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Are there Asymmetric Causal Relationships between Tourism and Economic Growth in a Panel of G-7 Countries?

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Abstract:

The aim of this paper is to analyse the relationship between tourism activity and economic performance for G-7 countries. This paper attempts to answer two questions. Firstly, it will look at whether economic growth causes increased tourism activity for Italy, Canada, Japan, France, the UK, the US and Germany. Secondly and most importantly, the paper will address the question of whether increased tourism activity causes economic growth for these countries. That is, the authors aim to examine whether the tourism led hypothesis is valid for any of these countries. This is done by applying the asymmetric panel causality test suggested by Hatemi-J (2011) to these countries for the period 1995-2012. This approach is an attempt to find out which tourism shocks, negative or positive, have a greater impact on economic performance and which of the GDP shocks have a greater impact on tourism activity for each country. The results show that there is a causal relationship between tourism activity and economic growth, with GDP actively causing tourism activity for Canada, Germany, France, Italy and Japan. In this case, Canada and Germany are the only two countries where a symmetric causal relationship is found. More importantly, the results further show that tourism activity causes GDP growth for Germany, France, Italy and US. Germany, France, and the US, however, are the only three countries where a symmetric causal relationship is found. Further, one could conclude that the TLGH is not valid for G-7 countries given that positive tourism activity shocks do not lead to positive economic output shocks for any of the countries.

Keywords: Economic growth, Tourism receipts, asymmetric panel causality test, G-7, VAR-SUR

JEL Classifications: L83, C33, F43, O50

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1. Introduction

Tourism is an important sector in the world economy. It is beginning to play an important role in the economic development of many countries, with globalisation increasing the number of tourist visits around the world. The millions of tourists traveling to many destinations have an impact on the income level of countries through a number of different channels. According to the UN World Tourism Organisation (2014), the number of international tourist arrivals has experienced consistent growth, from 528 million in 1995 to almost 1.1 billion in 2013. An increasing number of countries, both developing and developed, are paying more attention to the tourism, increasing their investment in the sector. This has resulted in tourism becoming one of the fastest-growing and most important sectors in the world. Not only has tourism contributed 9.5 per cent of total global GDP but it has also contributed 8.9 per cent of total global employment in 2013 (World Travel and Tourism Council, 2014: 1).

The tourism sector is said to play a particularly important role in the economic development of emerging and lower income countries. As a result, little research has been done to analyse the effect of tourism on the economic growth of developed countries. The effects of tourism on the economies of developed countries should be considered given the fact that 64 per cent of total tourism receipts in 2013 went to developed countries[1]. Therefore, the aim of this paper is to assess the causal impact of tourism activity on the economic performance of G-7 countries (Canada, France, Germany, Italy, Japan, the UK and the US), using an asymmetric panel causality test suggested by Hatemi-J (2011). These countries are of particular interest not only because they have well developed tourist infrastructure but also because 5 of these 7 countries are part of the top 10 tourism destinations by international tourism receipts in 2013. Such an analysis will give evidence of whether the tourism-led growth hypothesis (TLGH) is valid for the above-mentioned countries. This paper will not only assess whether tourism activity causes economic growth for the G-7 countries, but it will go further and test whether a contraction in tourism activity will negatively affect economic growth and vice versa[2]. To the best of our knowledge, this paper is the first attempt to investigate the asymmetric causal nexus of tourism and economic growth within a panel system.

The TLGH is taken from directly from the export-led growth hypothesis (ELGH) and states that higher economic growth is not only determined by increasing the amount of labour or capital in an economy but by also increasing tourism exports (Balaguer and Cantavella-Jordà, 2000: 2). According to de Mello-Sampayo and de Sousa-Vale (2012: 2) under the ELGH,

[1]The figure is calculated using data from the UNWTO. World tourism receipts in 2013 were US$1 159 billion and tourism receipts in the advances economies was US$745 billion in 2013.
[2] This paper will also look at whether economic growth shocks (negative and positive) affect tourism activity (positively and negatively).

tourism can contribute to growth in two ways. Firstly, the competition between local sectors and foreign sectors improves efficiency and secondly, tourism aids the exploitation of economies of scale. The latter helps decrease the total average costs of businesses because of the increased number of goods and services being produced (Brida and Pulina, 2010: 6).

