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ISLANDNESS AND REMOTENESS AS RESOURCES: Evidence from the tourism performance of Small Remote Island Economies (SRIES)

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ABSTRACT: small remote island economies are known to face a number of economic challenges, particularly, in their trade relations. This paper investigates the impact of remoteness and islandness on tourism performance. Remote islands are found to be well-endowed in nature and scenery. The empirical results show that nature positively impacts tourism performance (revealed comparative advantage) and tourism demand. Interestingly, while being distant is detrimental to tourism performance, being both an island and remote is favourable. Tourism demand is negatively affected by being an island, a small country, or a remote country but favoured by being a small or a remote island. **Keywords**: Small island economies; tourism performance; nature; remoteness.

RESUMEN: Las economías de las pequeñas y remotas islas se sabe que se enfrentan a una serie de retos económicos, en particular en las relaciones comerciales. En este trabajo se investiga el impacto de la lejanía y la insularidad en la práctica del turismo. Las islas remotas se consideran dotadas de naturaleza y paisajes. Los resultados empíricos muestran que la naturaleza impacta positivamente el desempeño del turismo (ventaja comparativa revelada) y la demanda turística. Curiosamente la lejanía es perjudicial para el desempeño del turismo, sin embargo es favorable que sea una isla y remota. La demanda turística se ve afectada negativamente por ser una isla, un pequeño país o un país remoto, pero es favorecido por una ser una isla pequeña y remota. **Palabras clave:** economías de pequeñas islas; desempeño del turismo; naturaleza; lejanía.

RESUMO: É sabido que as economias das ilhas pequenas e remotas enfrentam uma série de desafios económicos, em particular nas relações comerciais. Este artigo resulta de uma investigação sobre o impacto da *remoticidade* e da *insularidade* nas práticas turísticas. Considera-se que as ilhas remotas são bem dotadas de natureza e paisagens. Os resultados empíricos mostram que a natureza tem um impacto positivo na performance do turismo (vantagem comparativa revelada) e na procura turística. Curiosamente, embora a remoticidade prejudique a performance do turismo, a junção de insularidade com remoticidade torna-se um factor favorável. A procura turística é afectada negativamente por se ser uma ilha, ou um país pequeno e remoto, mas é favorecida por no caso de se ser uma ilha pequeña ou remota. **Palavras chave**: economias de pequenas ilhas; performance turística; natureza; remoticidade.

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INTRODUCTION

Size and geography contribute largely to shaping the economic structure of nations. The consequences of the size of nations on economic performance have been studied for long (Kuznets, 1960) and are still debated today. In essence, small size is considered a greater challenge for nations. The hazard of geography – remoteness – is an additional economic "handicap" for nations (Armstrong & Read, 2006). These two characteristics, smallness and remoteness, are particularly found in island states, and when combined, may accentuate their impacts on economic performance.

In this paper, a unique grouping of islands is studied – small remote island economies (SRIEs). Remoteness implies higher transportation costs, which have a direct consequence on trade. Smallness presents challenges that contribute to the economic volatility of SRIEs in several ways. For instance, they remain dependent on a narrow range of exports and export markets, which makes them vulnerable to external shocks. Smallness and remoteness are features that are likely to deter the economies of islands. However, these features can be advantageous for a tourist destination (Armstrong & Read, 2006; Scheyvens & Momsen, 2008).

The present paper examines the thesis that smallness and remoteness are valuable "resources" for islands and provide them with a comparative advantage in tourism via a stock of natural capital. The Heckscher - Ohlin paradigm, which stipulates that countries should develop industries in which they have abundant factors, forms the theoretical basis of this study. Trade liberalisation has made it difficult for SRIEs to cope with traditional traded goods, such as textile and clothing. Recent studies suggest that island economies are better off restructuring their economies towards services such as tourism and off-shore banking rather than towards export manufacturing (Armstrong & Read, 2000; Bertram, 2004). Can the disadvantages of remoteness and smallness be overcome by tourism development? The paper is organised as follows. The next section provides a review of the literature on the disadvantages of small and remote island economies. Second, an exploratory analysis is conducted to situate SRIEs' unique natural assets—enhanced by their smallness and remoteness—that provide them a "natural" comparative advantage in tourism. Third, an empirical econometric analysis provides evidence of the role of nature in promoting tourism performance and tourism demand.

THE CURSE OF SMALLNESS AND REMOTENESS

Smallness implies a small domestic market. Small islands cannot reach the minimum efficient scale of production because domestic

demand is insufficient. This results in high unit costs of production. These states' inability to create a critical mass has led to categorising them as "sub-optimal economies" (Armstrong & Read, 2003). In turn, their ability to reap the benefits of scale economies in exports is limited. Their international competitiveness is affected and so is their growth rate. Indivisibilities in the domestic economy cause costs and prices to be higher. They lag behind in R & D, innovation, and technological advances.

Inefficiencies in administration and the provision of public goods are common features of SRIEs. Briguglio (1995) reports that government functions are expensive because the costs of provision are divisible by a small number of users. A small population means a limited labour market; this problem is exacerbated with migration flows of skilled labour to the larger markets. A small domestic market can usually be served by few firms. This contributes to the formation of oligopolies and monopolies. SRIEs are poorly endowed with conventional resources[1]. Those that are well-endowed usually have undiversified resources, and typically lack the financial capital needed to exploit these resources efficiently and in a sustainable way. With a restricted domestic labour supply, a standard model of industrialisation, in which a large pool of cheap labour is available to run manufacturing industries, cannot be applied. Labour-intensive industries are winnowed down. In addition, the costs of trained and qualified labour are higher than in large states.

