Universitat de les Illes Balears

MASTER'S THESIS

A COUNTERFACTUAL ANALYSIS TO MEASURE THE IMPACT OF THE COVID-19 ON THE ECONOMICS OF TOURISM IN THE BALEARIC ISLANDS

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Master's Degree in Economics of Tourism

(Monitoring techniques applied to the Tourism)

Centre for Postgraduate Studies

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ABSTRACT

The aim of the study is to examine the impact of the COVID-19 on the Economics of Tourism in the Balearic Islands. To do so, a counterfactual analysis was adopted, using official data from the Statistics Institute of the Balearic Islands. The analysis covers mainly the effect of the COVID-19 outbreak in two important variables for the tourism industry which are the arrivals and the expenditure and their observed effects to the unemployment and in to the evolution of the GDP of the Islands. This study develops a counterfactual framework which with this approach is possible to estimate and highlight the real impact of the COVID-19 in the economics of tourism in the Balearic Islands which was an 81% drop in the total arrivals and a loss of production through tourism expenditure of approximately 13.716 millions of euros, or in percentage terms, a drop of an 84% respect to the constructed counterfactual scenario for the 2020 season.

1. INTRODUCTION

The COVID-19 outbreak caused dramatic consequences worldwide since the economy has stopped abruptly by early 2020. One of the characteristics of this disaster was the restriction of the mobility translated to severe lockdowns worldwide in a try to stop spreading the disease.

In fact, for this issue, the tourism industry was one of the most affected industries because of the mobility restrictions. Note that the tourism bases their activity on the mobility of people from an origin to a destination by force. So, once the mobility is restricted, then all the tourism system is in danger.

This analysis will cover the impact of this pandemic outbreak in the Balearic Islands, a region which is mostly based in the Tourism Sector being one of the most important sun and sand destinations in Spain, well positioned in the market where the impact of the COVID-19 has been devastating for the economy of the Balearic Islands.

So in this research, and thanks to a counterfactual analysis, it is going to be projected how the season 2020 should have been, pretending the pandemic never took place. The difference between what should have happened according to the models and what have happened in reality, could be considered the impact. The analysis has been performed about two important variables in the tourism Sector, on the one hand, the arrivals and on the other hand, the tourism expenditure and observing what were the consequences on the unemployment and the GDP in the Balearic Islands.

This way, the impact is not limited to the comparison between the 2019 and 2020 disrespecting the trends and regular paths of the evolution of the data. And could be useful for cost benefit analysis in future similar occasions when an intervention is needed to stop to spread of a similar disease or to be the base of a recovery predictions path.

2. LITERATURE REVIEW

In order to develop this literature review, a compact chronology of COVID-19 will be presented and how is the situation nowadays. Once the problem has been exposed, a review of what authors and authorities have been written about the impact of this pandemic in the economy in general and specifically in the tourism industry. To close this section, the model will be presented and point up how it stands in the recent literature.

As said, a little look back to refresh how this COVID-19 pandemic occurred highlighting some key points in the chronology. According to Zhu et al. (2020) some cases of a strange pneumonia were reported in December, 2019 and the cause was linked to a Market in Wuhan, China.

As stated by Brodeur et al. (2020) after a month, in January, the World Health Organization identified the COVID-19 and a rapid spread of the virus was observed. The first death from COVID-19 in Europe was confirmed in France by February the 15th, 2020. From that moment on, over 100 countries reported similar cases. Finally, the World Health Organization declared COVID-19 a pandemic by March the 11th, 2021.

The generalized response from the different governments was to set a partial or complete lockdowns in their countries, restricting the movements in their borders. Obviously, travel restrictions were placed between countries, in fact, the UNWTO reported by April 20, 2020, that all major tourist destinations implemented travel restrictions because of the COVID-19 pandemic.

Up to this point severe slowdown of the general economic activities were expected worldwide, especially in the tourism industry because of the nature of movement between countries of this activity.

In search for a solution, by August 2020 the first COVID-19 vaccine was registered by the Russian Government. (developed in less than 8 months). After that, other vaccines were developed and approved to use in Europe. *(Moderna was approved by December, 2020 and Pfzier by January, 2021.)* The vaccination procedure in Spain started immediately, by December, 27th 2020.

