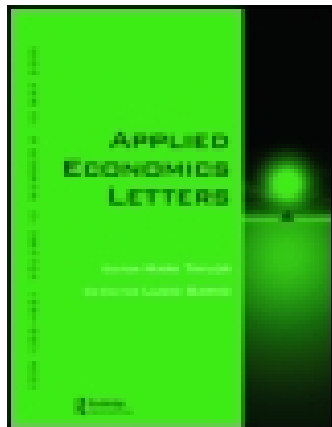


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Modelling the tourism receipt's volatility

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Modelling the tourism receipt's volatility

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Using data from 87 countries, we show that proximity of recipient countries to the economic centres of the world, a diversified source of international tourist supplies, and larger share of GDP as tourism revenues are conducive to lower volatility in tourism receipts. We also find that the volatility of tourism revenues is quite dispersed across countries and intensifies when tourism flow originates from a specific set of countries.

Keywords: diversification; international tourism receipts; volatility of tourism receipts

JEL Classification: F41; F40; F15

I. Introduction

With the aerial mapping of the skies that facilitates transportation, advances in technology and communication and the globalization of markets, tourism activities have developed steadily to become the most important sector of many developing markets while continue to play a key role in economic activities of developed markets. Tourism revenues have skyrocketed to levels beyond the \$1 trillion mark as per United Nations World Tourism Organization over the last two decades. This development has been possible due to a wide range of activities undertaken to diversify the industry, chief among these is the promotion of destinations via marketing and advertising campaign without discounting the power of word of mouth and social media.

Accordingly, a big strand of the literature has mostly focused on the economic impacts of tourism on local economies by estimating tourism demand models or documenting the existence of short- and long-run relationships between tourism activities and economic growth or lack thereof. Notable contributions include Tosun (2001), Gunduz and Hatemi (2005), Kim *et al.* (2006), Lee and Chang (2008) and He and Zheng (2011), among others whose findings have been mixed nonetheless; there is no consensus as to whether tourism indeed promotes economic growth.

The inability of the empirical literature to find a determining linkage between tourism and economic growth may stem from the volatile nature of tourism itself. In line with the loss aversion theory, since individuals strongly prefer avoiding losses to acquiring gains, good news for the tourism sector may have

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half the impact of bad news on output (see Kahneman and Tversky, 1984). Whilst this is quite an intriguing research question, our purpose in this article is to solely shed light on the volatile nature of tourism revenues. We conjecture this understanding is crucial if appropriate policy responses are to be framed, especially to minimize potential welfare costs associated and impact on output, international reserves and foreign exchange markets.

It is truism that natural disaster, political upheaval and health concerns that may arise disease outbreak have negative impacts on international tourism thereby leading to sudden stops and wild fluctuations in tourism revenues. Beyond these known phenomena and the cyclical effects of income growth across countries, we ask what other factors underlie such volatility. We hypothesize that the concentration of tourism inflows based on place of origin, the relative importance of the tourism sector for domestic output, distance from the economic centres of the world, being part of the same continent and the percentage of tourism revenues from high-income OECD countries to total tourism receipts of the country may be the determining factors underlying the volatility of tourism revenues.

II. Data and Descriptive Statistics

The data were collected from various sources. International tourism revenues for the period 1995–2010 originate from the World Development Indicators database for a sample of 87 developing and developed countries. GDP, consumer price index, population and exchange rate are from the International Monetary Fund's IFS Database. GDP variables were converted into US dollars to be consistent with the denomination of the tourism revenues data.

To capture the influence that the distribution of tourists based on country of origin might have on the volatility of tourism revenues, we obtain data from the United Nations World Tourism Organization and the Compendium of Tourism Statistics. These two databases provide a breakdown of tourism inflows to each country by nationalities. We use this information to create four important explanatory variables. The first is a measure of concentration of tourist inflows that

is based on the Herfindahl–Hirschman Index, namely,

$$\text{CON}_i = \sum_{j=1}^m s_j^2$$

where s_j is the share of tourists from country j visiting country i . This index takes values between 0 and 1 and indicates the relative importance of countries in sourcing tourists to the domestic economy. A value of 1 indicates that tourist diversification based on country of origin is limited to or dominated by only a single nationality or region, whereas a value of 0 indicates wide diversification. It is understood that the more diversified the tourism base of a country is (i.e., the lower CON_i) the lesser the volatility of tourism revenues.