SRIEs' inability to produce on a large scale along with their limited resources and lack of innovative technology do not give them much choice for export diversification. They are usually dependent upon a narrow range of exports. They often specialise in a few economic activities which makes them highly vulnerable to external shocks via changing demand and prices. Moreover, they are usually reliant on a few export markets which further exacerbate their vulnerability. Export earnings are volatile since SRIEs are price-takers and their trade volume is an insignificant part compared to the rest of the world.

While open economies benefit from creative competition, innovation, larger market opportunities, and higher income[2], they are also more exposed to external shocks such as changes in the terms of trade.

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1 The term "conventional" refers to resources such as minerals and the like which are used as factors of production. In this paper, natural resources are viewed from an ecological economics perspective. The argument is that some SRIEs are generously endowed with natural resources, for example, natural beauty and exotic fauna which provide welfare per se. They are likely to be byproducts of *islandness* and remoteness and they have not been fully exploited as a tourism strategy.

2 Frankel and Rose (2002) report that every 1 percent increase in a country's overall trade (relative to GDP) raises income per capita by at least one-third of a percent.

Small economies' high degree of openness to trade is mainly size--induced (Armstrong & Read, 2003). Their restricted production capacity compels them to import more. They are highly dependent on their export earnings to finance strategic imports, including oil and other fuels. Their *islandness* requires that such energy supplies be transported at a cost and they often have little storage capacity which increases this cost. Import-substitution is limited so that it may lead to overly protected domestic markets resulting in low quality and high prices. In sum, SRIEs are economically vulnerable–susceptible to damage from changes in the external environment. This accounts for the volatility in the GDP of small economies found in some studies (Easterly & Kraay, 2000).

SRIEs are prone to yet another kind of exogenous shock: natural disasters such as cyclones, hurricanes, landslides, and so on (Briguglio, 1995; Easter 1999; Briguglio & Galea, 2003). Though natural disasters are common to islands and non-islands, the damage they may cause on a small territory is greater partly because agriculture and tourism infrastructure are important for SRIEs and likely to be negatively affected by such disasters. For example, cyclone Dina in 2002 severely affected the economy of Mauritius and Réunion. It caused damage to roads, the electricity network, the water distribution system and agricultural fields. The sugar sector, a major net foreign exchange earner for Mauritius, saw its growth rate falling from 9.9 per cent in 2001 to minus 19.3 in 2002 (OECD, 2004).

An SRIE's quest for development often poses a threat to its environment. Intense construction of housing and commercial buildings reduces agricultural land and can damage their ecosystems. In Mauritius, sugar cane plantation plays a vital role in maintaining the ecological balance; studies have shown that if sugar plantation were to be eliminated, the lagoon would lose its greenness and beauty because of soil erosion. The coastal zone of small islands is constantly under pressure because of tourism development. Small islands have made intense use of their natural resources bringing them to near depletion: for example, gold in Fiji, manganese in Vanuatu, bauxite in Haiti, phosphate in Nauru (Briguglio, 1995). Global warming and rising sea levels are another threat for small islands, especially, the low atolls. Parts of the Maldives are expected to be completely submerged in a projected 20 years time. Thus, an SRIE's environmental vulnerability can hinder its economic progress and at times can affect its very existence. The features described above are characteristics of most small islands. One feature that makes SRIEs different and probably more vulnerable, as far as their trade relation matters, is their remoteness.

Why is remoteness a concern?

Small islands have a high dependence on international trade. A significant subset of these islands is located away from the main trading centres, thereby rendering trade costly. First, remoteness limits access to markets. Countries which are a long distance from large foreign exports markets have a low degree of foreign market access. Second, remoteness limits access to and increases the costs of raw materials, intermediate goods and capital (Redding & Venables, 2002). Third, distance reduces technology flows (Keller, 2001) and also the development and application of R & D. Fourth, remoteness hinders foreign direct investment (FDI) with an elasticity of -0.42 (Redding & Venables, 2002, citing Di Mauro, 2000) and so does cross border equity transactions (Portes & Rey, 2005).

Firms in remote islands face higher transportation costs and longer shipping time than firms located close to their markets. Though transport costs have been decreasing with technological advances, they comprise a significant part of trade costs; Redding and Venables (2002) report that they account for 28 per cent of the value of goods shipped. It is worth noting also that shipping costs are largely determined by monopolies in the carrier companies. As reported by Fink, Mattoo and Feagu (2000), monopoly practices raise transport prices by 25 per cent. The doubling of distance increases transport costs by 20 per cent or more (Limao & Venables, 2001). In addition, transit time costs are considerably larger. An extra day of travel accounts for 0.3 per cent of the value of goods shipped; the number increases to 0.5 per cent if manufacturing goods are considered (Hummels, 2001).

In sum, remoteness limits economic interactions. In other words, trade flows decline with distance. This is illustrated by numerous gravity trade flow studies that estimate the elasticity of trade flows with respect to distance to be in the range of -0.95 to -1.5 (Redding & Venables, 2002). To illustrate how geography matters, Redding and Venables manipulated country locations in some experiments. They observed the effect on income of shifting country 1's to country 2's location. They found that being either islands or landlocked reduces income. Around 7 per cent of GDP is lost by being an island. The two islands considered were Sri Lanka and Australia and the effect would undoubtedly be of greater magnitude if SRIEs are considered. In a paper emphasising economic geography, Redding and Venables (2004) found that halving distance between trading partners leads to an increase in per capita income of 25 per cent.

REMOTENESS AND SMALLNESS AS "ASSETS"

World-wide trade liberalisation has heightened SRIEs susceptibility to external shocks, in particular, for trade in goods. The sudden drop

in their trade performance in the textile and clothing sector following trade liberalisation[3] in competitor countries provides evidence of their vulnerability. See figure 1. While being an island, being small and being remote are disadvantageous for trade in goods, they can be assets for trade in tourism; the "accident of geography" of small islands can be transformed into "precious marketing assets" (Baldacchino, 2002, p.254).

