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Economic Development and International Travel: A Cross-Country Panel Analysis *

Melody Lo
Department of Economics, College of Business,
University of Texas at San Antonio,
One UTSA Circle, San Antonio, TX 78249, USA.
Email: melody.lo@utsa.edu

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Melody Lo
Department of Economics, College of Business,
University of Texas at San Antonio,
One UTSA Circle, San Antonio, TX 78249, USA.
Email: melody.lo@utsa.edu

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Abstract

This paper investigates the impact of economic development on international travel using data from 134 countries. A panel cointegration analysis provides evidence that the size of positive impact diminishes (i.e., international travel becomes more of a necessity than a luxury) throughout the process of economic development, which is in contrast to the documented stylized international pattern for aggregate import data.

Keywords: Economic development; International travel; Panel cointegration; Income elasticity; Import demand

JEL Classification: C23; F10; O10

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1 Introduction

International tourism is essentially a form of international trade. The most recent data from the World Bank's World Development Indicators (WDI) database shows that in 2006 international tourism accounted for more than 10% of the world's total international trade. In addition, when considering tourism as a service in international trade exclusively, the share of tourism increased to 30%. Based upon these figures, it follows that international tourism comprises a considerable portion of gross domestic product (GDP) in many open economies given that international trade is an important component for their national income.[1] We thus note that public policy that aims to promote the foreign demand for tourism can play a crucial role in stimulating economic development, and a fundamental understanding of the properties of such demand is essential for effective policymaking. Despite the important role that it has played on the national income, international tourism as a special form of international trade has not been analyzed "separately" from the total international trade data in the economics literature. Applying a panel cointegration methodology, this paper provides initial evidence showing that substantially different properties exist between the total import demand and the import demand for international tourism. In particular, the distinct difference lies in how each type of import demand responds to economic development. The resulting policy implications are discussed.

2 Data, empirical procedures and evidence

We use annual data from both the WDI and the International Monetary Fund's International Financial Statistics (IFS). All data used in our analysis are obtained from the IFS except the international tourism data that is from the WDI. The data covers 134 countries and the period of 1996-2006 for which tourism data is available.

2.1 Preliminary evidence

Since the mid-1980s, the ratio of imports to GDP has been rising in virtually all countries. A straightforward explanation for this rising trend is when countries are in the process of economic development, a larger GDP enables their citizens to afford a larger consumption of imports. For the same reason, one can expect the consumption of foreign travel, a special form of import, to increase with economic development. As economic development is almost synonymous with a rising level of real GDP per capita, in this paper real GDP per capita is used as the proxy for the level of economic development. Fig. 1 presents a clear positive relationship between international travel and economic development when the mean of international tourism expenditure per capita is plotted against the mean of real GDP per capita for the full sample. The associated regression results reported in Table 1 confirm this positive relationship with the significant coefficient of 0.042 (see regression (1)). Further regression analysis reveals that this positive relationship is stronger for countries with a higher level of economic development. To compare the noted positive relationship between higher economic development countries (HEDCs) and lower economic development countries (LEDCs), we divide the full sample into two subsamples using a cutoff point where the real GDP per capita is US$ $10,000$. Regression results in Table 1 show that the subsample of HEDCs has a larger estimated coefficient of 0.056 (see regression (2)) than the subsample of LEDCs that has a coefficient of 0.036 (see regression (3)). Using Cook's Distance tests (Cook, 1977) to exclude outliers from samples, regressions (4) through (6) indicate that the relationships found in regressions (1) through (3) are robust.

<Figure 1 and Table 1 are about here>

With the preliminary evidence presented above, it is understood that similar to the demand for total imports, when economies grow, a relatively large part of discretionary income will be spent on international

[1] Using data from the WDI, for example, net tourism receipts (tourism receipts - tourism expenditures) as a percentage of GDP in 2006 are 57% for Palau, 35% for Maldives, 25% for Bahamas, 18% for Croatia, 16% for Fiji, 9% for Morocco and Jordan, and 5% for Thailand.

travel as the level of disposable income typically rises. Several import studies (e.g., Senhadji 1998) emphasize the importance in examining the time frame of import responses to changes in economic conditions because it can be useful for a variety of policy issues which range from managing import growth to forecasting of imports. The general finding from this line of research is that the changes in real GDP do affect both the short-run and the long-run evolution of the demand for imports. Following the argument in the literature, the rest of this paper investigates the short-run and long-run responses of demand for international travel to economic growth.

