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TESTING FOR THE TOURISM LED ECONOMIC GROWTH HYPOTHESIS IN SWEDEN WITH STRUCTURAL BREAKS*

ABSTRACT

Many emerging as well as frontier markets have promoted tourism for achieving economic growth. This paper investigates empirically the impact of tourism receipts on the economic performance in Sweden. The results of tests for cointegration reveal that there is a long run relationship between the underlying variables if the effect of two unknown structural breaks are accounted for. The elasticity of the GDP with regard to revenue from tourism is around 0.99, which decreases during 1973-1977 but increases during 1978-2017. The result from the bootstrap causality test also shows that the tourism-led growth hypothesis is empirically supported in the case of Sweden.

Keywords: Tourism Receipts; Economic Growth; Sweden; Structural Breaks; Bootstrap Causality Test

JEL Classification: C32; E01; F43

RIASSUNTO

Test sull'ipotesi della crescita economica trainata dal turismo con break strutturali in Svezia

Molti mercati emergenti, così come molti mercati di frontiera, hanno promosso il turismo al fine di raggiungere lo sviluppo economico. Questo articolo analizza empiricamente l'impatto degli incassi turistici sull'economia della Svezia. I risultati dei test di cointegrazione rivelano che c'è una relazione di lungo periodo tra le variabili evidenziate se si tiene conto dell'effetto di due *break* strutturali. L'elasticità del PIL in riferimento al reddito derivante dal turismo è circa 0.99, scende nel periodo 1973-1977 ma cresce nel periodo 1978-2017. Il risultato del test di causalità *bootstrap* dimostra anche che l'ipotesi di una crescita trainata dal turismo è empiricamente supportata nel caso della Svezia.

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I. INTRODUCTION

The tourism sector is a large and growing sector in the global economy. The demand for tourism services is growing as a consequence of growing world income together with an increased economic integration and general deregulations such as visa free travelling combined with relatively cheaper travelling costs. The increased economic wellbeing generates an increased possibility for a larger amount of the world population to consume leisure activities including leisure travel. This also generates an increased possibility to shift from what is often regarded as local domestic inferior leisure travel to internationally luxury leisure travel. As more countries reach the stage of development where consumption of leisure activities become affordable, then it can be expected that demand for tourism services will continue to grow in the future. The increased demand for leisure travel and goods and services generated in the destination-country economically benefits the country in general and their local tourism-regions in particular generating job-opportunities and influx of much-needed foreign currency. In fact, policy makers in both frontier and emerging markets have systematically been trying to promote inbound tourism.

Tourism is for many economies a significant sector and it is for many small economies the most important sector of the economy. This significant importance of tourism might necessarily not only be beneficial to a country as tourism is highly volatile where preferences or international economic income can change swiftly in the short-run making a tourism-dependent economy vulnerable in a similar case as an oil- and gas-dependent economy related to e.g. the Dutch disease problem. The global economic crises as well as local military conflicts illustrates the potential economic consequences of a negative shock to a country over-dependent on tourism.

Besides generating job-opportunities and influx of foreign currency, there are different channels through which tourism can generate a positive effect on economic growth. The different channels are e.g. increased personal income, taxes, revenues and employment opportunities as discussed in Lee and Chang (2008), increased earnings of foreign exchange yielding accumulation of capital goods contributing to the balance of payments as discussed in McKinnon (1964) and the stimulation of investments in new infrastructure, human capital and technology as discussed in Eugenio-Martín *et al.* (2004), Sakai (2009), Blake *et al.* (2006), Feng and Morrison (2007) and Lemmetyinen and Go (2009). Besides the direct effects in the tourism sector itself, tourism stimulates indirectly and by induced effects other related industries

causing positive economics to scale and scope as discussed in Syriopoulos (1995), Andriotis (2002), Weng and Wang (2004) and Spurr (2009).

