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LEON DU TOIT, JOHAN FOURIE AND DEVON TREW

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LEON DU TOIT
BUREAU FOR ECONOMIC RESEARCH
UNIVERSITY OF STELLENBOSCH
PRIVATE BAG X1, 7602
MATIELAND, SOUTH AFRICA
E-MAIL:LEONDUTOIT@SUN.AC.ZA

JOHAN FOURIE
DEPARTMENT OF ECONOMICS
UNIVERSITY OF STELLENBOSCH
PRIVATE BAG X1, 7602
MATIELAND, SOUTH AFRICA
E-MAIL: JOHANF@SUN.AC.ZA

DEVON TREW
DEPARTMENT OF ECONOMICS
UNIVERSITY OF STELLENBOSCH
PRIVATE BAG X1, 7602
MATIELAND, SOUTH AFRICA
E-MAIL:
14573172@SUN.AC.ZA

UNIVERSITEIT STELLENBOSCH UNIVERSITY

BER
BUREAU FOR ECONOMIC RESEARCH

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LEON DU TOIT, JOHAND FOURIE AND DEVON TREW[1]

ABSTRACT

Tourism flows are usually explained through demand-side factors such as income growth in developed economies and changes in the preferences of visitors. While these models are adequate for short-term forecasts, little theoretical justification is provided to explain why certain countries perform better than others. This paper identifies which countries have a comparative advantage in the export of travel services (tourism). Consequently, the paper seeks to identify the sources of this comparative advantage. We include the standard explanatory variables (factors of production, including natural environment) for Ricardian comparative advantage, plus measures of infrastructure, health, safety and security, tourism prioritization, and various dummy variables. We also develop and test new variables, including a neighbourhood variable, which measures the benefits obtained from regional tourism clusters. Our results have important policy implications; it is clear that the natural environment has a large positive and significant impact on a country's revealed comparative advantage, as do transport endowments (a measure of relative accessibility) and the neighbourhood variable. These findings correspond to the predictions of the neoclassical trade theories (namely Heckscher-Ohlin) and to some extent the new trade theories (Krugman).

Keywords: tourism, comparative advantage, trade in services
JEL codes: F11

[1] Leon du Toit, Bureau for Economic Research, Stellenbosch, South Africa; Johan Fourie, Department of Economics, Stellenbosch University, South Africa; Devon Trew, Department of Economics, Stellenbosch University. Corresponding author: Johan Fourie, johanf@sun.ac.za. The authors would like to thank Christiaan Loots and Emile du Plessis for valuable research assistance, Adriaan van Niekerk for the preparation of the map, as well as the assistance of Thea Chiesa in sharing the World Economic Forum data in electronic format.

INTRODUCTION

Travel service exports is one of the fastest growing industries in the global economy. The rise of tourism is usually explained through demand-side factors such as income growth in developed economies and changes in the preferences of visitors. While these models explain empirical observations relatively well and are often used in forecasting tourist arrivals, little theoretical justification is provided to explain why certain countries perform better than others.

Conversely, trade models abound that attempt to explain why some countries export certain commodities, and others not. While trade has occurred since the dawn of civilisation, it is only more recently that economists have tried to identify why and what countries (should) trade, and with whom. Adam Smith's absolute advantage and David Ricardo's theory of comparative advantage paved the way, but it was only in the twentieth century that the Heckscher-Ohlin theory was posited to explain that countries will export those goods produced with the abundant factor of production. Yet, these theories did not explain global trade fully, and by the 1970s economists often viewed the ability of theories to predict trade flows with suspicion. New trade theories, relaxing some of the strong assumptions of Heckscher-Ohlin and incorporating increasing returns to scale and transport costs, paved the way for a more nuanced understanding of trade and, tentatively, better policy prescriptions.

While these theories helped to explain the rapid rise in global trade, the services sector has witnessed even greater growth performance. The improvements in communication technology, notably the development of the internet and cellular technology, have allowed for specialisation, and therefore, trade in what previously was considered 'untradable' or 'in-house' services. The signing of the General Agreement on Trade-in-Services (GATS) in 1995 signifies its rapid growth. Yet, there remains little understanding as to why some countries specialise in service exports (and in some service export categories), while others may not. Are the existing trade theories accurate in explaining the comparative advantage some countries enjoy in service exports?

Using an UNCTAD dataset containing 146 countries' services trade data, this paper identifies which countries have a comparative advantage in the export of travel services, acting as a proxy for tourism expenditure. Consequently, the paper seeks to identify the sources of this comparative advantage. We include the standard explanatory variables (factors of production, including natural environment) for Ricardian comparative advantage, plus measures of infrastructure, health, safety and security, tourism prioritization, and various dummy variables. We also develop and test new variables, including a neighbourhood variable which measures the benefits obtained from regional tourism clusters. Our results have important policy implications; it is clear that the natural environment has a large positive and significant impact on a country's revealed comparative advantage, as do transport endowments (a measure of relative accessibility) and the neighbourhood variable. These findings correspond to the predictions of the neoclassical trade theories (namely Heckscher-Ohlin) and to some extent the new trade theories (Krugman).

TRAVEL SERVICES AND HECKSCHER-OHLIN

Service exports consist of a diverse range of items. The fifth edition of the International Monetary Fund Balance of Payments Manual proposes that service trade statistics be collected for 11 sectors: transportation; travel; communication services; construction services; insurance services; financial services; computer and information services; royalties and licence fees; other business services[2]; personal, cultural and recreational services; and government services (WTO 2006:10).