2.2 The short-run response

Previous studies (e.g., Senhadji 1998) indicate that the change in real GDP is the most important determinant for the short-run (within a year) evolution of demand for imports. Therefore, we assess the short-run response using the following regression:

$$\triangle ITE_{i,t} = a_1 + b_1 \triangle Y_{i,t-1} + c_1 \triangle ITE_{i,t-1} + \varepsilon_{it}, \tag{1}$$

where $\triangle ITE_{i,t}$ is country i's annual growth rate in international tourism expenditure per capita in period t (from period $t-1$ to period t), and $\triangle Y_{i,t-1}$ is country i's annual growth rate in real GDP per capita in period $t-1$. Note that we include a lag of $\triangle ITE_{i,t}$ as one of the regressors to remove potential serial correlation in the regression. Regressions (7), (8), and (9) in Table 2 report results for the full sample, the subsample of HEDCs, and the subsample of LEDCs, respectively. For the full sample, the significant positive coefficient of 0.02 on $\triangle Y_{i,t-1}$ indicates that expenditure on international travel increases with the improvement in real GDP per capita in the previous year. However, comparing the estimated coefficient on $\triangle Y_{i,t-1}$ between the two subsamples makes it clear that this positive relationship only holds for LEDCs.

<Table 2 is about here>

2.3 The long-run response: Panel cointegration on import demand function

To assess the long-run response, we use a modified import demand function where the dependent variable in a standard import demand function is replaced with import demand for international travel:

$$IMT_{i,t} = a_2 + \alpha RY_{i,t} + \beta RP_{i,t} + \gamma E_{i,t} + \upsilon_{it}, \tag{2}$$

where $IMT_{i,t}$ is country i's demand for international travel in period t measured by the ratio of international tourism expenditures to import prices, $RY_{i,t}$ is the real GDP in period t, $RP_{i,t}$, is the relative price defined as the ratio of domestic prices to import prices in period t, and $E_{i,t}$ is the exchange rate defined as the price of domestic currency per foreign currency in period t. Note that all variables entered in the travel import demand function (2) are logarithms. Also, the data for the import price index (wholesale price index) are used for import prices (domestic prices), and the data for the nominal effective exchange rate are used for the exchange rate. The final sample consists of 33 countries after removing the countries that didn't provide import price index data.[2]

We apply the between dimension group mean panel FMOLS proposed by Pedroni (2001) to both a standard import demand function and a modified import demand function (2) to estimate group α, β, and γ, which provide information on income elasticity, price elasticity, and exchange-rate elasticity, respectively.[3] The estimated α for each function is of particular interest as its relative size provides direct evidence as to whether (and how) import demand for travel evolves differently from total import demand with regard to

[2] These 33 countries include Australia, Austria, Belgium, Canada, Colombia, Denmark, Finland, France, Germany, Greece, Hong Kong, Hungary, Iceland, India, Ireland, Italy, Japan, Jordan, Korea, Mauritius, Morocco, Netherlands, New Zealand, Norway, Oman, Pakistan, Philippines, Poland, Singapore, South Africa, Spain, Sweden, Switzerland, Thailand, United Kingdom, United States, and Venezuela.

[3] A precondition for the existence of cointegration relation in Eq. (2) is that all four variables ($IMT_{i,t}$, $RY_{i,t}$, $RP_{i,t}$, and $E_{i,t}$) are nonstationary (i.e. $I(1)$). Using the panel unit root test developed by Levin, Lin and Chu (2002), we find the precondition is met.

economic development. The following discussion will include regression analyses for the full sample, as well as the subsamples for HEDCs, and LEDCs.[4]