However, tourism can affect economic activity through a number of other channels. First, for many developing countries, tourism can be a foreign exchange earner, which can be used, in theory, to import capital goods that are used to produce goods and services, thus leading to economic growth (Balaguer and Cantavella-Jordà, 2000: 2). Second, given that tourism is made up of a range of different sectors and is thus linked to a wide range of economic activities, increased demand in tourism should increase activity in these related industries, increasing household income and government revenues (through the multiplier effect). Since human capital is one of the main components of tourism, greater tourism activity has the ability to create new jobs, increasing employment which further increases household income. The increased income results in more consumption that produces further economic benefits and income for the economic agents in the local economy (Brida and Pulina, 2010: 5). Tourism can also stimulate investment in new infrastructure and competition, create economies of scale and allow for diffusion of technical knowledge (Brida et al. 2008:12).

There have been an increasing number of studies looking at the impact of tourism on economic activity, with a particular focus on developing countries and countries where tourism is an important part of the economy. Many of these studies make use of a vector error correction model (VECM) proposed by Johansen (1987) where a cointegrating relationship between tourism and economic growth can be tested. The TLGH was first tested by Balaguer and Cantavella-Jordà (2002), who aim to assess whether economic activity in Spain responds to increased international tourism activity during the 1975-1997 period. Using Johansen's cointegration methodology, the authors find that earnings from international tourism activity positively affect Spanish economic growth. Cortes-Jimenez and Pulina (2010), also check the validity of the TLGH for Spain and Italy, studying the Granger causality through a VECM. Not only is the TLGH confirmed in the long run for Spain, but the authors also find a bidirectional influence between tourism expansion and economic growth. This is understandable given that Spain is an important international tourist destination. With regards to Italy, The authors find a unidirectional Granger causality from tourism expansion to economic growth. Riss, Barquet, and Brida (2010) investigate the causal relations between tourism growth, relative prices and economic expansion for the Trentino-Alto Adige/Südtirol, Italy using Johansen's cointegration analysis and the Granger Causality test and they find that the TLGH is supported for this region.

Further, Gunduz and Hatemi-J (2005) examine the relationship between tourism and economic growth in Turkey by conducting a bootstrap causality test with leveraged adjustments and find that the TLGH is valid for the Turkish economy. Ongan and Demiroz (2005) also investigate the impact of international tourism receipts on the long-term economic growth of Turkey by using the Johansen technique and using a VECM. The authors find that there is bidirectional causality between international tourism and economic growth in this country. Katircioglu (2009), however, uses the bounds test and the Johansen technique for cointegration to test the validity of the TLGH in Turkey, and finds that both the bounds and Johansen test do not confirm long-term equilibrium relationship between international tourism and economic growth. The difference in results for these three studies could be attributed to the different time periods chosen and the choice of methodology by each paper.

Outside of Europe, a study by Tang and Jang (2009) examined the interrelationship between four tourism related industries and economic growth in the US. The authors did this by modelling a vector autoregressive model and applying the Granger causality and the cointegration tests. They find that while tourism industries in the US generally benefit from economic development in the short term, there is no long-run relationship between the economy and tourism industry development.

A number of studies that attempt to validate the TLGH have looked at a cross-section of countries. Figini and Vici (2010) provide an assessment of the relationship between economic growth, country size and tourism specialisation by using a cross-section of more than 150 countries from 1980 to 2005. The authors conduct an in-depth sensitivity analysis and find that for the period 1990-2005, there is no causal relationship between tourism specialisation and economic growth in these countries. In fact, it is found that the positive effect of tourism on economic growth is concentrated in the 1980s. de Mello-Sampayo and de Sousa-Vale (2012), on the other hand, analyse the long-run relationship between economic growth, international trade and tourism activity for a panel of 31 European countries by estimating the fully-modified OLS estimator and using a number of likelihood-based panel cointegration procedures. They find that there is evidence of a panel cointegration relationship between tourism and economic growth. Further, the authors find that tourism activity has a higher effect on economic growth in Northern Europe than in Southern Europe.

