Seasonality, infrastructures and Economic Growth in Touristic Islands

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ABSTRACT

Tourism is the main economic activity in some small islands that have became very dependent on this activity. Sun and beach destinations are characterized by high levels of seasonality, with consequences on unemployment, economic activity diversification and GDP per capita. This paper analyzes the empirical evidence from the Balearic island of Mallorca, one of the most important touristic destinations in Spain. This research has analyzed the existence of correlation between seasonality and unemployment, GDP per capita, housing prices, the paper also examines the importance of location and infrastructure. The variable with a highest explanatory capacity in terms of GDP per capita is the distance to the airport. National and regional governments must consider the importance of infrastructures and the role seasonality plays in economic growth and economic activity diversification; the understanding of these relations will help to develop the most adequate public policies.

KEYWORDS

1. Introduction

Tourism and related activities is one the industries with a higher impact in terms of economic activity, representing in 2016 around 10.2% of the World Gross Domestic Product and 10% of total employment worldwide (World Travel and Tourism Council, 2016). Economist have analyzed the relation between tourism and economic growth either from a theoretical perspective (Hazari and Sgro, 2004) or empirical (Dritsakis, 2004); supporting the idea that tourism activity can lead to a higher economic growth. However, tourism activity can create some negative impact, with the idea of a situation of Dutch Disease as one of the most important ones (Nowak and Sahli, 2007; Capo et al. 2007). In a situation of Dutch Disease the increasing demand on tourism can lead to a situation in which the investment directed to the tourism industries leads to a crowding out effect for investment in alternative industries, generating as a final effect a loss in the net welfare. This situation has been examined mainly for small islands in which tourism ranks as top economic activity. In some islands the importance of travel and tourism expenditure as a percentage of the GDP makes clear the high level of dependency on this industry; 96.5% in Maldives, 62.1% in Seychelles, 43.2% in Cabo Verde or 27.7% in Malta (World Travel and Tourism Council, 2016).

Many touristic small islands can be considered sun and beach destinations, in which tourist are attracted by the weather and the beauty of the natural landscape. This tourism is very dependent on climate conditions, making the economic activity highly correlated with the season (Donatos and Zairis, 1991; Baum and Hagen, 1999; Conell et al, 2015). One of the main objectives of many regional and local governments has been to extend the duration of the peak demand season and to reduce the level of seasonality, but this is a difficult task affected by many factors out of the control of policy makers.

In the context of the importance of tourism Spain is a clear example of how tourism has mixed effects. The financial crisis that started in 2008 was a extremely difficult period for the Spanish economy with the level of unemployment rocketing from less than 10% to more than 25% in 2013.Tourism is one of the activities that has helped to create employment and has shown as steadily and consistent growth in the last decade. International tourist arrivals have reached a maximum of 75.3 million international tourist arrivals in 2016 compared with 58.5 millions of international tourist arrivals in 2006

(Spanish Statistical Office INE, 2016). But there is also an open debate about negative effects that tourism can have in terms of public space congestion, effects on housing prices or the excessive dependence of just one economic sector. Spain has different touristic destinations but many of them can be considered sun a beach touristic destination, with the Balearic Island and Canary Islands leading the positions of this kind of tourism activity. Table 1 shows the evolution for the island of Mallorca (Spanish Statistic Office INE, 2016), the biggest one of the Balearic Islands.

Year	International tourist arrivals	Number of beds available
2009	9,024,039	149,495
2010	9,201,824	151,014
2011	10,111,333	150,701
2012	10,365,710	150,336
2013	11,057,460	152,071
2014	11,348,260	154,251
2015	11,649,470	152,973

Table 1. Interantional tourist arrivals to Mallorca.

As the rest of the Balearic and Canary islands, Mallorca shows a clear pattern of high seasonality; considering the last year with complete information, 2016, in February a month will low demand 164,725 international tourist arrived to the island compared with 2,359,277 tourist in July, the month with the maximum number of arrivals (Spanish Statistic Office, INE, 2016).

This paper has analyzed data for 15 different towns of Mallorca, which differ in their level of seasonality. This research has two main objectives, the first one is to analyze if GDP per capita, unemployment or housing prices are correlated with the level of seasonality, the second one is to understand the importance of adequate infrastructures and if the distance to the main entry point of tourists, the airport, is an explanatory variable for GDP per capita differences. The structure of the paper is as follows, section 2 summarizes the literature review, section 3 clarifies the data and methodology used and the final section covers the main results, their discussion, and future lines of research.

2. Literature review

Seasonality is defined as temporary different impact of tourism, measured by number of tourists, expenditure by tourists, traffic or employment, through the year (Butler, 2001). Seasonality is one of the main characteristics of many touristic destinations (Commons and Page, 2001; Cuccia and Rizzo, 2011, Bigovic, 2012). Scholars have studied the effects that seasonality has in the tourism industry including its effects on profitability, the challenge it suppose for hotels managers, the options policy makers have to try to reduce it or its relation with economic growth.