Note that at present we have tons of information, but both the citizens and authorities even researchers had a high level of uncertainty in these moment last year. That's why in this volatile situation, is suitable to explain how Governments are dealing with partial openings, lockdowns and vaccination procedures.

Nowadays seems that the spread of the COVID-19 is stable in the developed countries. Based on data form the WHO (World Health Organization) up to now, the epidemic figures are more than 140 millions of confirmed cases worldwide with a total of 3 Million deaths with COVID-19. The vaccination procedure is making good progress and an exponential increase in the figures is expected in the following months. The country leading the vaccination procedure worldwide is Israel with more than the 50% of their population vaccinated while the vaccination in Spain is around 7% with expectations of reaching the 70% in August.

Having said that, more than one year later, many researchers in the field of Economics and Tourism are interested in the real impacts of this pandemic, how is the best way to measure it and how and when the recovery will be.

Seems that many authors as Škare, Soriano, and Porada-Rochoń (2021) agrees that this kind of pandemics are not new. Although it will be difficult to compare with another crisis because the effects of this one are expected to be, by far, much larger than any other studied up to now. The reason is basically because it is the first which have been rapidly spread worldwide and not only in some regions (as others in the past.)

According to the Barometer provided in January by the World Tourism Organization (2021) the effects of the COVID-19 pandemic reduced in 1 billion the international arrivals, and the general situation is comparable with 30 years ago. Basically, the tourism suffers the most severe impact up to now with a drop of more than 74% of the International Arrivals. This crisis is expected to be 11 times worse than the global economic crisis in 2009 and can affect from 100 to 120 million jobs in the sector.

As Zhang et al. (2021) assures in their publication, the tourism activity is the principal economic sector in many countries worldwide and it have a representative part of the local gross domestic product. Nevertheless, tourism is one of the most sensitive industries. Probably this COVID situation is one of the worst worldwide circumstances that we have seen up to now with incomparable impacts at all levels.

Many researchers have written during years about the impacts of natural catastrophes or even other pandemic which occurred but they were concentrated in some specific regions and countries. Unfortunately, this is a worldwide problem and for that reason many researches in and out of the field of Economics are interested in the implications of passing through it.

In the field of Economics and tourism, there are different ways to measure this impacts, researchers used quantitative and qualitative methodologies or even a combination of both in order to estimate the impact and to design possible recuperation paths.

The literature about this topic is not old because of obvious reasons but it has been a common topic recently within the researchers.

For example, the approach of Škare et al. (2021) is quite interesting since assumes that pandemics are not new. In order to estimate the potential impact of this COVID-19 they used data from other pandemics and how it affected to the Travel and Tourism Industry. Once the most important outbreaks during the last 50 years were reviewed, they modelled the COVID-19 shocks based on the data from the past outbreaks. Finally, they conclude saying that the negative effects will be far from observed during last pandemics.

Zhang et al. (2021), in a search of a tourism recovery path in Hong Kong, assures that statistical methodologies are unable to predict effects of unanticipated events as for example the COVID-19. Additionally, the traditional approaches of forecasting are not useful to predict the recovery of this kind of crisis because of the uncertainty and volatility of this issues. That's why they proposed a combination of both quantitative and qualitative techniques.

On the one hand, the quantitative techniques were used in order to perform an econometric modelling and on the other hand, qualitative techniques such as Delphi technique and scenario based analysis in order to adjust the expectations and scenarios. Finally, they used the forecasts to measure the economic implications of the COVID-19.

But there are other techniques which can put lights on the measurement of impacts and also can be the first step to eject forecasts for the recovery. It is the counterfactual analysis, which usually includes quantitative techniques to generate a hypothetic reality where some event never occurred to realize how a situation changed respect of what was expected to happen. In the following part of this literature review some publications are going to be commented on how they applied this idea.

In that sense, the counterfactual analysis proposed by Cavallo et al. (2013) to measure the impact of natural disasters using one of the principal indicators of the economy, the GDP. This approach was to design an appropriate counterfactual scenario without the effect of the catastrophe and then compare it with the real evolution of the GDP observed.