Unlike other traded service industries, travel services are defined by the *user* of the service and not the type of good or service sold: The consumer (user or traveller) moves to a different country to obtain goods and services.[3] Travel services entail all goods and services that are acquired by travellers in an economy during visits of less than one year (except patients and students who may exceed the one-year limit) (UN 2002). These services exclude transportation services provided by carriers not resident in the particular economy being visited, as well as international carriage of travellers, both of which are included under passenger services in the transportation service industry (UN 2002). Also excluded are purchases of goods for resale in the traveller's home economy or elsewhere.

Table 1 provides the breakdown of total service exports by type. Transport, travel and other business services cover more than 75% of total service exports, with travel service exports the largest contributor with 28%.[4]

[2] The category 'other business services' includes merchanting and other trade-related services, operational leasing services, and miscellaneous business, professional and technical services (UNCTAD, 2008).
[3] Tourism, often thought to be a synonym, is not equivalent to travel services. Travel services includes tourism – which only consists of Mode 2 trade – but also trade in the other three modes. Tourism (Mode 2) is, however, often used as a proxy for travel service exports, and vice versa. For a comprehensive definition of travel services, consult the United Nations Manual on Statistics of International Trade in Services (2002:37–39).
[4] In the dataset that we use, these categories are also the most reported per country and therefore the most reliable estimates, with 145 countries for transport, 146 for travel and 134 for other business services.

TABLE 1: Size of Service Exports by Sector, 2005

Service sector	Obs	Exports (US$)	% of exports	Country average (US$)	% of country average
Transport	146	561980.2	23%	3849.179	21%
Travel	147	675373.6	28%	4594.378	24%
Communications	127	57439.2	2%	452.2772	2%
Construction	88	49485.8	2%	562.3386	3%
Insurance	130	49733.8	2%	382.5677	2%
Financial services	105	163505.4	7%	1557.194	8%
Computer and information	101	108259.1	4%	1071.872	6%
Royalties and licence fees	91	129057.1	5%	1418.21	8%
Other business services	136	619259.9	25%	4553.382	24%
Personal, cultural and recreational	91	29641.3	1%	325.7286	2%
Total services		2443735		18767.13	

SOURCE: UNCTAD (2008), own calculations.

The growth of the service industry over the last three decades is one of the striking trends in international trade. While merchandise trade has grown by 7% per annum since 1980, the services industry has achieved close to 8% per annum growth (UNCTAD 2008). Both merchandise and service trade has exceeded growth of 10% per annum in the last decade. Because of its contribution to total service exports, travel service exports has played a vital role in explaining these high growth rates. Using the number of tourists travelling abroad as proxy for travel service exports, worldwide tourists have increased from 536 million to 924 million between 1995 and 2008, an average increase of 4.28% per annum.[5] Expenditure figures, which are less reliable, exhibit roughly similar trends.

While not all countries have benefited from this growth, poorer countries have not been left behind. Asian and African countries, in particular, have achieved growth rates above the world average (Fourie 2009). A growing body of research shows that the travel service industry is an important catalyst in both developed and developing countries growth and development strategies (Balaguer and Contavella-Jordá 2002; Kima et al. 2006; World Bank 2006; Nowak et al. 2007; Lee and Chang 2008; Sequeira and Nunes 2008). So understanding the determinants of travel service exports, or rather, the sources that give rise to a country's comparative advantage in travel service exports, may yield important policy insights.

There have been few attempts to gain insight into these determinants. The tourism literature – in contrast to the trade literature – follows, with few exceptions, a demand-side approach (Lim 1997), primarily to forecast tourism flows. This bias has been pointed out recently by Zhang and Jensen (2007). In a seminal contribution, they follow a supply-side approach to explain tourism flows, finding strong support that existing (merchandise) trade theories can explain tourism. According to

[5] The worldwide recession of 2009 has however impacted the tourism industry which is not yet reflected in the data. See UNWTO (2009) and Blanke and Chiesa (2009)

Zhang and Jensen (2007), key supply-side determinants to explain tourism flows include natural endowments, technology and infrastructure.[6]

The international trade literature, too, is cautious in its treatment of trade theories in explaining services trade. Deardorff (1984; 1985) and Hindley and Smith (1984) were the first to argue that substituting services for goods in the standard Heckscher-Ohlin-type models did not invalidate the comparative advantage proposition that a country will expert those goods (services) for which the factors of production are relatively abundant locally. Since then, few papers have attempted to test these hypotheses, with most work restricted to evaluating the performance of service sectors, most notably the high-tech service sectors such as IT, insurance and financial services (Seyoum 2007). In tourism, or travel services, a same trend emerges (Peterson 1988), with few attempts to understand the determinants of a tourism comparative advantage. The exception is a recent contribution by Sahli (2006). He includes a measure of comparative advantage – the revealed comparative advantage, first derived by Balassa (1965) – as dependent variable, with supply- and demand-side variables as possible causes. Sahli's (2006) findings show that "tourism remains to a large extent governed by the existence of natural resources". He also finds evidence to support the influence of other factors, including technology, the level of domestic demand and the transport infrastructure.

These results seem to support the notion that international trade theories can – at least partially – explain why some countries export travel services and others not, i.e. why some countries exhibit a comparative advantage in travel service exports. The rest of this study proceeds to untangle the determinants of such exports.