Second, we use the continent (CONT_i) to determine whether sharing the same continent matters given that business cycles within continents are likely to be correlated, thereby hampering or benefiting tourism depending on how the tide goes. We define CONT_i as the share of tourists coming from countries in the same continent as country i . The OECD variable is the share of total tourists to country i originating from high-income OECD countries. Lastly, in line with existing literature, we hypothesize that distance matters towards understanding the volatility of tourism revenues given its explanatory power of business cycles asymmetry and transportation costs. Towards this end, using bilateral distance data from the French Research Center in International Economics, we compute the distance variable as the weighted average of the distances in thousands of kilometres from the capital city of a particular country to the capital cities of other countries using the total GDP shares of the other countries as weights. Algebraically;

$$\text{DIST}_i = \frac{1}{T} \sum_{t=1}^T \sum_j \frac{d_{ij} \text{gdp}_j^t}{\text{GDP}^t}$$

where d_{ij} is the distance from the capital city of country i to the capital city of country j , gdp_j^t is the output of country j at time t , GDP^t is the group-wide GDP, and T is the total sample length.

We summarize the descriptive statistics for the variables of interest and present the results in Table 1. The volatility of tourism revenues varies

Table 1. Descriptive statistics for the main variables

	Obs	Mean	SD	Max	Min
International tourism revenues (REV)	87	0.51	0.25	1.26	0.07
Tourist concentration (CON) index	87	0.39	0.19	0.86	0.15
Tourist receipts to GDP ratio (INT)	87	0.06	0.05	0.20	0.03
Distantness (DIST)	87	8.85	0.49	10.18	7.54
OECD share (OECD)	87	0.64	0.30	0.97	0.03
Continent share (CONT)	87	0.68	0.26	0.99	0.03

from a minimum of 0.07 for Malta to a maximum of 1.27 for the Kyrgyz Republic with an average of 0.51 and a SD of 0.25. The concentration ratio variable between 0 and 1 has a mean of 0.39 with a maximum 0.86 for Ukraine, and with a minimum 0.19 for Ghana. Figure 1 contains the distribution of the concentration ratio along with the volatility of the tourism receipts. The tourism receipts to GDP ratio is 8% on average over the overall sample, but hovers around 20% for small countries, such as Fiji, Samoa and Grenada according to Fig. 2. Statistics on the distance variable show that the East Asia and Pacific countries are further away from each other than countries in other continents. European and Central Asian countries are generally closer whereas Australia is the most distant with a value of 9.45, and Belgium the closest with a value of 7.54. (Fig. 3)

Table 1 also shows that on average 64% of tourism receipts in host countries originate from the OECD group. Eastern European countries receive the bulk of tourist inflows from developed economies, whereas South African countries

(Mauritius, Lesotho and Botswana) receive the lowest number of tourists from the OECD region. When it comes to sharing the same continent, on average we observe that 68% of tourists flow to recipient countries as a result, presented in Fig. 4. Eastern European countries (e.g., Latvia, Estonia and Croatia) attract the larger share of tourists from Europe, while Cape Verde, Egypt and Nepal experienced a negligible share of tourism receipts in this regard.

III. Empirical Analysis

We model the volatility of the international tourism revenues (REV_i) on a cross sectional basis from a sample of 87 countries as a function of the explanatory variables discussed above. The regression equation estimated takes the form of:

$$REV_i = \alpha_0 + \alpha_1 CON_i + \alpha_2 INT_i + \alpha_3 DIST_i + \alpha_4 CONT_i + \alpha_5 OECD_i + \varepsilon_i, \quad (1)$$

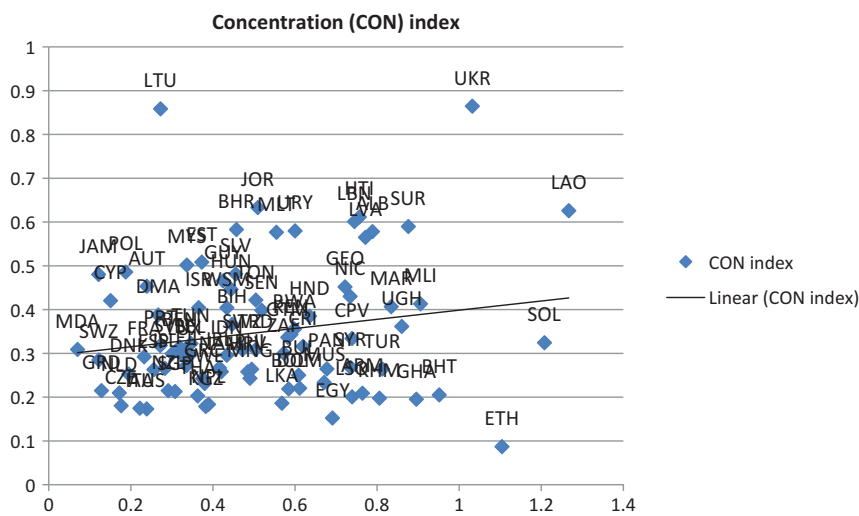


Fig. 1. The relationship between volatility of tourism revenues and concentration index