Although the literature abounds of the vulnerabilities of small and remote islands, a few studies have brought forward their strengths. Scheyvens and Momsen (2008) identified six assets of islands. First, they report that "small is beautiful" and isolation is "exotic". Small and remote are, thus, qualities that are in demand from a niche market tourism perspective. The tourist is lured by the "Robinson Crusoe factor" of being far and away. Second, they review the sound economic performance of islands. They benefit by exploiting their tourism potential as their *islandness* and smallness provide a natural niche market. The third strength of islands resides in their socio-cultural and natural assets which have a positive impact on tourism development. Fourth, developmental strategies on islands often take a holistic approach respecting traditions and the environment. Fifth, islands benefit from their strong networks with the rest of the world in terms of trade and remittances. Lastly, the nationalism and coherence of their societies increases their political strength.

Though their study was not exclusive to islands, Brau et al. (2003) showed that smallness is not necessarily bad when small countries[4] specialise in tourism, that is, their ratio of tourism receipt to GDP is more than 10 per cent. They used standard OLS regressions to show that small tourism countries grow faster than other groups of countries, namely, OECD, Oil, LDC, and small country. This implies that the choice of specialisation in a particular sector impacts the economic success of a small nation.

A comparison of SRIEs' tourism with other groups of countries

Table 1 compares the tourist statistics of SRIEs with other groups of nations, namely, the *Caribbean islands*, *European islands* and *All islands*. Overall, tourist arrivals increased over the period. The Caribbean islands – considered as non-remote islands as they are close to a major trading centre, the USA – out-performed the other groups of islands[5]. SRIEs showed a very good performance. Looking just at the figures

3 Trade in textile and clothing was fully liberalized in 2005 with the elimination of the multifibre agreement.

4 Small countries are defined as those having an average population of less than one million during 1960-95 as in Easterly and Kraay (2000).

5 Cyprus is not considered an island in our empirical analysis as it shares borders with Akrotiri and Dhekelia. The sharp decline in European receipts may possibly relate to their political problems.

for *arrivals* is not necessarily revealing; arrivals numbers do not take length of stay and tourist-type into account, and may, understate demand. A high tourist arrival number may only be suggestive of mass tourism whereas tourism receipts can suggest sustainability of the tourism product.

SRIEs' total tourist expenditure increased by almost 100 per cent, outperforming the other group of islands. It is interesting to investigate how much each tourist brings to each group of nations' economies. Over the period, expenditure per tourist has been declining most probably as a result of shorter length of stays (Barros & Machado, 2010). SRIEs experienced the lowest decline implying that they are still seen as attractive destinations. The tourism product is income elastic explaining why the recent global economic downturn had negatively influenced tourist movements around the world (Papatheodorou et al., 2010). The final row of table 1 gives the percentage change in expenditure per tourist before the onset of the recent crisis as possibly providing a superior estimate of the underlying trend in demand. The negative trend persists except for SRIEs. The results suggest that tourist have been spending more on SRIEs—and thus putting a higher value on SRIEs' tourism assets—than the other groups of nations. The valorisation of smallness and remoteness may have been the result of increased investment in tourism but reverse causality is not to be excluded.

Table 1. Visitor arrivals tourist expenditure

Arrivals	Caribbeans[α]	SRIEs[β]	European Islands [κ]	All islands [ρ]
% change in arrival (95-09)	45%	70%	6%	44%
% change in total tourist expenditure (95-09)	16%	97%	-20%	26%
% change in expenditure per tourist (95-09)	-24%	-3%	-25%	-16%
% change in expenditure per tourist (95-06)	-15%	6%	-20%	-7%

[α] *Antigua and Barbuda, Aruba, Bahamas, Barbados, Bermuda, Cayman Islands, Dominica, Grenada, Guadeloupe, Jamaica, Martinique, Netherlands Antilles, Puerto Rico, St Kitts, St Lucia, St Vincent& the Grenadines, Trinidad & Tobago, UK Virgin Islands, US Virgin Islands*

[β] *Fiji, Kiribati, Solomon Islands, Tonga, Vanuatu, Maldives, Cape Verde, Comoros, Madagascar, Mauritius, Reunion, Sao Tome & Principe, Seychelles*

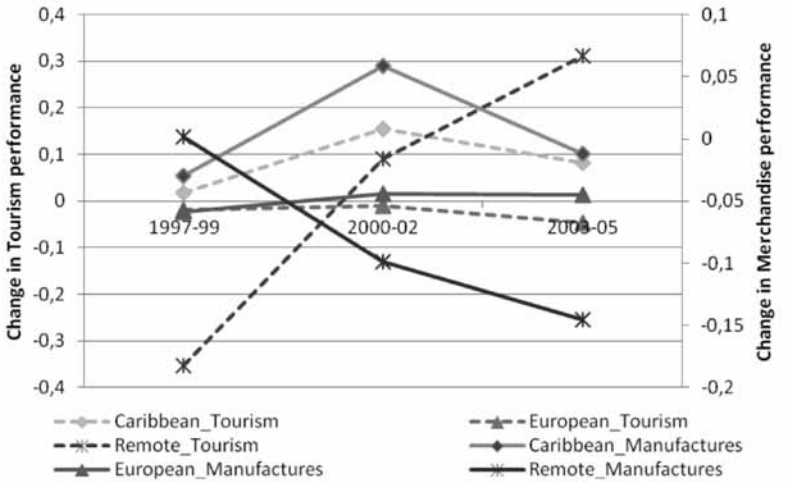
[κ] *Antigua and Barbuda, Aruba, Bahamas, Barbados, Bermuda, Cayman Islands, Dominica, Grenada, Guadeloupe, Haiti, Jamaica, Martinique, Netherlands Antilles, Puerto Rico, St Kitts, St Lucia, St Vincent & the Grenadines, Trinidad & Tobago, UK Virgin Islands, US Virgin Islands, Cyprus, Iceland, Malta, Sri Lanka, Philippines.*

[ρ] *Cyprus, Malta*

How important is tourism for island economies?