COMPARATIVE ADVANTAGE IN TOURISM

The theory of comparative advantage is derived from David Ricardo's insight into the fact that trade benefits countries that specialise in the production of goods and services with the lowest opportunity costs. Empirically, comparative advantage is revealed through the Balassa index (Balassa 1965):

$$RCA_{ij} = \frac{X_{ij}/\sum_i X_{ij}}{\sum_j X_{ij}/\sum_i \sum_j X_{ij}}, \qquad (1)$$

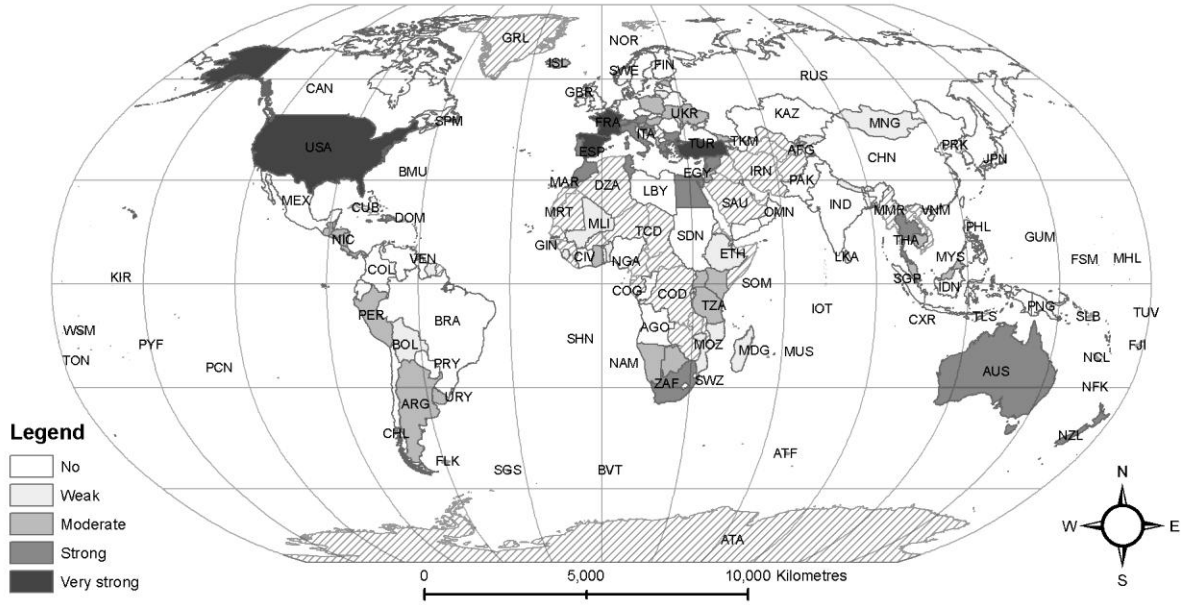
where X_{ij} represents exports of sector i from country j. While various alternative measures have been proposed in the literature (Vollrath 1991; Laursen 1998; Hoen and Oosterhaven 2006), the Balassa index remains the most popular (Cai and Leung, 2008). In a more recent paper, however, Yu, Cai and Leung (2009) develop a measure that allows for more precise and consistent comparisons across time, countries and commodities. It is this measure, the normalized revealed comparative advantage (NRCA), which is used as dependent variable in the analysis:

[6] A similar argument is made using resource-based theories (within the field of strategic management) to explain the competitiveness of tourism destinations. See, for example, Melián-González and García-Falcón (2003).

$$NRCA_{ij} = \frac{X_{ij}}{\sum_i \sum_j X_{ij}} - \frac{(\sum_i X_{ij})(\sum_j X_{ij})}{(\sum_i \sum_j X_{ij})^2}, \quad (2)$$

We calculate the 2005 NRCA for all 146 countries in the UNCTAD Handbook of Statistics 2006-07 (UNCTAD 2008). Countries are ranked by this measure in Appendix A.[7] Figure 1 highlights those countries that exhibit a revealed comparative advantage in travel service exports in 2005. What is clear from the map is the dark band of countries of the Mediterranean (and others enjoying a Mediterranean climate) that reveal a strong comparative advantage. The USA, Spain, Turkey and France are the only countries that fall within the "Very Strong" category. They are followed by a larger group of countries revealing a "Strong" comparative advantage for travel service exports, a list that includes a diverse range of countries – from developed economies like Italy, Australia and Switzerland, larger developing economies like Egypt, South Africa and Thailand, to island economies such as Macau SAR, Cyprus and the Bahamas. The full list of countries and their NRCA score appear in Table 3 in the appendix.

Figure 1: The NRCA performance of countries



[7] For a number of developing countries – especially in Africa – travel service export data is not available. This is unfortunate as Fourie (2009) points out that African countries tend to reveal a high comparative advantage in travel service exports. To some extent this is validated in Figure 1 by the strong NRCA of South Africa, Egypt, Tunisia and Morocco, and the moderate NRCA of a number of small (and poor) African countries, including Uganda, Rwanda, Tanzania, Mali and the Gambia.

THE SOURCE OF COMPARATIVE ADVANTAGE

Let us return to the original question: why would a country have a comparative advantage in exporting travel services? The traditional trade theories posit that a country would attain a comparative advantage in a good because of its greater productivity in manufacturing the good (Ricardian) or because the country is relatively well-endowed with the factors of production that are used most-intensively in the production of the good (Heckscher-Ohlin). Applying this to services, countries would specialise in a specific service export given cross-country differences in technology or endowments, usually referring to capital and labour. Strict assumptions characterize these theories; Deardorff (2005) provides a succinct overview of the limitations of comparative advantage analysis. Finding insufficient empirical support for these theories (i.e. the Leontief paradox), the new trade theories provide alternative explanations for the growth in trade, emphasising economic geography and the love-of-variety, incorporating increasing returns to scale and transport costs, and examining the role of multinational corporations and industry clusters to explain a country's comparative advantage (Krugman 1979). In addition, Linder (1961) had suggested that domestic preferences may determine a country's export bundle.