Furthermore, Lee and Chang (2008) use panel cointegration techniques to test the causality between tourism and economic growth for OECD and non OECD countries. They find that in both samples there is cointegration between tourism and economic growth. A unidirectional causality from tourism to economic growth is found in the OECD countries, while a bidirectional relationship is found in the non OECD sample. Eugenio et al. (2004) use the Arellano-Bond GMM dynamic panel estimator using data from 21 Latin America countries

for the 1985-1988 period and they show that tourism has a positive impact on economic growth, and also indicate that the relationship is more significant in low-medium income countries than high income countries. In the African context, Ige and Odularu (2007) use a pooled ordinary least squares model (POLS) to show the significance of tourism receipts to economic growth in West Africa. In other panel studies, Sequire and Nunes (2008) and Chang et al. (2012), both find a positive relationship between tourism and economic growth.

Despite many studies finding a positive relationship between tourism and economic growth, there are, however, studies that have failed to show such a link. Sequeira and Campos (2005) studied the relationship between tourism specialisation and economic growth for a large sample of countries from all over the world; they conclude that tourism alone cannot explain higher economic growth rates. In Korea, Oh (2005) finds that a cointegration relationship between tourism and economic growth does not exist, but a unidirectional causality running from economic growth to tourism does exist, thus TLGH cannot be validated. Lee (2008) also finds that there is no long- run relationship between tourism and economic growth in Singapore. Al-Najjar (2014) investigates the role of board structure in the tourism sector in Bahrain, Egypt, Jordan, Kuwait and Oman. His results support the tourism-led growth hypothesis in the mentioned countries at the firm-specific level.

While there may be a few exceptions, the literature presented above (and others not included in this review) confirms that a positive relationship between tourism and economic growth can be found[3]. This paper contributes to the literature by examining the relationship between tourism and growth in a more dissected way by using an asymmetric panel causality test. This approach is unique as it allows one to assess whether negative tourism shocks have a greater impact on economic growth than positive tourism shocks[4]. While the paper will examine whether tourism activity causes economic growth in general, the asymmetric analysis has greater implications for policymaking. Such information will allow policymakers to set policy and allocate resources in a more focused manner, concentrating on the tourism shock that most affects economic performance. Further, unlike some panel data-based papers, this paper does not look at the aggregate (pooled) effect of tourism activity on economic growth but analyses the relationship of these two variables for each country. This allows for the analysis of country-specific factors and prevents policymakers from implementing a 'one size fits all' policy that may have unintended consequences for those countries that may not exhibit the same relationship as the general case.

[3] For a more detailed literature review on the TLGH refer to the following paper: *Brida, J.G., and Pulina, M. 2010. "A literature review on the tourism-led-growth hypothesis". Fondazione Eni Enrico Mattei Working Papers Series 26.*

[4] This paper will assess if negative tourism shocks cause negative economic growth and if positive tourism shocks cause positive economic growth. Such an analysis includes looking at which shock has a greater impact.

The rest of the paper is organised as follows: Section 2 describes the methodology used. Section 3 presents the data and shows the empirical results and their interpretation. The last section provides a summary and concludes.

2. Methodology

There are a number of test methods that have been developed in the literature in order to test for Granger (1969) causality within a panel system. However, these tests do not allow for asymmetric causal effects. Since the pioneer work of Akerlof (1970), Spence (1973) and Stiglitz (1974) it is well-known that markets with asymmetric information exist. It is also well-known in the literature the economic actors tend to react more to negative changes compared to the positive ones in the absolute terms. Thus, it is important to allow for potential asymmetric effects when causality tests are implemented. Recently, Hatemi-J (2011) has suggested an asymmetric panel causality test, which is used in this study on the causal impact of tourism on the economic performance in the G-7 countries. Assuming that both Gross Domestic Product (GDP) and the variable that measures the impact of tourism are integrated variables each can be presented as the following:

$$y_{i1,t} = y_{i1,t-1} + e_{i1,t} = y_{i1,0} + \sum_{j=1}^{t} e_{i1,j}$$

$$y_{i2,t} = y_{i2,t-1} + e_{i2,t} = y_{i2,0} + \sum_{j=1}^{t} e_{i2,j}$$

For *i*=1, …,*7*. The denotation *e* is a white noise error term. The innovations can be defined as $e^{+}_{i1,t} := max(e_{i1,t}, 0)$, $e^{+}_{i2,t} := max(e_{i2,t}, 0)$, $e^{-}_{i1,t} := min(e_{i1,t}, 0)$ and $e^{-}_{i2,t} := min(e_{i2,t}, 0)$. By using definitions we can present the cumulative sums of the changes, i.e. $y^{+}_{i1,t}$, $y^{+}_{i2,t}$, $y^{-}_{i1,t}$ and $y^{-}_{i2,t}$, as the following:

$$y^{+}_{i1,t} = y^{+}_{i1,0} + e^{+}_{i1,t} = y_{i1,0} + \sum_{j=1}^{t} e^{+}_{i1,j}$$

$$y^{+}_{i2,t} = y^{+}_{i2,0} + e^{+}_{i2,t} = y_{i2,0} + \sum_{j=1}^{t} e^{+}_{i2,j}$$

$$y_{i1,t}^{-} = y_{i1,0}^{-} + e_{i1,t}^{-} = y_{i1,0} + \sum_{j=1}^{t} e_{i1,j}^{-}$$

$$y_{i2,t}^{-} = y_{i2,0}^{-} + e_{i2,t}^{-} = y_{i2,0} + \sum_{j=1}^{t} e_{i2,j}^{-}$$

Hatemi-J (2011) suggested estimating the vector autoregressive seemingly unrelated regression model of order *k*, VAR-SUR(*k*):

:

$$\begin{bmatrix} y_{i1,t}^{+} \\ y_{i2,t}^{+} \end{bmatrix} = \begin{bmatrix} \beta_{i0} \\ \gamma_{i0} \end{bmatrix} + \begin{bmatrix} \sum_{r=1}^{p} \beta_{i1,r} & \sum_{r=1}^{p} \beta_{i2,r} \\ \sum_{r=1}^{p} \gamma_{i1,r} & \sum_{r=1}^{p} \gamma_{i2,r} \end{bmatrix} \times \begin{bmatrix} y_{i1,t-r}^{+} \\ y_{i2,t-r}^{+} \end{bmatrix} + \begin{bmatrix} \varepsilon_{i1,t}^{+} \\ \varepsilon_{i2,t}^{+} \end{bmatrix} \quad (1)$$

The error terms in the system are defined by $\varepsilon_{i1,t}^{+}$ and $\varepsilon_{i2,t}^{+}$. Note that these error terms can be correlated across cross-section units. The lag order *p* is determined by minimizing a panel version of an information criterion suggested by Hatemi-J (2003, 2008), which is presented as the following:

$$HJC = \ln(|\Sigma|) + rm^2 n \left(\frac{lnT + \ln(lnT)}{2T}\right) \quad (2)$$

The denotation $|\Sigma|$ signifies the determinant of the variance-covariance matrix for the panel, *r=1, …, p*, where *p* is the optimal lag order, *m* is the number of variables in each cross section unit, *n* is the number of cross section units and *T* is the number of observations across time. It should be mentioned that *n* is 7 and *m* is 2 in this case.

The null hypothesis that $y_{i2,t}^{+}$ does not cause $y_{i1,t}^{+}$ for the cross sectional unit *i* in the panel is defined as

$H_0: \beta_{i2,r} = 0, \forall\, r$. Where $r = 1, \ldots, p$.

This null hypothesis can be tested by using a Wald test according to Hatemi-J (2011), Note that it is possible to conduct causality tests between negative components, i.e., $\left(x_{i1,t}^{-}, x_{i2,t}^{-}\right)$, in a similar way. The cumulative sums of the changes for each cross sectional unit are generated by using a statistical software component that is produced by Hatemi-J (2014).