Over the time period 1995 - 2009, travel and tourism (TT) direct contribution to SRIEs' GDP, TT capital investment and TT employment grew remarkably by 54, 59 and 54 per cents respectively. TT employment grew by only 14 per cent for the Caribbean and TT capital investment grew by 15 per cent for the European islands. Tourism is a growing sector in SRIEs. Is there evidence of above average performance in the tourism sector comparatively with other sectors?

Figure 1 allows one to compare the change in trade performance in tourism and manufactures of SRIEs, the Caribbean and European islands over three time periods. While there were positive growth rates in the Caribbean and European islands' manufactures trade performance, there was a sharp decline in the performance SRIEs. Tourism performance growth was positive for the Caribbean but negative for the European islands while the trend was a declining one from period 2000 - 2002 onwards. It is interesting to note the surge in the tourism performance growth of SRIEs.



Note. Trade performance is measured by Balassa's index of revealed comparative advantage.

Figure 1. Growth in tourism and manufactures trade performance

Source: WDI.

Destinations' attractiveness

Islands have always been a source of attraction to men. The citation by King reflects the qualities that island countries suggest to tourists.

> An island is a most enticing form of land. Symbol of the eternal contest between land and water, islands are detached, self-contained entities whose boundaries are obvious; all other land divisions are

> more or less arbitrary. For those of artistic or poetic inclination, islands suggest mystery and adventure; they inspire and exalt (King, 1993, p.14).

Though a destination's attractiveness depends on multiple attributes, in an island context, the factor *natural endowment*[6] plays a major role. This section assesses SRIEs' stock of natural capital that makes them unique tourist attractions. A major difficulty in this endeavour is to find a proper measurement of natural endowment. What constitutes attractive natural capital is not easy to define or measure. There is inevitably a normative aspect to the concept; what is beautiful or not, differs from one individual to another. However, the literature has successfully identified the determinants of a destination's attractiveness and as anticipated, the factor nature is highly ranked.

Butcher (2006) brings evidence from four case studies to emphasise the importance of natural capital in favouring tourism, in particular, ecotourism and hence further sustainable economic development. Yangzhou Hu and Ritchie (1993) reviewed the literature on the different factors that attract tourists and found that "natural scenery and climate" were the most important ones. In their own survey, they determined the relative importance of different attributes in contributing to a destination's attractiveness in two contexts: recreational and educational. In the recreational dimension, scenery, climate and accommodation ranked first, second and third respectively. In the educational dimension, uniqueness of the lives of local people, historical attractions and scenery ranked first, second and third respectively. In addition, across the five destinations they considered, scenery had a high score (a score greater than 4; 5 is the highest). The results, thus, emphasise the natural scenery factor in making a destination attractive. Similarly, Oliveira and Pereira (2008, p.3) found that landscape and climate were the most important factors considered by tourists visiting the Madeira Island. "Authenticity of its nature" differentiated Madeira Island from other destinations.

SRIEs and nature

Are small remote islands well-endowed with natural capital? The NGO, *Conservation International*, has identified "biodiversity hotspots" around the world. They are "those parts of the world that contain the richest biological diversity" (Yangzhou Hu & Ritchie, 1993, p.535). Region-wise, the hotspots spread across North and Central America,

6 Natural endowment includes the stock of fauna and flora, landscape, climate and the like. The terms "natural capital" and "natural endowment" are used interchangeably throughout this thesis.

South America, Europe and Central Asia, Africa, and Asia-Pacific. Madagascar and Indian Ocean islands form one of the sub-regions in Africa designated as biodiversity hotspots. They include the islands of Madagascar, Mauritius, Comoros, Réunion, and the Seychelles. The area hosts an impressively rich biodiversity of 600,461 km^2. Other biodiversity statistics can be reviewed at http://www.biodiversityhotspots.org.

The Polynesia-Micronesia sub-region in Asia-Pacific covers Fiji and all the islands of Polynesia and Micronesia, including, Samoa, Tonga, and Cook Islands. East Melanesian islands include the Solomon Islands and Vanuatu islands. Together, these two sub-regions cover more than 146,000 km^2. Most of the SRIEs considered in this paper are located in the biodiversity hotspots designated areas. This is indicative of their rich stock of natural capital. To support this observation, more than half of SRIEs are eco-regions. An eco-region[7], as defined by the *World Wildlife Fund*, is a large unit of land or water containing a geographically distinct assemblage of species, natural communities, and environmental conditions. Given such valuable resource endowments, it is intuitive to expect SRIEs to be attractive tourist destinations and henceforth to perform well as far as their tourism indicators are concerned.

NATURE AS A DETERMINANT OF SRIES' TOURISM PERFORMANCE AND DEMAND?—THE ECONOMETRIC EVIDENCE

This section empirically assesses whether and the extent to which nature influences an SRIE's tourism performance and tourism demand. As previously documented, factor endowments are important determinants of a destination's attractiveness. Thus, the theory of comparative advantage, which emphasises spatial variations in endowments as the basis for trade, is relevant in assessing destinations' performances. The theoretical foundation of this study is based upon standard Heckscher - Ohlin international trade theory which stipulates that trade is based on relative factor endowments; differences in factor endowments determine production cost. In a two-sector and two-island world, island R is well endowed with natural beauty (exotic beaches) and island C is relatively richer in capital endowments. Tourism and manufactures are produced in each of the island economies with the two factors nature and capital; tourism is nature-intensive while manufacturing is capital-intensive. According to Heckscher - Ohlin, each island will specialise in the sector in which it has a comparative advantage or where its production cost is the lowest. Thus, island R will specialise

7 List of eco-regions can be obtained at http://wwf.panda.org/about_our_earth/ecoregions/ecoregion_list/

in tourism (as it is well-endowed in nature) while island C in manufacturing (well-endowed in capital).