Hospitality industry is characterized by high fixed cost and a lower occupancy rate in the low demand season affects directly the firm's financial performance (Jeffrey and Barden, 2000). In the competitive environment in which hotels develop their activity differentiation and innovation can help to improve financial performance; Orfila-Sintes et al. (2016) found statistical evidence of a higher effort in innovation by hotels opening all the year rather than just on the peak demand season. Seasonality not only affects the firm performance, also affects the quality of life to people living in these areas. Seasonal employment, underemployment and unemployment are labour market characteristics associated to geographic areas with peak and low demand seasons (Jolliffe and Farnsworth, 2003), in this context firms must decide if to embrace seasonality or to challenge it. However, the policy makers' efforts to reduce seasonality show a mix of results (Koening and Bischoff, 2004) with strategies as diversifying the touristic offer to attract potential new customers in the low demand season, implementing events and festival in the period with less tourist flows or identifying new segments markets with more willingness to visit the area out of the peak demand season.

Most scholars agree that seasonality have negative impacts, the low return due to the difficulties of obtaining adequate revenues in the low demand season act as a barrier for attracting new investment (Getz and Nilsson, 2004); in terms of labour market seasonality makes more difficult to retain talented and skilled workers (Chung,2009). According to Balaguer and Cantevella-Jorda (2002) Spanish economic growth has benefited from tourism, however, high seasonality has a negative impact in productivity levels, hence, with a negative impact on GDP per capita in high seasonality tourist destinations (Croes, 2003).

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A topic that scholars in the field of tourism have addressed is tourism in islands (Gayle, 2002; Sheldon, 2005; Scheyvens and Monsen, 2008). The geographical constrains related to be and islands make difficult to rely on a competitive manufacturing sector and as a consequence the size of tourism in terms of GDP is especially significant in some of them. Obviously, not all villages will benefit to the same extent from the economic activity related to tourists' flows, the location of each village would be a fundamental factor in explaining the importance of tourism activity. Nevertheless, what becomes a relevant decision is the transport infrastructure and where to locate it, because adequate infrastructures would be crucial in developing the tourism industry. Modelling demand has shown that appropriate infrastructures is an explanatory variable with a positive correlation with number of tourists (Khadaroo and Seetanah, 2007). In particular, using regional data several authors have found that the stock of public capital affects positively economic growth, with a significant and positive income elasticity to public stock. This research focus not at regional level, it looks at the evidence from villages in Mallorca with an important touristic sector, considering the distance to the airport as a variable that measure the positive effects associated to transport infrastructures.

Considering the previous literature review the hypothesis proposed are:

H1: Seasonality has a negative impact in the level of GDP per capita.

H2: Higher seasonality positively correlates with higher levels of unemployment.

H3: GDP per capita is positively influenced by being near to the Airport.

3. Data and Methodology

To test the hypothesis about seasonality and the effects associated with a nearest location to the Airport data from the island of Mallorca has been selected. Mallorca is one of the most important tourist destinations in Spain, attracting every year more than 5 million international tourists. It is an important sun and beach destination, and as a consequence seasonality is a relevant phenomenon. There are many different alternatives to measure seasonality (Karamustafa and Ulama, 2010), in this research we have measured seasonality using the Gini Index, a well-known indicator used mainly in the measure of inequality income or wealth distribution, but that using the adequate transformation can

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be useful in measuring seasonality. According to Lundtorp (2001) the Gini Index can be measured in tourism as proxy for measuring seasonality considering a demand or supply variable that shows a seasonal pattern. In this article we have considered the number of beds available each month at the villages that have been object of analysis. We define xi as the number of beds available in the month i (with i taking values from 1 to 12, ordering the 12 months from the one with the lowest supply to the one with the maximum value); yi is defined as the accumulative number of beds from the first month considered to the month i. The formula to figure out the Gini Index is:

$$G = \frac{2}{12} \sum_{i=1}^{12} (x_i - y_i)$$

This indicator takes values from 0 to 1. The extreme value of 1 corresponds to a situation in which all available beds in the year are only available one particular month; the value of 0 corresponds to the lowest level of seasonality and it reflects a situation of homogenous distribution of beds available through the year; a higher value of the indicator is a measure of higher seasonality.

The data related to the 14 villages selected, all of them Mallorca municipalities with tourism as an important contributor the economic activity proceed from the Statistical Office of the Balearic Islands (IBESTAT, 2016). The variables considered have been hotels' room available each month (2015), percentage of the employment in the hospitality industry, total population, distance to the beach, distance to the airport, rate of unemployment, Gross Income per capita and number of firms per capita, the values correspond to the last available data, 2016. Table 2 summarizes the values corresponding to each village, being them ordered from the lowest to the highest level of seasonality.