Which of these theories is relevant for the travel services industry? Zhang and Jensen (2007) note that, in theory, all may have some relevance: price competition between countries (Ricardian comparative advantage), the natural environment such as sun, sea and sand (Heckscher-Ohlin), international hotel chains (multinational corporations), tourism clusters (agglomeration) are all factors that may drive a country's comparative advantage in the travel service industry. One may want to add to this list. Why do countries export tourist services relative to other exports (thus attaining a comparative advantage)? Geography, business regulations, transportation costs, climate, history and culture, macroeconomic variables, government policies, and a host of other factors may be applicable. This paper attempts to answer empirically which of these determinants explain a country's comparative advantage.

To pin down the economic determinants of comparative advantage in a 2x2x2 model, the Heckscher-Ohlin theory states that comparative advantage, under certain strong conditions, will arise in a commodity if resource endowments used in the production of that commodity are relatively abundant in that country compared to the other country. To test this theory for travel service exports we model cross-county differences in revealed comparative advantage as a function of relative resource endowments, while controlling for other factors. In general then, the Hecksher-Ohlin theory proposes an explanatory framework where a country's comparative advantage is a function of its resource endowments. Equation (3) formalises this idea where for country *i*, its comparative advantage in good *j* is determined by K_i capital, L_i labour, N_i natural environment and R_i a collection of vectors of other possible sources.

$$NRCA_j = F(K_i, L_i, N_i, R_i) \tag{3}$$

In the light of the exploratory nature of this analysis, this section analyses equation (3) as a simple linear relationship (4).

$$NRCA_j = C + K_i + L_i + N_i + R_i + \varepsilon_i \qquad \varepsilon_i \sim ID(0, \sigma_i^2) \qquad (4)$$

Because the data is subject to random variation, the models proposed above should be treated stochastically. The data in model (4) gives rise to a stochastic disturbance, the information of which is contained in ε_i. Given the stochastic nature of the data, the relationships between explanatory variables on the right-hand side and NRCA on the left-hand side of (4) have to be estimated with the nature and characteristics of the data in mind. Translating the former consideration of the data into a statistically adequate econometric model will ensure that the results reliably show the relative importance of the different economic drivers of cross-country differences in NRCA.

Because national economies differ widely in size and structure, the nature of the randomness associated with the set of observations obtained from each country is most likely not identical across all countries. In models (4) this means that although the disturbance might be independently distributed between countries, it is probably not identical. In matrix notation these models take the general form $y = X\beta + \varepsilon, \varepsilon \sim ID(0, \sigma_i^2)$. We assume that the disturbance is independently distributed and that regressors are uncorrelated with the disturbances in these models. If no pair vectors of explanatory variables are perfectly correlated, that is if the data matrix has full rank, and if disturbances are identically distributed then OLS is unbiased, consistent and the most efficient estimator for the class of models. But as indicated, the disturbances in our model are most likely not identically distributed and our estimation procedure will control for this departure from the Guass-Markov assumptions to produce parameter estimates that are the best possible given our statistical assumptions.

OLS parameter estimates and the resulting estimates of their variance can be used for inference when disturbances are not identically distributed or heteroskedastic in an unknown way, if we estimate the variance-covariance matrix in a way that takes the nature of the disturbances into account. Inferences about parameters are based on the fact that the vector $\hat{\beta} - \beta$ has zero mean and covariance matrix (5) where $E(\varepsilon\varepsilon^T) = \Omega$,

$$(X^T X)^{-1} X^T \Omega X (X^T X)^{-1}. \qquad (5)$$

Based on earlier statistical work (Eicker 1963; Eicker 1967; Hinkley 1977), White (1980) shows that by assuming that disturbances are not identically distributed $E(\varepsilon_i^2) = \sigma_i^2$, and constructing an estimate $\widehat{\Omega} = diag(\widehat{\varepsilon_1^2}, \widehat{\varepsilon_2^2}, \dots, \widehat{\varepsilon_i^2})$ based on error terms from the OLS regression, and replacing it with Ω in (5) we can estimate the variance-covariance matrix consistently. This yields so-called robust standard errors and hence will prevent the researcher from being overconfident in the accuracy of the results. Although this gives the right answer as the sample size grows to infinity, the estimates of the variance may be underestimated in finite samples. Also, this procedure does not correct for the fact that OLS errors or residuals tend to be too small (MacKinnon & White, 1985). To control for these problems we employ another well defined statistically robust method of estimating (5), namely the 'jackknife' (Efron 1979; Efron 1981; Efron and Stein 1981). Athough both of these methods give the same answer asymptotically, theoretical work by Cheser (1989) and

simulations by Long and Ervin (2000) suggests that using the jackknife performs better than other estimators in samples smaller than 250.

Jackknife standard errors are computed differently based on an alternative way of thinking about randomness in the world and how to deal with it in our statistical model. White's robust standard errors are calculated by supposing the world to play itself out again and again always with the same systematic information in the data, but each time with a different random component. The jackknife recomputes model estimates as many times as there are observations and uses the variability of the recomputed estimates as an estimate of the variability of the original estimator (MacKinnon and White 1985). In this way, the world is supposed to emerge with all of its randomness, and our method supposes that each time the world emerges in the same way as it did before, but omitting one country. We can do this because the disturbances are independent between countries. So, in the context of our assumptions, armed with these model specifications and robust estimation methods in an attempt to deal with model and parameter uncertainty, we approach the data.