This leads to the main hypothesis of the paper: countries with a rich natural endowment will have a better performance in tourism than those with a weak natural endowment. A standard OLS cross--country regression is used to assess this hypothesis[8]. The standard measure of tourism performance, revealed comparative advantage, is employed. The second hypothesis claims that sustained tourism revenues are largely dependent on the quality of natural resources present in a country. Tourism receipts, tourist arrival and tourism receipt per tourist are used as proxies for tourism demand.

Data and variables

Tourism performance is assessed by a measure of comparative advantage, namely, the Balassa revealed comparative advantage index. Balassa (1965) proposed that comparative advantage can be revealed without having to include all the factors that actually determine comparative advantage and he suggested a corresponding index. Thus, comparative advantage is inferred from observed data and is called revealed comparative advantage (RCA). RCA does not try to understand the sources of comparative advantage; it is a measure of trade performance. The traditional Balassa index measures a country's export of a commodity relative to a set of exports and relative to a set of countries. The index is as follows:

$$RCA = \frac{X_{ij}}{X_{it}} \Big/ \frac{X_{nj}}{X_{nt}}$$

X represents exports, i is a country, j is tourism exports, t is total exports of goods and services, and n is a set of countries. Country i is said to have a comparative advantage in commodity j when RCA > 1, otherwise it has a comparative disadvantage. One of the obvious limitations of RCA is that it does not consider the effects of interventions in the trade patterns such as export subsidies, and other protectionist measures. In this case, the RCA reflects the extent to which countries are relatively specialized in tourism export. Tourism performance (TP) is computed using relevant indicators from the *World Development Indicators* databank (WDI) (World Bank, 2010).

8 Though panel estimation is superior, data unavailability constrained the estimation procedure. The main exogenous variable, *Nature,* is only available for a fixed period.

Tourism demand is often defined as the quantity of tourism products and services that the consumers are willing to acquire during a specific period of time and under certain conditions (Song & Witt, 2000). In their review of econometric modelling in tourism research, Li et al. (2005) reported that most studies have focused on the latter definition which is based on quantity and used tourist arrivals as the main dependent variable though other measures are increasingly being used. As mentioned previously, arrivals ignore length of stay and quality of products being offered. A focus on quality or value is superior but still ambiguous as it entangles both expenditure and type of tourism products and services. Here, three measures are used for tourism demand: total tourism receipts, tourist arrivals and receipts per tourist. These figures are sourced and calculated from WDI databank.

In line with Freytag and Vietze (2009), biodiversity indicators from the World Resources Institute are used as proxies for nature. Freytag and Vietze (2009) use the number of bird species[9] relative to the size of a country as proxy for biodiversity. The focus of this paper is island economies: while the number of bird species is a good indicator of natural endowment, the number of fish species is also highly relevant for islands' environmental richness and health[10]. Thus, natural endowment is measured by the variable *Nature* - the number of bird and fish species relative to each country's size - and it is the most important exogenous variable. Other variables used in the models and their sources are listed below:

a. GDP per capita is taken from the WDI databank (2010); except otherwise stated, an average of the years 2003 - 2005 is used for most of the indicators to cater for non-availability of data. Missing data was complemented by figures from the *World Factbook*.
b. Distance is sourced from the CEPII database[11]; CEPII provides data on the geodesic distances using the great circle formula. In this thesis, the variable distance measures distance to one of the closest world administrative centres, namely, Brussels (EU), Washington D.C. (US), and Tokyo (Japan). Where data

9 Blair (1999) discusses some of the reasons why birds can be used as indicators of biodiversity. First, birds are distributed over a broad geographical area and as such they are present in almost all countries, political units or geographical units of the world. Second, they are sensitive to changes in the environment so that they can be good indicators of environmental wealth. Third, birds are found across all levels of development from relatively natural to highly urban areas. Fourth, the number of bird species is less likely to be subjected to political influence *(Rawls & Laband, 2004)*.

10 The abundance of marine mammals is an indicator of marine ecosystem (Rosen & Trites, 2000) and water quality (Gannon & Stemberger, 1978) and changes in their environment (Whitfield & Elliott, 2002). Fish like birds are diverse and distributed in rivers and oceans around the world and sensitive to changes in their environment.

11 http://www.cepii.fr/anglaisgraph/bdd/distances.htm

was not available, distance was manually calculated using distance calculators[12].

c. Remote country is a dummy variable. It includes all countries that are at least 4000 km away from the nearest world trading centre irrespective of their size.
d. Small country is a dummy variable. It includes all countries that are less than 100,000 km^2 in size; it includes islands and non--islands irrespective of their remoteness.
e. Island is a dummy variable and is defined as a country or territory which has no borders with any other country or territory. Thus, Tonga and Bahrain are islands. Although small, Andorra is definitely not an island as it is landlocked. Even Haiti is not an island on this definition as it shares a 360 km border with the Dominican Republic.
f. Remote Island is a dummy variable that includes all islands that are at least 6000 km away from the nearest world trading centre irrespective of their size. In some cases, remoteness of 4000 km is also used for comparison.
g. Small Island is a dummy variable that includes all islands that are economically small. The common criteria used to categorise a country as small are population, area and GDP measures (Crowards, 2002). While these measures are positively correlated, they are less pronounced for islands in general but more pronounced for remote islands. In this paper, small islands are islands whose area does not exceed 100,000 km^2. Out of 32 small islands, 25 of the islands are less than 7000 km^2. For comparative purposes, area of less than 40,000 km^2 and 7000 km^2 are also used as indicated.
h. The dummy SRIE captures islands that are both small and remote, with an area of less than 100,000 km^2 and a distance greater than 6000km. Other combinations of area and distance and GDP are used for comparison.
i. Tourism price competitiveness was taken from the *Travel and Tourism Competitiveness report* (2007) available on the *World Economic Forum* website. A high value for price competitiveness indicates prices for tourist services which are low relative to those in competitor countries. However, the dataset is reduced to 118 observations.
j. Coastline is sourced from the *World Factbook* and measures the length of the coast of each country in kilometres. For each country, the variable was scaled by its area.