The estimation results for the travel import demand function and total import demand function are reported in Table 3. As a robustness check suggested in Pedroni (2001), we consider different maximum-lag specifications to ensure that results are not sensitive to the choice of lags in the testing model. We illustrate the results using the case of a maximum lag of two. For the full sample, both travel import demand and total import demand are income elastic, price elastic, and exchange-rate elastic, although travel import demand ($\widehat{\alpha} = 1.42$, $\widehat{\beta} = 1.35$, $\widehat{\gamma} = 1.01$) appears to respond to all three factors to a larger extent than total import demand ($\widehat{\alpha} = 0.97$, $\widehat{\beta} = 0.81$, $\widehat{\gamma} = 0.57$). For the subsamples, both import demand functions exhibit a pattern that HEDCs are more price elastic and less exchange rate elastic than LEDCs. Using the results for total import demand as an illustration, the $\widehat{\beta}$ ($\widehat{\gamma}$) for HEDCs and LEDCs is 1.24 (0.44) and 0.29 (0.73), respectively. This result suggests that the status of economic development has a similar impact on how travel import demand and total import demand each reacts to prices and exchange rate. In contrast, the two functions are not similar in regard to income elasticity; there is a positive (negative) relationship between income elasticity and the level of economic development for total import demand (travel import demand). Specifically, the income elasticity for total import demand is higher for HEDCs than LEDCs (1.27 versus 0.60), whereas for travel import demand income elasticity is lower for HEDCs than LEDCs (0.97 versus 1.97).

<Table 3 is about here>

2.4 Discussion

Our estimation results for income elasticity of total import demand are consistent with an international stylized trend - the income elasticity of import demand has a tendency to rise over time, noted in both the international economics and economic development literature. This trend was first mentioned by Houthakker and Magee (1969) in a study for the United States and later confirmed by Akhtar (1980) for a sample of industrialized countries. Melo and Vogt (1984), and Boylan and Cuddy (1987) also confirmed the trend in single-country studies for Venezuela and Ireland, respectively. More recently, Lo et al. (2007) offered a plausible explanation for the trend based on empirical evidence from a sample of 76 countries. The researchers argue that the process of economic development is normally associated with a rising share of manufacturing in GDP. In turn, this effect results in manufactured imports increasing as a percentage of total imports. Given that the income elasticity of import demand is higher for manufactured than non-manufactured imports, the changing composition of imports increases the overall elasticity of import demand. The policy implication from this line of research emphasizes that import (or trade) policies for developed countries need to have a stronger focus on changes in income than those for developing countries, as changes in income are shown to be an increasingly important determinant of import demand throughout the process of economic development.

Deviating from the universal trend of rising income elasticity of total import demand, we find that throughout the process of economic development, income elasticity for travel import demand decreases and changes in income become a less influential factor in the demand for international travel. This decreasing trend is supported by the estimation results showing that the income elasticity for travel import demand in LEDCs is twice as large as in HEDCs. In other words, people in LEDCs treat the consumption of international travel as a luxury ($\widehat{\alpha} = 1.97 > 1$), whereas those in HEDCs treat it more as a necessity ($\widehat{\alpha} = 0.97$, which is not significantly different than 1). The importance of this result for income elasticity in relation to economic development impacts the direction of public policy regarding the promotion of travel exports. This result supports a public policy initiative that seeks more "stable" international tourism income by focusing on attracting a larger proportion of tourists from more developed countries. For example, European countries like Switzerland and Belgium that attract a higher percentage of affluent travelers fared better during the economic downturn for the first three quarters of 2008 than the other popular European destinations (France, Italy, Spain, Germany, and the UK) based on the year-to-date growth in tourism receipts (7.45% versus 0.34%).

[4] The mean of real GDP per capita of US$ 20,000 is used as a cutoff point to ensure a similar number of countries in the subsamples.

3 Conclusions

In this paper, we have provided evidence that indicates in the long-run, as economies develop, the positive effect on the import demand for international travel from income growth diminishes. We show that this result is a complete deviation/contrast from the stylized international pattern of increasing positive response from income growth to total import demand. For effective public policymaking, we note that international tourism, which is a special form of international trade, should be addressed separately from the aggregate trade data.