The world development indicators dataset forms the backbone of our dataset. A complete list of the variables used is included in Appendix B.

TABLE 2: The determinants of revealed comparative advantage in tourism

Variables	Reg 1 robust		Reg 2 robust		Reg 3 robust		Reg 4 robust		Reg 5 robust		Reg 6 robust		Reg 7 robust		Reg 8 robust		Reg 9 robust		Reg 10 robust		Reg 11 robust	
constant	-0.1099406	*	-0.0383438		-0.1364931	***	-0.1064806	*	-0.8634338	***	0.0024801		0.3121664		-0.1089103	*	-0.0730247		-0.1181863	*	-0.0648833	
GFCF	-1.66E-12				-3.23E-12	**	-1.73E-12		-2.2E-12		-5.93E-12	***	-1.65E-12		-1.66E-12		-1.61E-12		-1.67E-12		-1.57E-12	
Employed	-6.01E-07				0.000000901		-0.00000035		0.000000195		-0.00000392		0.00000044		0.000000629		-8.97E-07		-0.000000595		-0.000000874	
GPC			-0.0014942																			
Natural heritage	0.0705826	***	0.050155		0.0627583		0.0878787	***	0.0764902	***	0.0755503	*	0.0771257	***	0.0694403	***	0.0849968	***	0.0704075	***	0.0721242	***
Cultural heritage	0.0032052		-0.0176887		0.0178768	*	0.003432		0.0135387		0.0528575	***	-0.0016956		0.002898		0.005274		0.0035261		0.0054007	
Warm water	0.0497282		0.0072805		0.0639823		0.0396477		0.0459393		0.1091356		0.0340583		0.0574142		0.0657563		0.0526802		0.0434907	
Coast	-0.00000981	***	-0.00000865	***	-0.00000872	***	-0.00000891	***	-0.00000951	***	0.00000411		-0.0000102	***	-0.00000977	***	-0.0000098	***	-0.00000967	***	-0.00000927	***
Neighourhood	0.1905283	**	0.2218401	***	0.1627834	**	0.1822649	*	0.1532744		-0.042544		0.2102279	**	0.1895749	**	0.1651088	*	0.1863908	**	0.1708043	*
Transport capacity	0.0032863	**	0.0039878	***	0.0031756	**	0.0033732	***	0.0033337	***	0.0032435	**	0.0035196	***	0.003262		0.0034636	***	0.0032825	**	0.0034466	**
Mediterranean	0.7643517	***	0.9119434	***	0.9444804	***	0.7511713	***	0.6892478	***	0.4859107	**	1.115225	***	0.7637487	***	0.747865	***	0.7660766	***	0.7274849	***
Technology					-0.0032953																	
Land area							-3.22E-08	*														
Affinty for travel									0.1387168	**												
Human Capital											-0.0895163											
Primary completion											0.0016742											
Immunisation													-0.0048178	*								
HIV prevalence													0.00000299									
TB prevalence													-0.0000503									
Pollution (CO2)															6.14E-09							
Democracy																	0.0042142					
Corruption																	-0.0225603					
Crime																	-0.0005101					
Island																			-0.0159566			
Africa																			0.0254536			
Tropical																			0.0058036			
Exchange rate																					0.000000206	
PPP																					-0.1216653	
Observations	151		151		133		151		115		92		117		149		100		151		134	
R-squared	0.4675		0.408		0.5992		0.474		0.5053		0.6134		0.5443		0.4701		0.5041		0.4683		0.4818	

Table 4: Regression results for travel service exports using White robust standard errors.
Source: Own calculations using Stata 10 and the UNCTAD Handbook of Statistics 2007 (2008)
*** *Significance at 1%*
** *Significance at 5%*
* *Significance at 10%*

The results are reported in Table 2. The results support the central hypothesis that the natural environment is strongly correlated with a large revealed comparative advantage in tourism, controlling for various other factors. A number of indicators of natural environment are used in the analysis. While cultural heritage and warm water are positive, but statistically insignificant, natural heritage (with the number of UNESCO World Heritage sites used as proxy) are consistently positive and both economically and statistically significant. A Mediterranean dummy is also highly economically and statistically significant, supporting the natural environment's contribution to a large tourism RCA. When the Mediterranean dummy is removed (not shown here), the cultural and natural heritage coefficients rise significantly. The neighbourhood effect is also positive with a large coefficient. It is also statistically significant in 9 of the 11 regressions. This suggests a key role for 'clusters' or agglomeration effects in the tourism industry across countries. Transport capacity, although with a smaller coefficient, is also statistically significant throughout the analysis. This supports the notion that relative transport costs matter; a landlocked country with expensive access to the sea is more likely to specialise in tourism than a country with efficient port infrastructure. Only one other variable is found to be both economically and statistically significant: a country's affinity for travel, measured as a country's tourism expenditure and receipts as percentage of GDP. This indicator is, however, highly endogenous ,and although it acts as a proxy for local demand, causality should not be inferred.

On the whole, then, the results reported in Table 2 support the applicability of the augmented Heckscher-Ohlin framework to travel service exports. Natural environment is found to be consistently positive and significant; controlling for other factors, more natural resources in a country would increase the likelihood that the country would reveal a comparative advantage in travel service exports. While capital and labour do not influence the comparative advantage of a country (both are economically and statistically insignificant), the large and statistically significant coefficient on natural environment suggests that, ceteris paribus, a country with a large endowment of natural resources should specialise in tourism services.