12 Distance is manually calculated for *American Samoa, Antigua & Barbuda, Channel Islands, Guam, Heard & McDonald islands, Holy See, Isle of Man, Kosovo, Liechtenstein, Myanmar, Timor-Leste, and U.S. Virgin Islands.*

k. Population and Area; source WDI databank (2010). The connectivity level of a country is used as a proxy for technological development and accessibility. Phone per 100 users is available from WDI databank (2010).
l. Absence of violence (ranking) and Rule of Law are proxies for the safety of a destination. Data is obtained from the World Bank governance indicators.

Tourism performance and natural endowment

The following equation is applied to test the first hypothesis,

$$TP_i = \beta_0 + \beta_1 Nature_i + \beta_2 x_i + \varepsilon_{1i}$$

where *TP* is tourism performance which is calculated using the Balassa formula, *Nature* is the natural endowments of islands calculated as mentioned above, and $x_i x_i$ is a set of control variables: *GDP per capita*, *Coastline*, *Distance*, *Area* and dummies, *Island*, *Small island*, *Remote island* and *SRIE* among others. Price competitiveness is excluded from the set of regressors since it is an outcome and not a determinant of comparative advantage. Estimation is by OLS.

According to the hypothesis under investigation, a high *Nature* score for a country should relate positively to tourism performance for that country. The developmental status of countries is captured by GDP per capita and is expected to show a negative sign since developing countries are assumed to be better endowed in *Nature*. *Islandness* coupled with remoteness is reflected by the variable SRIE. Table 3 shows the results and supports the hypothesis that richer natural endowments promote tourism performance.

As expected, being relatively more developed does not favour tourism performance as indicated by the negative sign on the GDP per capita coefficients. This holds for all the four models. Lengthy coastline improves tourism performance and is significant. However, being distant and large are detrimental to performance. As hypothesized, both remote islands and small islands are significant determinants of tourism performance. SRIEs tourism performance is negative and not significant. It is interpreted as a sub-optimal use of their smallness and remoteness to attract tourists. Inscription to the world heritage sites decreases the explanatory power of the model and is not reported here. The variable nature was substituted by "protected areas", both marine and terrestrial relative to each country's size. The results, not reported in this paper, suggested that tourism performance is enhanced by having more protected areas which is another proxy for the extent of natural endowment.

Table 2. Tourism performance and nature

	I	II	III	IV
Nature	1.09* (2.00)	1.10* (2.02)	1.34** (3.01)	1.13* (2.30)
GDP per capita	-3.76*** (-3.73)	-3.83*** (-3.79)	-2.92*** (-3.38)	-2.73** (-3.25)
Coastline	1.73*** (3.50)	1.73*** (3.49)	2.54*** (4.16)	1.68* (2.58)
Distance	-1.56* (-2.18)	-1.55* (-2.18)	-1.23 (-1.73)	-1.03 (-1.51)
Area	-1.06e-07 ** (-3.28)	-1.05e-07 ** (-3.24)	-1.07e-07 ** (-2.66)	-8.13e-08** (-1.65)
Dummies:				
Island	-0.38 (-0.53)			
Small island area<100000km^2	3.95** (2.97)	3.57*** (3.18)		
Remote island >6000km	2.68** (2.71)	2.31*** (3.48)		
SRIE area<100000 km^2 >6000km away	-2.98 (-1.92)	-2.61 (-1.90)		
Small island area <7000 km^2				3.26*** (3.53)
Small island GDP<US$6000			3.70* (2.58)	
Remote island >4000 km away			0.30 (0.32)	-1.36 (-0.89)
SRIE area<40000 km^2 GDP<US$6000			-1.02 (-0.50)	2.74 (1.67)
R^2	0.5389	0.5386	0.4940	0.5248
N	166	166	166	166
t-values are in parenthesis			p<0.05*, p<0.01**, p<0.001***	

Tourism demand and natural endowments

To test the second hypothesis, three aggregate demand functions are estimated. TD, a proxy for tourism demand, is in each function tourism receipts, tourist arrivals and receipt per tourist. It is expected that natural endowment will positively influence tourism demand. A number of control variables are used. GDP per capita, in the demand function, reflects the standard of living in the tourism country and is expected

to show a positive sign as higher living standards in the tourist destination promotes demand. The log-linear demand function is as follows:

$$\log TD_i = \alpha_0 + \alpha_1 \log Nature_i + \alpha_2 x_i + \varepsilon_{2i}$$

$x_i x_i$ represents a set of control variables: *Log_GDP per capita*, *Log_ tourism price competitiveness, Log_absence of violence, Log_Rule of law, Coastline*, *Distance*, *Area* and dummies, *Island*, *Small country, Remote country, Small island*, *Remote island* and *SRIE* among others.

Tourism receipts

As reported in table 4, nature is a major determinant of tourism demand and is robust across the first two models. GDP per capita, population and governance indicators positively affect the demand for tourism. Distance is a positive explanatory variable but marginally significant.