The positive contribution to growth by tourism-related consumption in the destination-country needs not necessarily only to be permanent in nature but can be temporary. As discussed in e.g. Cerina (2007), Giannoni and Maupertuis (2007) and Lozano *et al.* (2008), this argument is related to proposition that increase over time of the exploitation of the tourism-dependent natural resources become greater than their natural rate of reproduction which in turn might cease to affect the long-run growth. Furthermore, disadvantages from tourism dependence can also be related to costs incurred from the provision and maintenance of tourism-related infrastructure and resources devoted to specialized education as discussed in Sinclair (1998), increased pollution, congestion or despoliation of the environment as discussed in Pearce (1985), Jenner and Smith (1992) and Gursoy and Rutherford (2004) and potential increases of crime and violence as discussed in Dunn and Dunn (2002). However, by aggregating the potential economic, social, cultural, environmental and political benefits and costs to a country specializing in tourism development, the general consensus is that the tourism sector may significantly contribute to economic growth as discussed in Brida and Pulina (2010), Brida *et al.* (2016a) and Gwenthure and Odhiambo (2017) and especially of an importance to developing countries endowed with tourism-related natural resources as discussed in Candela and Cellini (1997) and Lanza and Pigliaru (2000).

Lanza and Pigliaru (1995) made one of the first theoretical contributions investigating the link between economic growth and a specialization in tourism. Their main findings are that countries with a relative large tourism sector also generally being small economies exhibit higher than average rates of growth. Hence, a country with a relative abundance of natural resources demanded in tourism services specializing in the tourism sector will enter a faster growth path where developing countries often are more endowed with tourism-dependent natural resources as argued in Sinclair (1998). A country with a large endowment of natural resources suitable for tourism-services specializing in tourism will generate a significant positive contribution to economic growth as discussed by Lanza and Pigliaru (2000). Candela and Cellini (1997) show that the smaller the economy the easier to benefit from a specialization in tourism in terms of an increase in economic growth.

The tourism-industry is generally characterized by a low entry-threshold as well as a low exit-threshold making a tourism-dependent economy vulnerable to competitors and potential competitors. This is the case due to the notion that the industry is generally characterized by low levels of technology and low labor skills. This in turn implies that low-skilled labor-abundant countries with tourism-required natural resources relatively easy can develop a competitive tourism-sector exploiting its comparative advantage. For a more developed capital-abundant country with a higher marginal revenue product to stay competitive in the tourism-sector, there is a need to develop its tourism-service into a segment with less demand for low-skilled labor focused on tourists with a higher willingness to pay. This segment is related to a supply of a combined service with a high marginal utility for the consumer. This service can e.g. be related to a luxury service above the level of its low-skilled labor competitors or a scarce unique natural resource much demanded but open to a few and absent in many competing nations such as tranquility in the wild-life with a high marginal utility to people living in over-populated countries and urban areas.

The competitive edge need to be generated from the service supplied to the market where the service in itself generally is made up of accommodation, food, transportation, entertainment and life-experiences. For developing low-skilled labor countries, the competitive edge are generally linked to low prices with a basic overall level of quality in the service while developed high-skilled labor countries need to develop their service into segments demanding a high-quality service meeting their expectations related to a high willingness to pay. The possibility to develop the tourism-service supplied to the market is central for a country developing from a low-skilled low-wage country to a high-skilled high-wage country to stay competitive not losing its competitive edge in this industry characterized by a low entry-threshold, low levels of technology and low-skilled labor. If this development does not occur, it seems reasonable to expect that diminishing returns will eventually set in putting a limit to the extent that the tourism sector can contribute to a country's wellbeing.

This argument relies on the assumption that a progress and development is generated from an increasing tourism-sector in turn generating an increased labor-demand with increasing wages and economic wellbeing in the country. The increase in wages will spillover into higher prices in the labor-intensive tourism-sector and a need to make production less labor-intense and/or develop the service into a segment with higher marginal utility and willingness to pay for the

service. The question is if this is a possibility for a developed high-skilled high-wage country to develop its service to stay competitive. This is not analyzed to the same extent in the literature as is the case for developing countries.