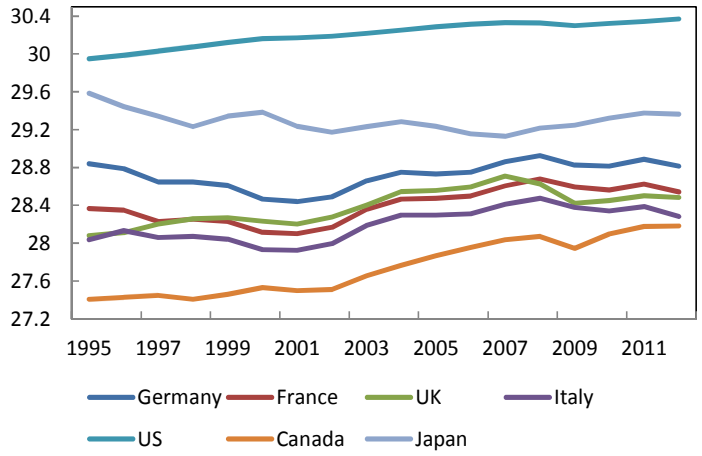
3. Data and empirical results

This section presents the results from the procedure described above to assess the relationship between tourism activity on the economic performance of G-7 countries (Canada, France, Germany, Italy, Japan, the UK and the US). The data used for this study is annual and covers the period from 1995 to 2012 for G-7 countries. The sample period has been decided purely by data availability on the measure for tourism activity. All variables are used in their natural log form. The data used are real GDP to measure economic performance and real international tourism receipts to measure the tourism performance for each country. Both the data are taken from the World Bank's World Development Index measured in current US dollars. The data are transformed from their nominal figures to their real figures using the US GDP deflator, with a base year of 2005.

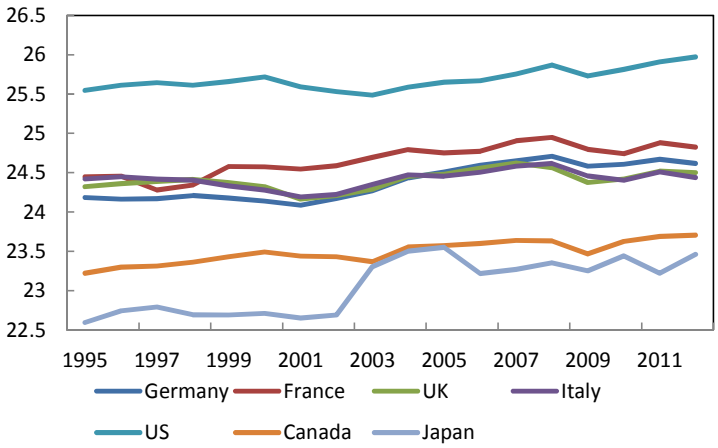
Figure 1 illustrates the trend of GDP and tourism receipts for G-7 countries for the period 1995 to 2012. As can be seen, both variables experienced an upward trend through the examined period for all countries in the sample (except for Germany, Italy and France). Germany, Italy and France experienced a downward trend during the period under review. There is a notable decline in GDP and tourism for Germany, France, the UK and Italy in 2001. Another notable decline in both GDP and tourism receipts for all the countries took place in 2009 following the global financial crisis of 2008/2009.

Figure 1: Annual Real GDP and Real Tourism Receipts of G-7 countries for 1995-2012

a. Logarithm of real GDP



b. Logarithm of real international tourist receipts



Given the trend that can be seen on figure 1, a unit root test was performed on the variables. The results presented in Table 1 show the IPS unit root test by Im, Pesaran, and Shin (2003). The results show non-stationarity in levels for both variables but stationarity in their first difference. Therefore the first differenced data are used for further statistical analysis. Tests for cross-sectional dependence and homogeneity were also conducted. To test for cross-sectional dependence, three tests were used, namely; Bresusch and Pagan (1980) test (CD_{BP}), the Lagrange Multiplier test (CD_{LM}) and the Pesaran (2004) test (CD) for cross-sectional dependence. Three tests for homogeneity were also used, the $\tilde{\Delta}$ and $\tilde{\Delta}_{adj}$ tests by Pesaran and Yamagata (2008) and a modified version of the Swamy (1970) test proposed by Pesaran and Yamagata (2008).

