/image	1.20	1.00	0.20
Availability of local transport	-0.14	0.14	-0.29
Beaches (cleanliness, unspoil)	1.88	0.63	1.25
Beaches (crowdedness)	1.75	1.13	0.63
Climate/weather	1.71	1.71	0.00
Cost of local transport	0.71	0.67	0.14
Cost of long-distance transport	-1.00	-1.00	0.00
Cultural attractions (e.g. museums, art galleries)	0.88	0.75	0.13
Distance from visitors' home	-0.50	-0.50	0.00
Entertainment/nightlife	-0.43	0.00	-0.43
Exchange rate	0.57	0.29	0.29
Feeling of remoteness	0.83	-0.67	1.50
Flora and fauna	2.43	0.29	2.14
Friendliness of local community	2.29	1.86	0.43
General price level	-0.14	1.00	-1.14
Health and hygiene standards	2.25	1.50	0.75
Indigenous culture	1.60	1.60	0.00
Visitors' native language spoken	0.83	0.83	0.00
Novelty of area to visitors	1.83	1.17	0.67
Outdoor and sporting facilities (e.g. scuba diving)	2.63	1.88	0.75
Presence of designated protected areas (e.g. National Park)	2.71	1.14	1.57
Proximity to airport	1.57	1.57	0.00
Rainforest (accessibility)	1.25	2.00	-0.75
Rainforest (cleanliness, unspoil)	2.33	1.33	1.00
Reef (accessibility)	1.75	1.63	0.13
Reef (cleanliness, unspoil)	2.25	1.13	1.13
Safety/Political stability	1.43	1.57	-0.14
Several attractions in close vicinity	1.71	1.71	0.00
Shopping	0.71	0.71	0.00
Special events/festivals	0.29	0.43	-0.14
Visa requirements	0.14	0.14	0.00
Wildlife (accessibility)	1.29	1.00	0.29
Wildlife (diversity)	1.86	0.71	1.14
Area specific demand factors, aggregate	1.43	1.00	0.43

	With Environmental Regulation	Without Environmental Regulation	Change in index*
Operator specific demand factors:			
Budget travel facilities	1.33	1.33	0.00
Childcare facilities	0.75	0.75	0.00
Comfort	1.86	1.86	0.00
Competitive price	0.29	1.86	-1.57
Conference facilities	0.75	0.75	0.00
Convenient time scheduling of operations/facilities	1.43	1.71	-0.29
Customer service	1.86	2.29	-0.43
Dining	2.00	2.00	0.00
Entertainment	1.33	1.33	0.00
Environmentally friendly design of facilities (aesthetics)	0.40	0.80	-0.40
Environmentally friendly operation of facilities	1.86	1.71	0.14
Luxury	0.83	1.17	-0.33
Member of established chain	0.75	0.75	0.00
Visitors' native language spoken	1.17	1.17	0.00
Operator promotion	2.00	1.43	0.57
Operator reputation/image	2.57	2.14	0.43
Organised excursions/guided tours	1.57	2.14	-0.57
Qualified tour guide	1.57	2.14	-0.57
Safety	0.71	2.57	-1.86
Sporting facilities	1.00	1.25	-0.25
Operator specific demand factors, aggregate	1.56	1.90	-0.35
2. Cost factors, aggregate			
Construction costs	-1.40	0.60	-2.00
Price of land	-1.25	0.50	-1.75
Price of equipment:			
Marine vessels	-0.20	1.40	-1.60
Diving gear	1.00	2.00	-1.00
Kitchen equipment	0.00	0.00	0.00
Furniture	0.00	0.00	0.00
Other	0.00	2.00	-2.00
Labour, professional (e.g. cooks)	0.25	0.25	0.00
Labour, semi/non-professional	0.25	0.25	0.00
Labour, administrative and managerial	0.25	0.25	0.00
Depreciation/frequency of replacement	0.40	0.80	-0.40
Interest	0.33	0.33	0.00
Cleaning/Laundry services	0.67	1.50	-0.83
Corporate/income tax	0.00	0.80	-0.80
Electricity	-0.20	1.20	-1.40
Fees and charges:			
Reef tax	-2.83	1.67	-4.50
Marine vessel permit fees	-2.00	2.00	-4.00