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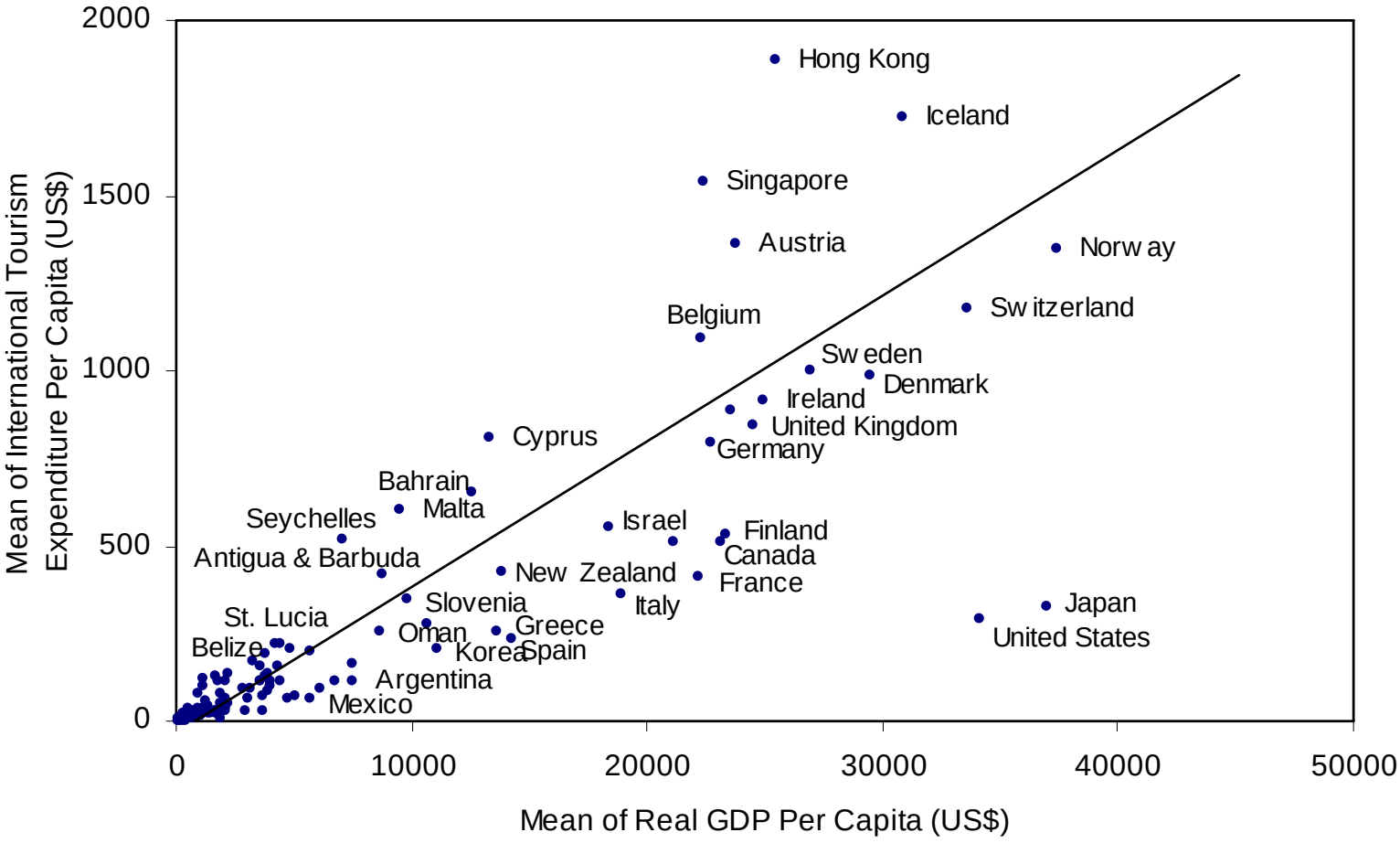

Figure 1. Real GDP and International Tourism Expenditure for All Sample Countries

Table 1
Regressions of real GDP per capita on international tourism expenditure per capita

	All sample countries	Higher economic development sample countries	Lower economic development sample countries
Regression	(1)	(2)	(3)
Constant	-34.564	-429.725	-9.407
	(-1.132)	(-1.272)	(-1.167)
Mean of real GDP per person	0.042***	0.056***	0.036***
	(16.269)	(4.170)	(14.465)
R^2	0.667	0.392	0.670
Number of observations	134	29	105
Robustness check:			
	Outliers excluded from (1)	Outliers excluded from (2)	Outliers excluded from (3)
Regression	(4)	(5)	(6)
Constant	-8.282	-210.876	-2.175
	(-0.847)	(-0.928)	(-0.441)
Mean of real GDP per person	0.034***	0.047***	0.032***
	(32.757)	(4.747)	(16.857)
R^2	0.897	0.484	0.749
Number of observations	125	26	97

T-statistics are in parentheses. *** denotes 1% significance level. We use Cook's distance test (Cook, 1977) to identify outliers and excluded them from associated regressions. For regression (1), Austria, Canada, France, Hong Kong, Israel, Japan, Luxembourg, Singapore, and the United States are outliers. For regression (2), Japan, Luxembourg, and the United States are outliers. For regression (3), Antigua and Barbuda, Argentina, Malta, Mexico, Seychelles, St. Kitts and Nevis, Trinidad and Tobago, and Uruguay are outliers.