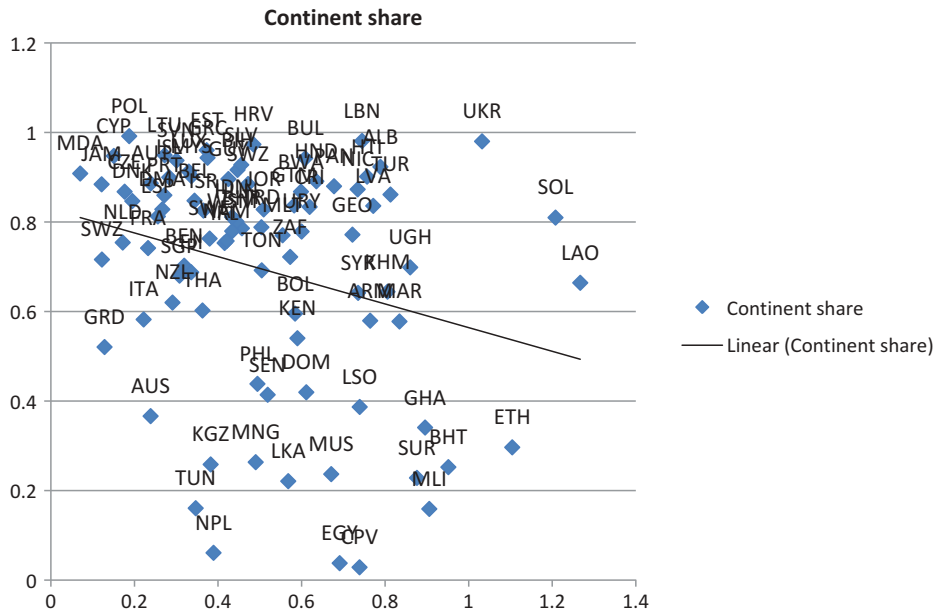


Fig. 2. The relationship between volatility of tourism revenues and continent share

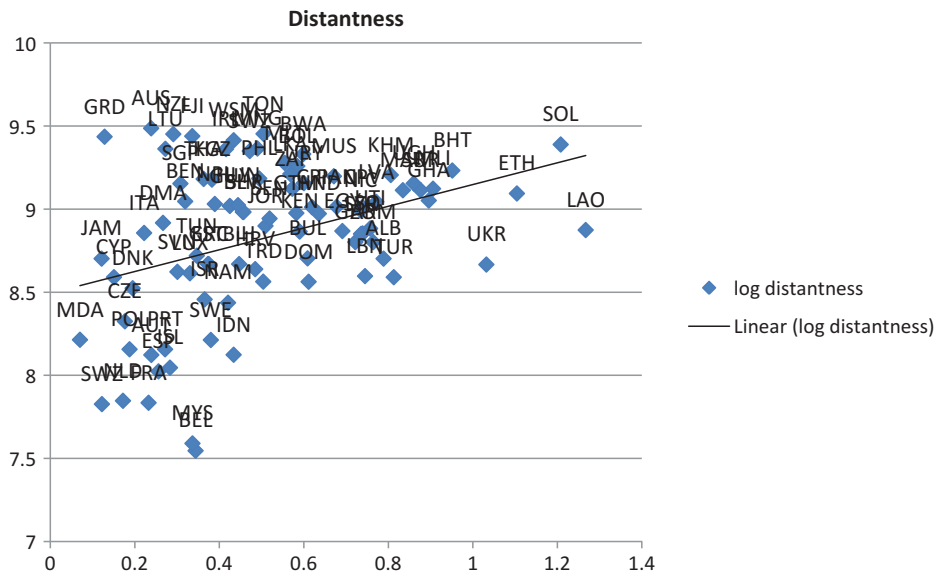


Fig. 3. The relationship between volatility of tourism revenues and distantness

The dependent variable (REV_i) is the SD of the international tourism revenues scaled by the average international tourism for country i between 1995 and 2010. INT_i is the ratio of international tourism receipts to GDP, which serves as a proxy for the

size of tourism receipts. We explained the rest of the variables in Section II.