This paper will make a contribution to fill that gap in the literature by analyzing whether or not there is a link between tourism-services and economic growth in Sweden. To the best knowledge, this issue has not been investigated for Sweden. We investigate the long run relationship between tourism receipts and economic performance in Sweden by conducting tests for cointegration with unknown structural breaks. We also test the tourism led growth hypothesis via the bootstrap causality test, which is robust to non-normality and time varying volatility of the underlying data.

The rest of the paper is organized as follows. Section 2 contains a brief literature review, section 3 discuss the methodology and section 4 discuss the empirical findings. Section 5 concludes the paper with final remarks.

2. BRIEF LITERATURE REVIEW

The first attempt to investigate empirically the impact of tourism on economic growth was made by Ghali (1976), to the best knowledge. The paper by Balaguer and Cantavella-Jordá (2002) referred formally to the tourism-led growth hypothesis offering a theoretical and empirical link between inbound tourism and economic growth. The tourism-led growth hypothesis was in the paper by Balaguer and Cantavella-Jordá (2002) derived from the export-led growth hypothesis linking growth to expanding exports in turn developed by McKinnon (1964), Balassa (1978), Krueger (1980) and Helpman and Krugman (1985). Balaguer and Cantavella-Jordá (2002) find that Spanish economic growth is sensible to persistent expansion of international tourism.

Since the paper by Balaguer and Cantavella-Jordá (2002), several studies has appeared trying to understand the temporal relationship between tourism and economic growth whether developments in the tourism sector contributes to economic growth or not as indicated by the tourism-led growth hypothesis. The empirical evidence on the impact of the tourism sector on economic growth is to some degree mixed. Lee and Chang (2008) point out that the inconclusiveness is related to a lack of homogeneity and comparability in terms of sample data, time periods, geographical locations and use of methodologies. However and as pointed out in

Brida *et al.* (2016a), the empirical findings with a few exceptions suggest that overall international tourism drives economic growth.

Brau *et al.* (2007) investigate 143 countries where their results indicate that tourism countries grow significantly faster than all other sub-groups considered in their analysis. Di Liberto (2013) analyze a panel of 72 countries during 1980-2005 finding a positive and significant impact on growth from the tourism sector. Furthermore, they also show that increased education contributes to growth and that the role of the tourism sector is significantly larger in countries with higher aggregate levels of human capital. Overall, the results suggest that an increase in human capital endowments is always beneficial to growth even when the development strategy focuses on expansion of an unskilled sector. Ekanayake and Long (2012) using a panel of developing countries find evidence that tourism revenues makes a positive contribution to economic growth.

Dritsakis (2004) investigates the impact of tourism on long-run economic growth in Greece under a multivariate framework finding evidence supporting the tourism-led growth hypothesis. Gunduz and Hatemi-J (2005) using a leveraged bootstrap causality test found evidence that the tourism-led growth hypothesis is supported empirically in the case of Turkey. The same result was found in the paper by Ertugrul and Mangir (2015) validating the tourism-led growth hypothesis for Turkey. In the paper by Cortés-Jiménez (2008) focusing on both regional as well as international tourism in Spain and Italy, evidence indicates that domestic tourism is a relevant factor for Spanish growth whereas international tourism is more important for Italian economic growth.

Carrera *et al.* (2008) find evidence of the validity of the tourism-led growth hypothesis in Mexico using a linear cointegration analysis. Eugenio-Martín *et al.* (2004) focus on Latin American countries where the empirical evidence indicates that tourism growth is associated with higher economic growth in low and medium income countries but not in high income countries. Phiri (2015) finds evidence supporting the tourism-led growth hypothesis for South Africa under the linear cointegration analysis.