Table 2
Panel regressions of the real GDP per capita growth on international tourism expenditure per capita growth

	All sample countries	Higher economic development sample countries	Lower economic development sample countries
Regression	(7)	(8)	(9)
Constant	0.078	-0.299**	0.155
	(0.880)	(-1.978)	(1.478)
$\Delta Y_{i,t-1}$	0.020**	0.016	0.027***
	(2.230)	(0.682)	(2.744)
$\Delta ITE_{i,t-1}$	-0.035	0.140**	-0.055
	(-1.150)	(2.213)	(-1.622)
R^2	0.097	0.268	0.081
Hausman test statistics	130.11***	13.68	117.24***
[p-value]	[0.000]	[0.188]	[0.000]
Regression model (Fixed or Random effect model)	Fixed-effect	Random-effect	Fixed-effect
Number of countries	134	29	105
Number of observations	1206	261	945

T-statistics are in parentheses. ** and *** denote 5% and 1% significance levels, respectively. Year dummies are included in each regression and results are available from the authors.

Table 3

Panel group FMOLS (between-dimension) results on international travel import demand function and (total) import demand function

Period: 1996-2006	Number of observations	Max. lag = 1			Max. lag = 2			Max. lag = 3		
a. International travel import demand function										
		$\hat{\alpha}$	$\hat{\beta}$	$\hat{\gamma}$	$\hat{\alpha}$	$\hat{\beta}$	$\hat{\gamma}$	$\hat{\alpha}$	$\hat{\beta}$	$\hat{\gamma}$
All sample countries	33	1.42**	1.37**	1.01**	1.42**	1.35**	1.01**	1.44**	1.44**	0.99**
		(25.81)	(9.44)	(23.19)	(30.13)	(10.63)	(29.14)	(36.42)	(13.54)	(33.90)
Higher economic development sample country group	18	0.96**	2.63**	0.72**	0.97**	2.61**	0.71**	1.02**	2.68**	0.71**
		(18.74)	(9.11)	(13.02)	(21.84)	(10.12)	(14.91)	(25.89)	(13.02)	(17.97)
Lower economic development sample country group	15	1.97**	-0.15**	1.36**	1.97**	-0.16**	1.36**	1.94**	-0.04**	1.32**
		(17.76)	(-4.03)	(20.14)	(0.76)	(4.69)	(26.89)	(25.66)	(5.83)	(30.59)
b. (Total) Import demand function										
		$\hat{\alpha}$	$\hat{\beta}$	$\hat{\gamma}$	$\hat{\alpha}$	$\hat{\beta}$	$\hat{\gamma}$	$\hat{\alpha}$	$\hat{\beta}$	$\hat{\gamma}$
All sample countries	33	0.98**	0.83**	0.58**	0.97**	0.81**	0.57**	0.97**	0.83**	0.56**
		(65.02)	(32.80)	(20.35)	(78.58)	(38.80)	(25.32)	(90.56)	(44.17)	(30.65)
Higher economic development sample country group	18	1.27**	1.32**	0.41**	1.27**	1.24**	0.44**	1.27**	1.30**	0.42**
		(45.08)	(17.81)	(4.65)	(55.99)	(21.30)	(6.65)	(64.30)	(24.90)	(7.82)
Lower economic development sample country group	15	0.64**	0.24**	0.78**	0.60**	0.29**	0.73**	0.60**	0.26**	0.73**
		(47.05)	(29.14)	(25.09)	(55.21)	(34.21)	(30.28)	(63.89)	(38.25)	(36.90)

T-statistics are in parentheses; *T*-statistics are for H_o: $\alpha = 0$; H_o: $\beta = 0$; H_o: $\gamma = 0$. ** denotes 1% significant level.