	With Environmental Regulation	Without Environmental Regulation	Change in Index*
Other	-0.67	0.67	-1.33
Food and beverage	0.80	0.25	0.55
Fuel	-0.57	1.14	-1.71
Land rates	0.00	0.00	0.00
Maintenance of equipment	0.57	0.86	-0.29
Promotion/advertising	0.57	0.57	0.00
Sales tax/VAT	-0.50	-0.50	0.00
Sewerage treatment/disposal	-1.50	1.50	-3.00
Subsidies	1.33	1.33	0.00
Telecommunications	0.29	0.29	0.00
Waste disposal	-1.17	0.83	-2.00
Water supply	-0.20	0.60	-0.80
Insurance	-0.33	0.33	-0.67
3 General factors, aggregate	0.21	1.02	-0.81
Certainty of secured property rights (e.g. land)	-1.33	0.67	-2.00
Domestic exchange rate (level)	0.00	0.00	0.00
Domestic exchange rate (stability)	-0.14	-0.14	0.00
Domestic income per head of the population	0.57	0.57	0.00
Domestic interest rate (level)	0.33	0.33	0.00
Domestic interest rate (stability)	0.00	0.00	0.00
Domestic price level (inflation rate)	0.83	0.83	0.00
Growth of domestic tourism demand	1.14	1.57	-0.43
Growth of global tourism demand	1.17	1.50	-0.33
Relationship with regulating authorities	-0.43	1.57	-2.00
All factors, aggregate	0.99	1.23	-0.24
* A positive number implies an improvement as a result of environmental regulation			

Room for improved competitiveness

The results of the study can be used to identify the areas where the region's international competitiveness can be improved. This requires a comparison of the importance rating and the performance rating of the factors which are perceived to be most important as determinants for international competitiveness. A number of factors that scored highly in terms of importance were also rated highly in terms of their performance. These were mainly area specific demand factors and included reef accessibility, reef cleanliness, rainforest cleanliness, the quality of outdoor/sporting facilities in the area, the local flora and fauna, the presence of a designated protected areas, and health and hygiene standards. However, relatively low performance scores were recorded in the rating of some perceived important factors. This was mainly the case for customer service, safety, competitive price, labour costs, food and beverage costs and the Reef tax. The low performance rating for these factors is an indication that the international competitiveness can be improved. While some of these factors can be addressed by the firms in the industry themselves (for example the issues of customer service), others need to be considered by the government (notably the issues of safety regulations, the Reef tax and labour costs).

6. Implications

This paper is a report on research that is in progress. Whilst the case study reported is a pilot and the findings presented are tentative, a number of significant implications are apparent.

First, the index of competitiveness that has been the focus of this research represents an improvement over other indices developed for similar purposes because of its recognition of the principle of competitive advantage. A particular feature of the approach used is the consideration of supply and demand factors and the viewpoints of both producers and consumers.

Furthermore, the index developed here has been shown to be practical in application. The results produced from the case study of the impact of environmental regulations on the international competitiveness of the Far North Queensland tourism industry appear to be sensible. They offer both the industry and government regulatory agencies some important messages to assist in improving the competitiveness of the industry.

Specifically, the results of the case study indicate that regulating the environment improved the quality of the product offered by Far North Queensland tourism operators. The competitiveness index clearly points to factors that have increased product demand. However, there has been a cost to the industry. The net result has been a decline in the ability of the industry to compete against rival destinations.

This result begs the question: could the regulatory regime have been better formulated to ensure the demand shift occurred but at a lower cost? For policy makers, the answer to this question should involve the consideration of market based environmental regulations that have been demonstrated in other contexts to provide much improved

cost-effectiveness over a command and control centred regime. It should also include a close analysis of proposed regulations for the presence of unintended consequences that impose heavy cost burdens. An example of such unintended consequences is the cost to diver safety of boat mooring regulations on the Great Barrier Reef. The index would be a useful tool for policy makers in their considerations of alternative regulatory regimes - these could be ranked according to their index performance.

The case study also produced a number of other results that are valuable to the industry. The breakdown of the index into its components offers useful information to tourism operators considering marketing strategies. The strengths of their operations as perceived both by themselves and their clients can be identified and used as the basis for promotional activities. However, the index also draws out the factors on both the supply and demand sides that are restricting the competitiveness of the industry. These factors can then be targeted for the attention of either the industry itself or, where relevant, government authorities.

The way forward for the development of the competitiveness index is best viewed as "deepening" and "broadening". In terms of improving the index *per se*, one avenue for further research is to integrate quantitative measurements of the supply and demand factors where ever possible. This would help overcome some of the potential bias that occurs in the index through its use of the subjective assessments of factors by both producers and consumers. This is line with the practice of the IMD and WEF. The broadening of the index would involve extending its application to the consideration of other policies on the international competitiveness of a number of other industries. For example, Australia markets many of its agricultural products on the basis of stringent health standards. Whilst these regulations may encourage demand for the products, they are also expensive to maintain and enforce.

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