Lee and Hung (2010) find that tourism imposes a positive impact on Singapore's economic development in the long-run. Tang (2011) finds that international tourism arrivals and economic growth exhibit a long-run relationship for Malaysia in all 12 different disaggregated tourism

markets of the country. Untong (2014) examine the validity of the tourism-led growth hypothesis for Thailand and finds that it is valid during 1980-2012 but not valid during 1960-1979. Hence, the level of tourism specialization seems to play an important part in the tourism-growth nexus in Thailand. Similarly, Ahad (2016) find evidence of the tourism-led growth hypothesis in Pakistan. Schubert *et al.* (2011) conclude that small islands highly specialized in tourism activity rank as top 10 nations according to the contribution of tourism activity to gross domestic product.

Figini and Vici (2010) find some evidence linking tourism specialization with economic growth for the 1980-1990 period but not for the 1990-2005 period with the general conclusion that tourism-based countries have not grown at a higher rate than non-tourism-based countries. However, they conclude that the data for the period are not fully reliable such that there is no robust evidence on the link between tourism specialization and higher growth rates. Hence and unlike most of the previous empirical literature, they conclude that there is no significant independent relationship between tourism specialization and economic growth. Sequeira and Campos (2007) find no evidence linking tourism specialization with higher growth rates while Sequeira and Nunes (2008) find empirical evidence linking tourism specialization with higher growth rates both in a broad sample of countries and in a sample of poor countries. Hatemi-J (2016) provides empirical evidence in support of the export led growth hypothesis for the UAE, a country that relies heavily on tourism in order to diversify its economy. Furthermore, Oh (2005) finds that the tourism-led growth hypothesis does not hold for South Korea and Brida *et al.* (2016b) find that the tourism-led growth hypothesis holds only in the case of Brazil under a nonlinear cointegration model analysis but does not hold for Argentina¹.

3. METHODOLOGY

The data is collected from the Swedish Agency for Economic and Regional Growth (tillvaxtverket.se) and Statistics Sweden (scb.se) with a yearly frequency covering the period 1950-2019. This data set contains tourism receipts (T), private consumption (C), public consumption (G), gross investment in real capital (I), the exports of goods and services (X), the

¹ For a recent study on the relationship between sustainable development and tourism see Isik (2018). Recent literature review articles are published by Nunkoo *et al.* (2020), Fonseca and Sánchez-Rivero (2019), Comerio and Strozzi (2019), among others. For a review of the hundred most influential articles on the tourism-led growth hypothesis see Ahmad *et al.* (2020).

imports of goods and services (M) and the gross domestic product (GDP). All variables are converted into real values using the consumer price index (CPI). Tourism receipts is defined in line with the definition of the UNWTO (United Nations World Tourism Organization) incorporating peoples' activities traveling to other places than they visit on a regular basis at a shorter duration of one year for leisure, business or other purposes.

In order to find out whether or not there is a long run relationship between economic growth and tourism receipts in Sweden we conduct tests for cointegration in the presence of two unknown structural breaks. Accounting for potential breaks can increase the power of the underlying tests. For these purpose, three tests that are developed by Hatemi-J (2008) are used. These tests are described as the following. Let Y_t be the log of GDP and X_t be the log of tourism receipts. The following regression can be used in order to investigate the long run relationship between the two underlying variables:

$$Y_t = a_0 + a_1 D_{1t} + a_2 D_{2t} + b_0 X_t + b_1 D_{1t} X_t + b_2 D_{2t} X_t + e_t \quad (1)$$

Where a_0 is the intercept and a_1 and a_2 are changes in the intercept. The slope is defined by b_0 and b_1 and b_2 are changes in the slope. Since the variables are expressed in logarithmic form, the slope represents the elasticity. The last term in equation (1) represents the error term. D_{1t} and D_{2t} are the two unknown indicator variables that allow for potential breaks, which are defined as the following:

$$D_{1t} = \begin{cases} 0 & \text{if } t \leq [n\tau_1] \\ 1 & \text{if } t > [n\tau_1] \end{cases}$$

and

$$D_{2t} = \begin{cases} 0 & \text{if } t \geq [n\tau_2] \\ 1 & \text{if } t > [n\tau_2] \end{cases}$$