Other factors also contribute to a country's revealed comparative advantage in travel service exports. Following Linder's hypothesis, a country's local demand in tourism increases the comparative advantage of exporting travel services (included in the regressions as an affinity for tourism and travel variable). Finally, tourism infrastructure also adds to the comparative advantage. The index includes the availability of hotels and tourism services and could possibly be thought of as supporting the new trade theory of agglomeration in economic production. However, this conclusion is likely implausible, as tourism infrastructure is most likely endogenous and would result in biased estimates.

CONCLUSIONS

Following the rise of the knowledge-economy and the consequent growth of knowledge exports relative to natural resource exports, the Heckscher-Ohlin theory has seemingly lost its empirical relevance. This paper finds evidence that the Heckscher-Ohlin hypothesis still has validity if augmented to include natural environment as an additional factor of production. We find that being

endowed with natural resources increases a country's relative or comparative advantage in exporting tourism services. The intuition is simple: following the law of comparative advantage, a country with a favourable natural environment should specialise in tourism exports rather than exporting other goods or services. The empirical results support this conclusion. Capital and labour add no additional advantage or disadvantage for travel service exports. Other factors may also add to exporting tourism relative to other exports, including local demand for tourism and tourism infrastructure.

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Appendix A: Countries and their comparative advantage

Ranking	Country	Code	Comparative advantage	NRCA
1	United States of America	USA	Very strong	0.0026102
2	Spain	ESP	Very strong	0.0025692
3	Turkey	TUR	Very strong	0.0010212
4	France	FRA	Very strong	0.0010083
5	Greece	GRC	Strong	0.0008405
6	Italy	ITA	Strong	0.0008342
7	Australia	AUS	Strong	0.0007564
8	China, Macao SAR	MAC	Strong	0.0005861
9	Croatia	HRV	Strong	0.0005053
10	Austria	AUT	Strong	0.0004746
11	Egypt	EGY	Strong	0.000436
12	Lebanon	LBN	Strong	0.0003828
13	Portugal	PRT	Strong	0.000382
14	South Africa	ZAF	Strong	0.0003151
15	Morocco	MAR	Strong	0.0002865
16	New Zealand	NZL	Strong	0.0002589
17	Dominican Republic	DOM	Strong	0.0002364
18	Thailand	THA	Strong	0.0002056
19	Bahamas	BHS	Strong	0.0001514
20	Cyprus	CYP	Strong	0.0001508
21	Switzerland	CHE	Strong	0.000142
22	Syrian Arab Republic	SYR	Strong	0.0001314
23	Bulgaria	BGR	Strong	0.0001227
24	Tunisia	TUN	Strong	0.0001069
25	Jamaica	JAM	Strong	0.0001063
26	Costa Rica	CRI	Moderate	0.0000916
27	Jordan	JOR	Moderate	0.0000861
28	Aruba	ABW	Moderate	0.0000666
29	Barbados	BRB	Moderate	0.0000634
30	Ukraine	UKR	Moderate	0.0000626
31	Netherlands Antilles	ANT	Moderate	0.000061
32	Albania	ALB	Moderate	0.00006
33	Mauritius	MUS	Moderate	0.0000532
34	United Republic of Tanzania	TZA	Moderate	0.0000528
35	Cambodia	KHM	Moderate	0.0000495
36	Slovenia	SVN	Moderate	0.0000494
37	Poland	POL	Moderate	0.0000489
38	Guatemala	GTM	Moderate	0.0000471
39	Ghana	GHA	Moderate	0.0000467
40	Panama	PAN	Moderate	0.0000442

41	Malta	MLT	Moderate	0.0000428
42	Luxembourg	LUX	Moderate	0.0000331
43	Estonia	EST	Moderate	0.000029
44	Uruguay	URY	Moderate	0.0000271
45	Honduras	HND	Moderate	0.0000265
46	Bosnia and Herzegovina	BIH	Moderate	0.0000264
47	Saint Lucia	LCA	Moderate	0.0000255
48	Uganda	UGA	Moderate	0.0000244
49	Kenya	KEN	Moderate	0.0000239
50	Antigua and Barbuda	ATG	Moderate	0.0000238
51	El Salvador	SLV	Moderate	0.0000236
52	Peru	PER	Moderate	0.0000235
53	Bahrain	BHR	Moderate	0.0000227
54	Botswana	BWA	Moderate	0.0000222
55	Maldives	MDV	Moderate	0.0000207
56	Hungary	HUN	Moderate	0.0000206
57	Malaysia	MYS	Moderate	0.0000196
58	Argentina	ARG	Moderate	0.0000178
59	Namibia	NAM	Moderate	0.0000175
60	Belize	BLZ	Moderate	0.0000141
61	Georgia	GEO	Moderate	0.0000125
62	Seychelles	SYC	Moderate	0.0000122
63	Nicaragua	NIC	Moderate	0.0000114
64	Iceland	ISL	Moderate	0.0000112
65	Lithuania	LTU	Weak	0.00000978
66	Cape Verde	CPV	Weak	0.00000841
67	Mongolia	MNG	Weak	0.00000774
68	Saint Kitts and Nevis	KNA	Weak	0.00000766
69	Saint Vincent and the Grenadines	VCT	Weak	0.00000748
70	Anguilla	AIA	Weak	0.00000636
71	Madagascar	MDG	Weak	0.00000628
72	Haiti	HTI	Weak	0.00000614
73	Mali	MLI	Weak	0.00000578
74	Armenia	ARM	Weak	0.00000571
75	Samoa	WSM	Weak	0.00000555
76	Vanuatu	VUT	Weak	0.00000531
77	Nepal	NPL	Weak	0.00000527
78	Ethiopia	ETH	Weak	0.00000521
79	Grenada	GRD	Weak	0.000005
80	Bolivia	BOL	Weak	0.00000499
81	Benin	BEN	Weak	0.00000492
82	Gambia	GMB	Weak	0.0000041
83	Sierra Leone	SLE	Weak	0.00000407