Equation 1 is estimated via Ordinary Least Squares (OLS) method with first-order autoregressive disturbances and heteroscedasticity consistent SEs. Results

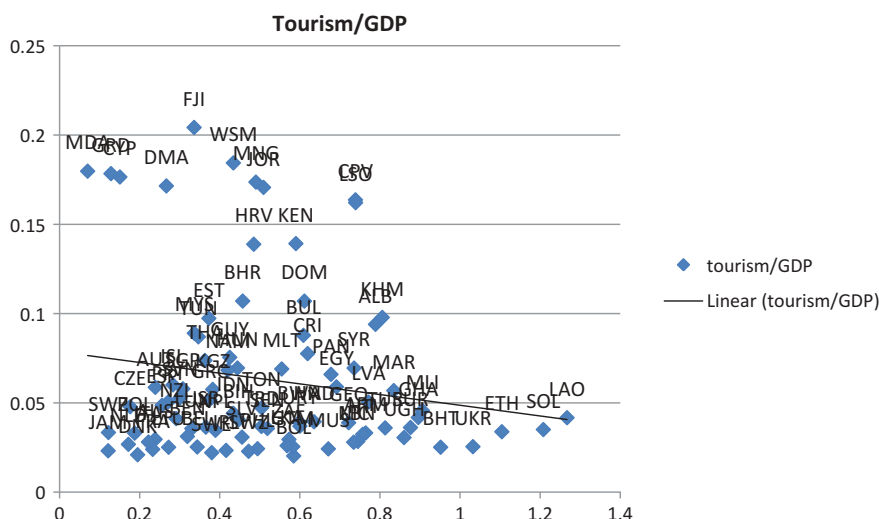


Fig. 4. The relationship between volatility of tourism revenues and tourism revenues to GDP ratio

are presented in Table 2 for both the individual and the multivariate specifications of Equation 1. In the first column, we observe that the coefficient estimate of concentration of the tourists flows from certain countries (CON_i) is positive and statistically significant in explaining the volatility of international tourism revenues, when taken alone.¹ This tends to suggest that the smaller the number of countries (i.e., the larger CON_i) from which a domestic touristic destination draws its tourist base from, the more fluctuation its tourism revenues are subjected to, which is quite counter-intuitive. As evidenced from Column 6 (the multivariate results), when all relevant variables are

included as per Equation 1 we find a positive and statistically significant impact of the concentration of tourists based on country of origin on the volatility of tourism revenues. Accordingly, when the bulk of tourism revenues come from a handful of countries, domestic touristic destinations are more (less) vulnerable to economic and political shocks affecting these countries, accordingly, the tourism revenues are expected more (less) volatile. In terms of the sign of the coefficient estimates, we find almost similar results for the OECD variable, which is not statistically significant as per the multivariate results, indicating that tourism revenues volatility is not tributary

Table 2. OLS estimations: exploring the determinants of the volatility in international tourism receipts

	(1)	(2)	(3)	(4)	(5)	(6)
CON index	0.70 (4.15)***					0.51 (2.79)***
Distance (DIST)		0.27 (2.12)**				0.17 (2.86)***
Continent share (CONT)			-0.27 (-2.34)**			-0.30 (-2.88)***
OECD share (OECD)				-0.15 (-1.74)*		0.05 (0.54)
Tourism receipts to GDP ratio (INT)					-0.87 (1.64)*	-1.09 (-2.11)**
R^2	0.14	0.18	0.11	0.10	0.03	0.38
Observations	87	87	87	87	87	87

Notes: All variables are averaged across time for each country. White heteroscedasticity-consistent *t*-statistics are given in parentheses.

***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

¹ Balli *et al.* (2011) have found that concentration index explains the volatility of the international financial asset receipts.

to countries drawing their tourist inflows largely from high-income OECD countries. From Columns 2 and 6, the distance variable ($DIST_i$) is positively and statistically significant in impacting the volatility of tourism revenues. Underlying the literature is the notion that distance as a fact of nature matters for business cycle asymmetry, thereby making it possible for consumption of goods and leisure activities to smooth over time. Since the distance variable measures how far a country is from the economic centres of the world that supplies the vast majority of international tourists, the estimates suggest that the farther away a country find itself from that hub, the larger the fluctuations in tourism receipts. These mainly stem from the frequent changes in the price of oil and exchange rates that increase transportation costs and fluctuate tourism demand.

Table 2 also shows that the coefficient estimates of both the continent share of tourists and the tourism receipts as a share of GDP reduce the volatility of tourism revenues, whether taken alone or in conjunction with other variables. These results suggest that countries that draw their tourists from other countries within the same continent and countries with tourism receipts accounting for a large chunk of their GDP endure less volatility in tourism revenues.

IV. Conclusion

The article suggests that diversification of tourists based on source countries, continent sharing and

larger share of GDP are key economic variables conducive to lower volatility of tourism revenues. This research is of importance to all stakeholders in the industry, mainly those who are in a position to make policy decision and to allocate resources towards promoting local touristic destinations.

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