The relative timing of each underlying break is $\tau_1 \in (0.15, 0.70)$ and $\tau_2 \in (\tau_1 + 0.15, 0.85)$. Note that $n = \frac{t}{T}$, where $t = 1, \dots, T$. To test for cointegration, three test statistics are used. The first one is the Augmented Dickey-Fuller (ADF) test, which is calculated by the corresponding t-test value for the slope of e_{t-1} in a regression of Δe_{t-1} on $e_{t-1}, \Delta e_{t-1}, \dots, \Delta e_{t-k}$. The optimal lag order k is determined by minimizing an information criterion. On the other hand, the Z_α and Z_t test

statistics are calculated by using the bias-corrected first-order serial correlation coefficient estimate, ρ^* , which is defined as the following²:

$$\rho^* = \frac{\sum_{t=1}^{n-1} (\hat{e}_t \hat{e}_{t-1} - \sum_{j=1}^B w(j/B) \hat{\gamma}(j))}{\sum_{t=1}^{n-1} (\hat{e}_t^2)}$$

Note that the function $w(\cdot)$ provides kernel weights that fulfill standard conditions for spectral density estimators. B is the bandwidth number and $\hat{\gamma}(j)$ the estimated covariance function, which is defined as the following:

$$\hat{\gamma}(j) = \frac{1}{n} \sum_{t=j+1}^T (\hat{e}_{t-j} - \hat{\rho} \hat{e}_{t-j-1})(\hat{e}_t - \hat{\rho} \hat{e}_{t-1})$$

Note that $\hat{\rho}$ is the OLS estimator of the effect of \hat{e}_{t-1} on \hat{e}_t . The Z_α and Z_t test statistics for testing the null hypothesis of no cointegration in the presence of two unknown structural breaks are the following:

$$Z_\alpha = n(\hat{\rho}^* - 1)$$

and

$$Z_t = \frac{\hat{\rho}^* - 1}{\hat{\gamma}(0) + 2 \sum_{j=1}^B w(j/B) \hat{\gamma}(j) / \sum_{t=1}^{n-1} (\hat{e}_t^2)}$$

It should be mentioned the $\hat{\gamma}(0) + 2 \sum_{j=1}^B w(j/B) \hat{\gamma}(j) / \sum_{t=1}^{n-1} (\hat{e}_t^2)$ represents the estimated value of the long-run variance of the residuals in regression that has \hat{e}_t as the dependent variable and \hat{e}_{t-1} is the independent one. The distribution of these three tests are nonstandard and they have been produced by Hatemi-J (2008) via the simulation methods. The test values that are used are the lowest values of these tests through all values for τ_1 and τ_2 , with $\tau_1 \in T_1 = (0.15, 0.70)$ and $\tau_2 \in T_2 = (0.15 + \tau_1, 0.85)$. The reason for choosing the lowest value for each test statistic is that the

² Note that the Z_α and Z_t test statistics were introduced by Phillips (1987). Gregory and Hansen (1996) showed how these two tests can be used when there is one unknown structural break. Hatemi-J (2008) extended these test for testing for cointegration when there are two unknown structural breaks. The distribution of the underlying test is not similar and has been generated via the simulation methods.

lowest value characterizes the empirical evidence against the null hypothesis of no cointegration. Thus, we used the following values:

$$ADF^* = \inf_{(\tau_1, \tau_2) \in T} ADF(\tau_1, \tau_2) \quad (2)$$

$$Z_t^* = \inf_{(\tau_1, \tau_2) \in T} Z_t(\tau_1, \tau_2) \quad (3)$$

$$Z_\alpha^* = \inf_{(\tau_1, \tau_2) \in T} Z_\alpha(\tau_1, \tau_2) \quad (4)$$

These tests are implemented by using an algorithm produced in Gauss by Hatemi-J (2009). In order to test for the tourism-led growth hypothesis in the causal terms, we also implement the bootstrap causality test method as developed by Hacker and Hatemi-J (2006, 2012). This test method results in accurate inference unlike the standard ones when the desirable statistical assumptions for a good model such as normal distribution and homoscedasticity are not fulfilled.