84	Dominica	DMA	Weak	0.0000039
85	Rwanda	RWA	Weak	0.00000279
86	Moldova	MDA	Weak	0.00000211
87	Kyrgyzstan	KGZ	Weak	0.00000185
88	Suriname	SUR	Weak	0.00000154
89	Mozambique	MOZ	Weak	0.00000141
90	Tonga	TON	Weak	0.000000981
91	Montserrat	MSR	Weak	0.000000647
92	Sri Lanka	LKA	Weak	0.000000508
93	Guyana	GUY	No	-0.000000192
94	Burundi	BDI	No	-0.000000271
95	Lesotho	LSO	No	-0.0000006
96	Djibouti	DJI	No	-0.000000663
97	Togo	TGO	No	-0.00000175
98	Latvia	LVA	No	-0.00000385
99	Paraguay	PRY	No	-0.00000388
100	The former Yugoslav Republic of Macedonia	MKD	No	-0.00000403
101	Swaziland	SWZ	No	-0.00000427
102	Tajikistan	TJK	No	-0.00000436
103	Colombia	COL	No	-0.00000462
104	Ecuador	ECU	No	-0.00000871
105	Philippines	PHL	No	-0.00000911
106	Czech Republic	CZE	No	-0.0000119
107	Sudan	SDN	No	-0.0000139
108	Yemen	YEM	No	-0.0000145
109	Papua New Guinea	PNG	No	-0.0000149
110	Azerbaijan	AZE	No	-0.0000152
111	Congo	COG	No	-0.0000187
112	Côte d'Ivoire	CIV	No	-0.0000287
113	Israel	ISR	No	-0.0000299
114	Bangladesh	BGD	No	-0.0000393
115	Mexico	MEX	No	-0.0000416
116	Oman	OMN	No	-0.0000448
117	Romania	ROU	No	-0.0000561
118	Belarus	BLR	No	-0.0000562
119	Indonesia	IDN	No	-0.0000626
120	India	IND	No	-0.0000655
121	Pakistan	PAK	No	-0.0000695
122	Kazakhstan	KAZ	No	-0.0000723
123	Angola	AGO	No	-0.0000963
124	United Kingdom of Great Britain and Northern Ireland	GBR	No	-0.000102
125	Libyan Arab Jamahiriya	LBY	No	-0.0001053
126	Chile	CHL	No	-0.0001175

127	Denmark	DNK	No	-0.0001295
128	Sweden	SWE	No	-0.0001515
129	Finland	FIN	No	-0.0001805
130	Venezuela (Bolivarian Republic of)	VEN	No	-0.0001901
131	Kuwait	KWT	No	-0.0001984
132	Nigeria	NGA	No	-0.0002225
133	Brazil	BRA	No	-0.0002661
134	Norway	NOR	No	-0.0002938
135	Ireland	IRL	No	-0.0003423
136	China, Taiwan Province of	TWN	No	-0.000556
137	Canada	CAN	No	-0.0006713
138	Russian Federation	RUS	No	-0.0006763
139	China, Hong Kong SAR	HKG	No	-0.0006847
140	Singapore	SGP	No	-0.0007397
141	Belgium	BEL	No	-0.0008808
142	Republic of Korea	KOR	No	-0.0009408
143	China	CHN	No	-0.0012322
144	Netherlands	NLD	No	-0.0012423
145	Japan	JPN	No	-0.0020124
146	Germany	DEU	No	-0.0024941

Appendix B: Variables used in the regression analysis

Symbol	**Description**	**Expected Impact**	**Source**
GPC	Nominal Gross Domestic Product per Capita	Variable acts as a proxy to indicate whether or not a country's wealth matters for trade in services. Expected sign: unsure.	UNCTAD Handbook of Statistics (2008)
GFCF	Gross fixed capital formation (1000 current US dollars). It includes land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings.	Variable will indicate whether service and goods exports are capital intensive or not. Expected sign: negative.	World Development Indicators (2006) database retrieved from Nationmaster
Population	Population	Variable will indicate whether goods exports are labour intensive. Expected sign: positive.	World Development Indicators (World Bank, 2006c)
Employed	Employed labour (general level in thousands)	Variable will indicate whether service exports are labour intensive. An alternative measure to population. Expected sign: positive.	International Labour Organisation, LABORSTA Labour Statistics Database (2009)

intensity_empl	Ratio of GFCF over employed	Variable acts as a measure of relative intensity between capital and employed labour.	Created
intensity_pop	Ratio of GFCF over population	Variable acts as a measure of relative intensity between capital and the population.	Created
TB deaths	Deaths due to tuberculosis among HIV-negative people (per 100 000 population)	Variable acts as 1 of 5 proxies of health to indicate whether or not a country's travel services exports depends on health concerns. Expected sign: negative if significant.	World Health Organisation (2009)
TB incidence	Incidence of tuberculosis (per 100 000 population per year)	Variable acts as 1 of 5 proxies of health to indicate whether or not a country's travel services exports depends on health concerns. Expected sign: negative if significant.	World Health Organisation (2009)
TB prevalence	Prevalence of tuberculosis (per 100 000 population)	Variable acts as 1 of 5 proxies of health to indicate whether or not a country's travel services exports depends on health concerns. Expected sign: negative if significant.	World Health Organisation (2009)
HIV prevalence	Prevalence of HIV among adults aged >=15 years (per 100 000 population)	Variable acts as 1 of 5 proxies of health to indicate whether or not a country's travel services exports depends on health concerns. Expected sign: negative if significant.	World Health Organisation (2009)
Immunization	Children 1 year old immunized against measles, percentage	Variable acts as 1 of 5 proxies of health to indicate whether or not a country's travel services exports depends on health concerns. Expected sign: negative if significant.	World Health Organisation (2009)