Village	Gini Index, seasonality	Population	Hospitality workers as a share of employment	Unemployment	Gross Income per capita	Distance to the beach (Km)	Distance to the airport (Km)
Calvià	0.3933778	50,328	21,747%	14,68%	26,530€	9,2	30,7
Sóller	0.3981364	13,684	15,066%	11,24%	24,860€	0	31,9
Pollença	0.422354	16,115	15,671%	15,48%	24,136€	0	60,7
Capdepera	0.453831	11,420	22,646%	16,79%	18,665€	0	73,2
Son Servera	0.45433	11,449	25,982%	19,26%	19,293€	0	64,2
Muro	0.463523	6,723	9,087%	15,90%	20,066€	0	57,1
Sant Ll. des Cardassar	0.46852	8,146	15,476%	12,59%	19,753€	0	59,3
Manacor	0.47057	40,170	7,570%	18,59%	21,148€	16,2	50,9

Ses Salines	0.47315	5,018	21,989%	15,56%	22,139€	0	45,7
Santanyí	0.4911	11,316	20,199%	17,55%	21,792€	0	48,6
Andratx	0.5000	11,093	20,456%	14,75%	23,482€	7,2	39,6
Alcúdia	0.5090	19,763	26,328%	18,26%	22,083€	0	59,6
Santa Margalida	0.5099	11,672	19,789%	16,04%	21,825€	11,2	56,2
Llucmajor	0.5977	34,618	13,036%	17,59%	24,953€	17,6	21,7

Table 2. Seasonality and main economic variables.

The first hypothesis to test is the negative effect that a high seasonality has in terms of income per capita. Applying the Shapiro-Wilk test we accept that both variables follow normal distribution, hence, their correlation is tested using the Pearson correlation coefficient. The correlation coefficient is negative, -0.085 but is not statistically significant, and hence, the first hypothesis is not accepted.

The second hypothesis tests the existence of a relation between seasonality and higher levels of unemployment. The Pearson correlation is 0.461, but again not significant. Villages with a level of seasonality below 0.45 show an average rate of unemployment of 15.49% whereas the villages with seasonality above 0.50 have an average rate of unemployment of 17.30%. Table 3 summarizes these values. These values suggest that working with a higher sample of villages and considering more sun and beach destination would be worthy in terms of concluding the existence of a relation between unemployment and seasonality.

Level of seasonality	Average rate of unemployment
Below 0.45	15.49%
Between 0.45 and 0.50	15.82%
Above 0.5	17.30%

Table 3. Seasonality and level of unemployment.

Public capital stock, infrastructures, and in tourism transport infrastructures are a key element in economic development, the fourth hypothesis test the existence of positive relation between distance to the airport and GDP per capita. The Pearson correlation is -0.826 with a p-value 0.000, hence, this relation is accepted at 1% significance level. In fact, testing the regression model:

$$Gross\ Income\ per\ capita_i = \beta_{o} + \beta_1\ Distance\ to\ the\ airport_i + \varepsilon_i$$

Table 4 shows the results.

Model	Values	
R square	0.682	
R square adjusted	0.656	
ANOVA F(1,12)	25.786	p-value 0.000
Constant coefficient (intercept)	28,856,319	t = 21.178 p-value 0.000
Airport distance (β)	-133.384	t= -5.087 p-value 0.000

Table 4. Regression model analysis.

According to R square and R square adjusted the difference sin Income per Capita can be partially explained by how far is it village from the airport. The β value implies that each kilometre far away from the airport reduces the Income per Capita in 133.384€. As a consequence of this fact the decision about how to locate the strategic infrastructures that tourism development needs can have a definitive impact on income distribution and regional inequality.

4.   Results and Discussion

Scholars have analyzed the impact that seasonality has in firms' performance, human resources management, economic growth or employment. Most of the academic literature agrees that reducing seasonality can have a positive impact and in fact many touristic regions have tried to apply policies to reduce seasonality with mixed results. Many of the empirical studies haven considered regional data, in this context this paper has analyzed municipalities' data, trying to compare if villages in the island of Mallorca with different levels of seasonality show important differences in relevant economic variables.

Unemployment rate correlates negatively (-0.826) with seasonality, however the result is not statistically significant; future research considering a biggest sample of municipalities data would be useful in understanding how seasonality impacts on the labour market. The correlation found between GDP per capita and seasonality was weaker and not significant, perhaps a possible explanation is that employment in the hospitality industry is lower as a percentage of total employment; villages with more seasonality has to develop

alternative economic activities with higher productivity that compensates the negative effect caused by seasonality; this would be an interesting line of future research.

To analyze how important is the location of the airport in an island that depends to a great extent on tourism a regression considering GDP per capita as a variable depending on the distance to the airport has been used. The results are significant and interesting. Each kilometre of distance to the airport reduces GDP per capita in 133.384€; distance to the airport matters, and the model has certain capacity to explore differences in GDP per capita, R square adjusted being 0.656. This an interesting result not only for scholars, also form policy makers that must consider how the location of the transport infrastructures can affect GDP per capita at municipalities level and have important consequences on terms of inequality. Future research that widens this analysis to other touristic islands would be extremely useful in a better understanding of the relations between public capital stock and economic growth in touristic islands.

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