Length of coastline negatively impacts tourism demand suggesting that these destinations are not quality destinations as they bring less receipt. While being a remote country negatively influences demand, being a remote island does not. Similarly, smallness negatively impacts all countries but not islands. However, being just an island is detrimental to tourism demand. Models IV and V are augmented with the variable *tourism price competitiveness* (PC) which reduces the number of observations but does not affect our main findings. PC has a positive estimated coefficient but this is not significant. Population continues to be highly significant and positive. However, distance and coastline lose their significance[13].

Table 3. Tourism receipts and arrivals and nature

	I	II	III	IV	Arrivals
Log Nature	0.23** (3.29)	0.22*** (3.47)	0.16 (1.93)	0.16* (2.41)	-0.03 (-0.35)
Log GDP per capita	0.67*** (9.13)	0.70*** (9.52)	0.68*** (6.06)	0.82*** (11.59)	0.60*** (6.86)
Log Tourism price competitiveness			0.91 (1.19)	1.14 (1.74)	1.34* (1.99)
Log Absence of violence	0.20 (1.37)		0.35 (1.76)	0.55*** (3.41)	0.47** (2.99)

(Continued)

13 Since distance and coastline could potentially be affecting tourism price competitiveness, the latter was instrumented and the function was estimated using a two-stage-least--squares. The results of a Hausman test provided no support for the use of two-stage-least--squares.

(cont.)

	I	II	III	IV	Arrivals
Log Rule of law	0.51** (2.96)	0.57*** (5.14)	0.44 (1.70)		
Log population	0.83*** (15.81)	0.80*** (16.70)	0.77*** (12..39)	0.80*** (14.67)	0.63*** (10.31)
Log Phone	0.15 (1.55)	0.14 (1.43)	0.09 (0.74)		
Coastline	-0.17** (-3.26)	-0.16** (-3.20)	-0.23 (-0.40)		1.33* (2.11)
Distance	0.96* (1.99)	1.12* (2.38)	0.09 (0.14)		0.41 (0.59)
Area	4.26e-09 (0.16)				
Dummies:					
Island	-1.04* (-2.24)	-1.07** (-2.64)	-1.03* (-2.17)	-1.00* (-2.01)	-1.01** (-2.63)
Remote country >4000 km	-0.97*** (-4.02)	-1.09*** (-4.71)	-0.64* (-2.20)	-0.71*** (-3.57)	-0.76* (-2.09)
Small country <100000 km^2	-0.51* (-2.47)	-0.52* (-2.53)	-0.56* (-2.39)	-0.49* (-2.20)	-0.32 (-1.29)
Small island area<100000km^2	1.02* (1.91)	1.04** (2.23)	1.37* (2.27)	1.34* (2.20)	1.27* (2.90)
Remote island >6000km	1.43*** (2.82)	1.49*** (3.27)	1.55** (2.79)	1.67** (3.04)	0.24 (0.61)
Small & Remote 100000km^2&6000km	-0.88 (-1.55)	-0.92* (-1.77)	-1.02 (-1.69)	-0.89 (-1.46)	
R^2	0.8818	0.8780	0.8631	0.8548	0.7616
N	174	174	120	120	118
t-values are in parenthesis			p<0.05*, p<0.01**, p<0.001***		

Tourist Arrivals

The same conclusions can be drawn from the coefficients of the demand equation with tourist arrivals as dependent variable. The results are not reported here to save space. However, nature has a positive but lower impact on tourist arrivals than on tourist receipts. This confirms the argument that *arrivals* is an indicator of mass tourism as opposed to *receipts* which indicates quality tourism. Governance indicators are less important. Distance continues to have a positive but larger impact on tourist arrivals than on receipts. The open sky policies adopted by many countries have considerably lowered air travel costs and thus invited the tourist to travel further away. However, being a remote island does not matter for arrivals.

The results changes slightly when the variable PC is added. See model Arrivals in Table 4. Nature has a negative impact on arrivals but the estimated coefficient is not significant. An increase of 1 per cent in a country's PC increases arrivals by more than 1.3 per cent but is only marginally significant. Interestingly, the coefficient for the length of coastline becomes positive and significant while distance loses its significance.

Expenditure per tourist

While nature and level of development of a country positively influence expenditure per tourist, distance does not. Nevertheless, being both remote and an island has a positive and significant impact on the contribution of a tourist. An SRIE negatively affects tourism demand. Models I and II in table 5 show the detailed results. Models III and IV show the results of the regression with the variable PC which negatively impacts receipt brought per tourist. This suggests that the more price-competitive a country is, the less is expenditure by a typical tourist. The PC coefficients suggest that price is irrelevant once the tourist has arrived at the selected destination. Thus, if the tourist has decided to travel to a high-value destination, say a remote island such as the Maldives, her expenditure will be higher than in a lower cost destination. It seems possible that expenditure per tourist relates more to the type of tourist than does arrivals. Nature, population and GDP per capita variables have the expected positive sign while coastline becomes negative. It suggests that the length of coastline does not affect expenditure per tourist when the latter has already arrived at a destination.

Overall Findings from the demand regressions

From the regressions, it seems that nature is a determinant of tourism receipts but less a determinant of tourism arrivals. Level of development affects tourism positively. Rule of law is a better governance indicator than absence of violence in determining the choice of a destination. Population, a size variable, is also a good indicator of destination choices. It is clear that being an island does not favour tourism receipts, tourism arrivals or expenditure per tourist. Islands face challenges that are not encountered in non-island states such as limited resources and accessibility which may hinder tourism development.

The standard variable analysed in this literature is total tourism receipts. This variable may be decomposed into the product of total arrivals and expenditure per tourist. My analysis has suggested that these two variables have different determinants and it is therefore preferable to model them separately. In particular, price factors appear to be important in determining destination choice, and hence arrivals, but unimportant in determining expenditures once the tourist has arrived.