4. EMPIRICAL FINDINGS

The results of the cointegration tests with two unknown breaks are presented in Table 1. Based on these results, it can be seen that the Z_t^* test statistic suggests that there is cointegration at the 5% significance level, while the other two test statistics suggest that there is cointegration at the 10% level. The most significant breaks are found to be as the following. The first break is in year 1974 and the second break is in year 1978. It should also be mentioned that tests for unit roots, not presented here, showed that the variables have a unit root with drift and intercept.

TABLE 1 - *The Results of the Tests for Cointegration with Two Unknown Structural Breaks*

Test Statistic	Estimated test value	1% Critical Value	5% Critical Value	10% Critical Value
ADF*	-5.702	-6.503	-6.015	-5.653
Z_t^*	-6.861	-6.503	-6.015	-5.653
Z_α^*	-55.005	-90.794	-76.003	-52.232

Notes: the tests are implemented via a statistical software component produced in Gauss by Hatemi-J (2009).

The estimated cointegrating vector is presented in Table 2. Based on these estimates we can note the following. The elasticity of the GDP with regard to the tourism revenue is 0.99 in Sweden. This elasticity has decreased by the amount of 0.495 during the first break and it has increased by the amount of 0.186 in the second break period.

TABLE 2 - *The Estimated Values of the Parameters*

	α_0	α_1	α_2	β_0	β_1	β_2
Estimated parameter values	5.385	3.526	1.455	0.990	-0.495	0.186
<i>t</i> -values	28.968	3.928	-1.631	32.817	-4.308	1.657

In addition, the causality test was performed using the leveraged bootstrap simulation method. The result of this test is presented in Table 3. Based on this empirical finding, one can infer that the null hypothesis of the tourism revenue not causing the GDP can be rejected at the five percent significance level since the test value is higher than the critical value at that given significance level.

TABLE 3 - *The Result of Bootstrap Causality Test*

H_0	Estimated test value	1% Bootstrap Critical Value	5% Bootstrap Critical Value	10% Bootstrap Critical Value
Tourism does not cause GDP	9.824	12.916	8.866	6.868

Notes: The bootstrap causality test with leverage adjustments was implemented by using a statistical software component written in Gauss by Hacker and Hatemi-J (2010). The optimal lag order was determined by minimizing an information criterion suggested by Hatemi-J (2003).

5. CONCLUSIONS

Many countries have attempted systematically to promote inbound tourism in order to achieve the positive impact of this variable in terms of higher economic growth rates. In the existing literature, the relationship between tourism and economic performance has been investigated for many countries both for the developing as well as the developed ones. To the best knowledge,

this issue has not been investigated for Sweden. The aim of the current paper is to fill this gap in the literature. We test for the long run relationship between these two important macro aggregates by conducting tests for cointegration with two unknown structural breaks. The results show that there is a long run relationship between tourism receipts and the GDP in Sweden. The elasticity is around 0.99, which decreases during the oil shocks in the 1970s. In addition, the null hypothesis that tourism receipts does not cause the GDP can be rejected at the conventional significance level using the bootstrap causality test. Thus, the tourism led growth hypothesis is supported empirically in Sweden. This Scandinavian country offers tremendous opportunities to foreigners that are interested in winter sports during colder periods. Swedish long summer's days have also a lot to offer to tourists, for not mentioning the beautiful forests and natural scenery that the country possesses all around the year. The well-known friendly and peaceful nature of the Swedish people also appears to pay off in economic terms via the tourism channel.

Compliance with Ethical Standards

The authors declare that there are no conflict of interests.

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