The results of the cross-sectional dependence and homogeneity are presented in Table 2 and as can be seen, the null hypotheses of no cross-sectional dependence and homogeneity are rejected at a 1 per cent significance level for all the tests. The presence of cross-sectional dependence means that a shock that occurred in a particular country is transmitted to other countries, given the high degree of globalisation, market integration, and close economic linkages between the G-7 countries. The rejection of slope homogeneity implies that assuming homogeneity in panel causality analysis will result in misleading inference and conclusions.

Table 1: IPS unit root test results for GDP and tourism receipts for G-7 countries

	GDP		**Tourism**	
	Constant	**Constant and trend**	**Constant**	**Constant and trend**
Level	-0.23055	-0.46191	0.31987	0.00636
First difference	-2.70432***	-3.31879***	-6.79618***	-5.64632***

Notes: Figures denote t-statistics. ***, ** and * indicate the rejection of the null hypothesis at the 1%, 5% and 10% levels respectively.

Table 2: Cross-sectional dependence and Homogeneity tests

Test	
CD_{BP}	91.083^{***}
CD_{LM}	10.814^{***}
CD	6.921^{***}
$\tilde{\Delta}$	5.500^{***}
$\tilde{\Delta}_{adj}$	5.993^{***}
Swamy Shat	202.202^{***}

Note: *** indicates significance at the 1% level. Swamy Shat is the modified version proposed by Pesaran and Yamagata (2008) for the Swamy's test

Finally, the results of the Panel causality tests are given on Table 3 below. This table reports the results of the causality test running form tourism to GDP and the causality test from GDP growth to tourism for all the countries in the sample. The non-asymmetric causality null hypothesis that tourism does not cause GDP growth can be rejected for Germany, France and the US. A 1% permanent shock in tourism will cause 0.9048% and 4.5216% increases in GDP for Germany and France respectively, and also a 0.0388% reduction in GDP for the US. From the asymmetric causality results, the null hypothesis of a positive shock in tourism not causing a positive shock in GDP growth cannot be rejected for all the G-7 countries. On the other hand, the null hypothesis that a negative shock in tourism does not cause a negative shock in GDP is rejected only for Italy at a 5% level of significance. The estimated causal parameter is 0.4101, which means that a 1% negative shock in tourism will cause a reduction in GDP of 0.4101%.

The null hypothesis of the non-asymmetric test that GDP growth does not cause tourism can only be rejected for Canada and Germany at a 5% level of significance. The casual parameters for Canada and Germany are estimated at 0.1750 and -0.2193. The asymmetric causality test indicates that the null hypothesis that a positive shock in GDP does not cause a positive increase in tourism can only be rejected for Canada and Italy, with the causal parameters being 0.3058 and 0.3365 for Canada and Italy respectively. However, the null hypothesis that a negative shock in GDP does not have a negative impact on tourism can only be rejected for Germany; the estimated causal parameter is 0.1322.

Table 3: The Results of Symmetric and Asymmetric Panel Causality Tests.