Primary completion	Primary completion rate	Variable acts as a measure of basic schooling. Expected sign: positive if significant.	Millennium Goals Development Report (2009)
Human capital	A measure of Human Capital	Variable acts as a measure of the level of human capital development within a country. Expected sign: positive if significant.	The Travel & Tourism Competitiveness Report (Blanke and Chiesa 2009)
Pollution (CO2)	Carbon dioxide emissions (CO2), thousand metric tons of CO2 (CDIAC)	Variable measures the degree of pollution in each country. Expected sign: negative.	Millennium Goals Development Report (2009)
Natural heritage	Number of Natural World Heritage sites for each country	Variable will indicate whether travel service exports are natural resource intensive. Expected sign: positive.	The Travel & Tourism Competitiveness Report (Blanke and Chiesa 2009)
Cultural heritage	Number of Cultural World Heritage sites for each country	Variable will indicate whether travel service exports depend on cultural resources. Expected sign: positive.	The Travel & Tourism Competitiveness Report (Blanke and Chiesa 2009)
Warm water	A measure of whether or not the country experiences a warm current ocean.	Variable acts as a proxy for the natural environment. Expected sign: positive.	Created
Technology	Variable is an index created by normalising and adding: Telephone lines per 100 population, Mobile cellular telephone subscriptions per 100 population, Internet users per 100 population, and Personal computers per 100 population.	Variable acts as a proxy for technology. Expected sign: positive if significant.	Millennium Goals Development Report (2009)
Democracy	Democracy index. Index Ranging from 7 (High Levels of Liberties) to 1 (Low levels).	A measure of civil and political liberties within a country. Variable acts as 1 of 2 proxies for social order. Expected sign: positive if significant.	Freedom House, Freedom in the World 2000-2001, New York: Freedom House, 2001 retrieved from Nationmaster
Corruption	Corruption index. A CPI Score relates to perceptions of the degree of corruption as seen by business people and country analysts and ranges between 10 (highly clean) and 0 (highly corrupt). Includes police corruption, business corruption, political corruption, etc.	Variable acts as1 of 2 proxies for social order. Expected sign: negative	Transparency International retrieved from Nationmaster

Crime	Intentional Homicides per 100,000 People, 2000-2004. Because of differences in the legal definition of offences, data are not strictly comparable across countries. Data refer to a year from 2000 to 2004, and reported in 2007, but in some cases from a different year if otherwise not available. In some cases the intentional homicide rate differs from the standard definition or refers to only part of a country.	Variable acts as a relatively poor proxy for crime in each country considered, and how crime effects travel service exports. Expected sign: negative if significant.	International Center for Policy Studies (2007)
Coast	Coastline in kilometers	A measure of the proportion of boundary between the land (including islands) and the sea. An additional measure of natural environment. Expected sign: positive.	CIA World Factbook retrieved from Nationmaster
Transport capacity	An index for the transport capacity for each country in 2004. It created by dividing the number of airports by the number of ports and terminals. A value of 0.5 has been used where there are no ports. Total number of airports with paved runways (concrete or asphalt surfaces). Major ports and terminals refer to the amount of cargo tonnage shipped through the facilities on an annual basis. In some instances, the number of containers handled or ship visits were also considered.	A measure of transportation facilities and capacity. This variable will be used for travel and tourism services. Expected sign: positive.	CIA World Factbooks retrieved from Nationmaster
PPP	Purchasing power parity conversion factor, 2005, is the number of units of a country's currency required to buy the same amount of goods and services in the domestic market as a U.S. dollar would buy in the United States.	A measure of the ability of individuals to spend in a foreign country. Also provides a measure of relative importing and exporting power. Expected sign: unsure.	World Development Indicators (2006) database retrieved from Nationmaster
Exchange rate	Official exchange rate, 2005, refers to the exchange rate determined by national authorities or to the rate determined in the legally sanctioned exchange market. It is calculated as an annual average based on monthly averages (local currency units relative to the U.S. dollar).	A measure of the ability of individuals to spend in a foreign country. Also provides a measure of relative importing and exporting power. Expected sign: negative.	World Development Indicators (2006) database retrieved from Nationmaster
Land area	Land area in square kilometres	A measure of the size of each country considered within the sample. Expected sign: positive.	World Heritage data (1999).
Island	Island dummy (1=yes, 0=no)	An indication of whether or not the country is an island. Expected sign: positive.	Created

Affinity for travel	Affinity for Travel and Tourism. Tourism expenditure and receipts as a percentage of GDP.	A variable that stands in proxy for domestic demand as an explanation of a country's comparative advantage (Linder, 1961). Expected sign: positive.	The Travel & Tourism Competitiveness Report (Blanke and Chiesa 2009)
Africa	African dummy (1=yes, 0=no)	A dummy variable indicating whether or not the country is located in Sub-Saharan Africa or not	Created
Tropical	Tropical climate dummy (1=yes, 0=no)	A dummy variable indicating whether or not the country is in a tropical climate	Created
Mediterranean	Mediterranean dummy (1=yes, 0=no)	A dummy variable indicating whether or not the country is located in the Mediterranean	Created