Price may be a sorting factor with the result that low value tourists choose more competitive destinations. This might be further analyzed if access is obtained to data on individual tourist destination and expenditure choices.

Table 4. Expenditure per tourist and nature

	I	II	III	IV
Log Nature	0.07 (1.71)	0.07 (1.56)	0.14 (1.95)	0.15* (2.24)
Log GDP per capita	0.14* (2.44)	0.12* (1.88)	0.22** (2.63)	0.24** (2.78)
Log Tourism price competitiveness			-0.35 (-0.52)	-0.45 (-0.75)
Log Absence of violence	0.12 (1.05)			
Log Rule of law		0.16 (1.34)		
Log population	0.09* (2.02)	0.06 (1.54)	0.15** (2.90)	0.25** (3.29)
Log Phone				
Coastline	0.004 (0.13)	-0.007 (-0.25)	-1.25* (-2.29)	-1.32* (-2.56)
Distance	-0.95* (-1.99)	-0.65 (-1.77)	-0.22 (-0.55)	
Dummies:				
Island	0.17 (0.76)		0.15 (0.87)	0.14 (0.82)
Remote country >4000 km^2 away	0.19 (0.95)			
Small country <100000 km^2	-0.04 (-0.19)	-0.08 (-0.41)		
Small island area<100000km^2	0.01 (0.04)	0.14 (0.76)		
Remote island >6000km away	1.23*** (3.62)	1.30*** (5.08)	1.16*** (4.15)	1.05*** (4.44)
SRIE 100000km^2 & 6000km away	-0.77* (-2.27)	-0.86** (-2.82)	-0.52 (-1.93)	-0.52 (-1.79)
R^2	0.2764	0.2784	0.3091	0.3070
N	170	170	118	118
t-values are in parenthesis			p<0.05*, p<0.01**, p<0.001***	

From the estimated coefficients, a small or a remote country seems to be an underrated tourist destination. Interestingly, small islands and remote islands are relatively better tourist attractions. This is particularly true for remote islands that are more than 6000 km away from the nearest trading centres. Thus, remoteness attracts high value tourists. Surprisingly, the coefficients of coastline in our demand models have a negative sign. At first, length of coastline appears not to be a major driver of tourism receipts and arrivals. However, when price competitiveness is added to the models, coastline shows the expected sign but becomes irrelevant for expenditure per tourist. The demand equation with expenditure per tourist as dependent variable is clearly more revealing that the other two equations. Small islands and remote islands have a comparative advantage relative to non-island nations. Even though they are relatively expensive destinations, the tourist will still spend as long as the destination package has been sold to him.

CONCLUSION

The aim of this paper is to empirically assess the role of natural endowments in the tourism performance of island economies. Small and remote islands face a number of economic disadvantages as they have small markets, limited human and capital resources, dependent on foreign exchange earnings and vulnerable to external shocks among others. While smallness and remoteness are characteristics that constrain island economies, these features can be turned into valuable assets which are particularly relevant for the tourism sector. Small islands have always fascinated and attracted tourists given the unique product they have to offer; in addition, the qualitative literature stresses that remoteness enhances islands' attractiveness.

In this paper, I have underlined the geographical advantage of SRIEs as they are located in rich biodiversity areas and eco-regions. A comparative analysis showed that over the last 15 years SRIEs' tourist spending grew faster than the Caribbean's and the European islands. Moreover, tourism has been a major pillar of SRIEs' economies. The results of a cross country OLS show strong support that a rich natural endowment is a significant determinant of tourism performance. An improvement of Freytag and Vietze's measure of biodiversity is used to capture an island's natural endowment. In line with the economics literature, distance negatively affects trade, here trade in tourism. However, a remote island relates positively with tourism performance, suggesting that remoteness, when coupled with *islandness,* is not a detriment to tourism performance. Developing countries tend to have better tourism performance as revealed by the indicator GDP per capita.

Three aggregate demand functions were estimated where tourism receipts, tourism arrivals and receipt per tourist were used as proxies

for tourism demand in each case. When receipts and arrivals are used for demand, the results provide further evidence of the importance of nature in promoting tourism but the impact is of lesser magnitude for arrivals. The argument that *arrivals* is a poor indicator of sustainable tourism is confirmed with the latter findings. While governance indicators, GDP per capita and population positively affect tourism demand, the length of coastline does not. It seems to suggest that the length of coastline is an inappropriate indicator of the length or quality of beaches. Distance positively affects tourism receipts and arrivals: the lure of remoteness is again evident. While being an island reduces demand, being a remote island promotes demand. The results suggest that being more price-competitive has a positive impact on demand but the importance of nature is, consequently, reduced. This may suggest an undervaluation of a country's natural endowments and have implications for eco-tourism economics.

The results of the third demand equation – receipts per tourist as dependent variable – are of particular relevance. It shows that nature does matter but level of development matters more. Having a longer coastline does not guarantee increased contribution by a tourist but instead reduces revenue. The most significant factor in bringing additional revenue is being a remote island. But being an SRIE is detrimental to tourism demand. This implies that small remote island economies may not be effectively exploiting their tourism potential by tapping into their rich stock of natural endowment. Marketing strategies geared at putting in the limelight the rich and exotic natural and cultural resources rather than just the traditional sun-and-sea destination might prove fruitful.

As such, the findings of this study are crucial when marketing a destination. While limited accessibility to an island may curb demand, if such constraint is removed, performance in the tourism sector may increase: the value of remoteness can easily offset the cost of distance. In addition, SRIEs should not only capitalise on their "natural" comparative advantage in tourism but also sustain this advantage through nature-friendly policies since a degradation of nature may decrease performance. While specialization in industries in which one has abundant factors is relevant and beneficial for tourism countries, sustained economic benefits depend on various other factors such as scale economies, transaction costs, innovation and knowledge expansion which were not covered in this thesis.

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