COUNTERY	NULL HYOTHESIS	P-Value of Causality Test	Significant Causal Parameter Value		NULL HYOTHESIS	P-Value of Causality Test	Significant Causal Parameter Value
Canada	$Tr \not\Rightarrow Y$	0.8383			$Y \not\Rightarrow Tr$	0.0427	0.175030
	$Tr^- \not\Rightarrow Y^-$	0.3295			$Y^- \not\Rightarrow Tr^-$	0.1137	
	$Tr^+ \not\Rightarrow Y^+$	0.4673			$Y^+ \not\Rightarrow Tr^+$	0.0342	0.305827
Germany	$Tr \not\Rightarrow Y$	0.0001	0.904800		$Y \not\Rightarrow Tr$	0.0261	-0.219296
	$Tr^- \not\Rightarrow Y^-$	0.0569	0.230932		$Y^- \not\Rightarrow Tr^-$	0.0367	0.132248
	$Tr^+ \not\Rightarrow Y^+$	0.1587			$Y^+ \not\Rightarrow Tr^+$	0.5059	
France	$Tr \not\Rightarrow Y$	0.0484	4.521626		$Y \not\Rightarrow Tr$	0.5372	
	$Tr^- \not\Rightarrow Y^-$	0.1109			$Y^- \not\Rightarrow Tr^-$	0.6462	
	$Tr^+ \not\Rightarrow Y^+$	0.3944			$Y^+ \not\Rightarrow Tr^+$	0.0532	0.387828
Italy	$Tr \not\Rightarrow Y$	0.0721			$Y \not\Rightarrow Tr$	0.9468	
	$Tr^- \not\Rightarrow Y^-$	0.0028	0.410194		$Y^- \not\Rightarrow Tr^-$	0.1597	
	$Tr^+ \not\Rightarrow Y^+$	0.1131			$Y^+ \not\Rightarrow Tr^+$	0.0267	0.336481
Japan	$Tr \not\Rightarrow Y$	0.7951			$Y \not\Rightarrow Tr$	0.2617	
	$Tr^- \not\Rightarrow Y^-$	0.8340			$Y^- \not\Rightarrow Tr^-$	0.2102	
	$Tr^+ \not\Rightarrow Y^+$	0.2474			$Y^+ \not\Rightarrow Tr^+$	0.0848	0.877600

UK	$Tr \neq> Y$	0.5227			$Y \neq> Tr$	0.5726	
	$Tr^- \neq> Y^-$	0.2186			$Y^- \neq> Tr^-$	0.8208	
	$Tr^+ \neq> Y^+$	0.4715			$Y^+ \neq> Tr^+$	0.6658	
US	$Tr \neq> Y$	0.0001	-0.038808		$Y \neq> Tr$	0.5862	
	$Tr^- \neq> Y^-$	0.1332			$Y^- \neq> Tr^-$	0.4578	
	$Tr^+ \neq> Y^+$	0.2118			$Y^+ \neq> Tr^+$	0.3057	

1. The denotation Tr ≠> Y means that tourism does not Granger cause GDP in the panel.
2. The denotation $Y \neq> Tr$ means that GDP does not Granger tourism cause in the panel.
3. The optimal lag order in the model is set one based on minimizing the information criterion presented in equation (2).

4. Conclusion

Past literature has shown, with a few exceptions, that a positive relationship between tourism and economic growth exists particularly with developing countries and countries where tourism plays an important role in the economy. This paper contributes to the literature by assessing the causal relationship between tourism activity and economic growth. This is done using annual data for the period between 1995 and 2012 for the G-7 countries. In order to empirically asses the causal effects between these two variables, this paper used the asymmetric panel causality test of Hatemi-J (2011). It is important to account for asymmetric effects given that literature has shown that economic actors tend to react more to negative changes compared to the positive ones in absolute terms. The results show that there is a causal relationship between tourism activity and economic growth, with tourism activity causing GDP growth for Germany, France, Italy and US. Germany, France, and the US, however, are the only three countries where a symmetric causal relationship is found. For Italy and Germany, it is found that negative tourism activity shocks cause negative economic output shocks. Positive tourism activity shocks do not lead to positive economic output shocks for any of the countries. Therefore, whether or not asymmetric effects are taken into account, one could conclude that the TLGH is not valid for G-7 countries. Such a conclusion is not unexpected given that these countries have very diversified economies and the fact that tourism makes up a small part of their economies.

The results further show that there is a causal relationship between economic growth and tourism, with GDP growth causing tourism activity for Canada, Germany, France, Italy and Japan. In this case, Canada and Germany are the only two countries where a symmetric causal relationship is found. Germany is the only country where negative economic output shocks cause negative tourism activity shocks. Positive economic shocks cause positive tourism shocks for Canada, France, Italy and Japan. A bidirectional relationship is found only for Germany. All the tests are performed at a conventional 5 per cent level of significance. These results show that while economic growth is great for growth in the tourism sector in four of the 7 countries observed, none of the G-7 countries should have policy that is aimed at improving economic growth through tourism.

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