It's right that this topic is not related with any pandemic but with catastrophes such as earthquakes, tsunamis or hurricanes and maybe a little interpretation is needed to understand the COVID-19 as a catastrophic natural disaster.

The principal pro this model have is that the natural disasters are sudden and hard to predict with much advance, so the previous data of in this case, the GDP is free of this event, then, to perform the forecasting become relatively easy or in other words is not that complicated as Zhang commented. Because of two reasons, firstly, the vast amount of past data to perform the forecast and secondly, the avoidance of the outbreak.

This is exactly the same as with the COVID-19. Note that looking to both the chronology and the variance in the data, we can observe when the first event and when the firsts effects occurred, and then perform the "counterfactual free of COVID-19" scenario. This is something in that the following case were not accurate, because the behaviour of the people slightly changed and biased their "reality" in the counterfactual results. This is the case of the publication by Born, Dietrich, and Müller (2021) who studied through the counterfactual analysis the consequences of not applying the lockdown in Sweden. The issue was that when in all around Europe the countries were taking the decision of setting lockdowns in their regions, Sweden decided not to apply it.

According to the authors it was a kind of trade-off. The discussion was that when a lockdown is set in a country, the spread of the COVID-19 is obviously limited but at the same time, doing so, there are economic costs. Up to this point, they thought that is important to quantify through a counterfactual analysis the two scenarios in order to do better decision making. Finally, they conclude that with proper lockdown, Sweden should have reduced infections by 75% and deaths by 38%.

To finish with this case, the authors realized that the population slightly changed their behaviour (a kind of personal lockdown) even if there were no restrictions, so in this case, the reality from the counterfactual "could be biased." This should be taken in account when a counterfactual analysis is performed.

Following with this technique, we assume that the difference between what has happened in reality and what would have happened in the hypothetical counterfactual scenario is equivalent to the impact or damage of in this case, a pandemic. It's important that the data should not be biased because of the impact itself or the behaviour of the people passing through this issue.

To finish with a similar application on the COVID-19 situation commenting on the work by Athanasopoulos and Hyndman (2021) who used statistical models of historical data to generate COVID-19 counterfactuals forecasts as if the pandemic never occurred.

They reviewed some key factors of the Tourism in Australia such as International and Domestic Arrivals and purpose of travel. And then, they plot how the recuperation path should look like performing some scenarios of recovery.

We should take in account that usually the crisis are the result of a long time dynamics which finally become in a crisis i.e an economic crisis in which we can determine which are the determinants but at the end, is very difficult to establish when was exactly the beginning. The contrary happens with the natural catastrophes and in this case, with the COVID-19.

Note that we have a consistent chronology and we can know exactly when it was reported for the first time and when it began to have effects on the time series, this fact gives us the possibility to the researchers to apply in a consistent way the counterfactual analysis.

So our exercise will be performed using the counterfactual analysis to determine what was the impact of the COVID-19 to the Economics of Tourism in the Balearic Islands. As seen, the use of this counterfactual analysis technique is (a priori) appropriate because of the disruptive change of the reality due to the COVID-19.

We also count on a consistent chronology through we can know exactly when it was reported for the first time and when it began to have effects on the data, so the counterfactual forecasts will be free of the sudden issue and the results are not expected to be biased by the problem itself.

There is a necessity to focus in the gap between the forecasts and the real path of the data, doing so, the idea is to demonstrate in a relatively simpler way how the reality has changed versus what was expected taking in account trends and economic cycles.

Finally, it will be important to concentrate the efforts in doing this analysis in the most visual way as possible in order to easily understand the implications of passing through the COVID-19 in the Balearic Islands, where the tourism industry represents a high percentage of the GDP.

Additionally, this exercise could be useful to provide new horizons to the recovery of the Economics of Tourism in the Balearic Islands and be useful for cost benefit analysis in future similar occasions when an intervention or a policy is needed to apply in order to quickly react and stop the spread of a similar disease.

3. METHODOLOGY

A counterfactual analysis has been proposed to perform this study. Generally speaking, this kind of methodology measures what would have happened in absence of some relevant issue and compare it with the real path of the data, it is, taking in account the effect of the relevant issues studied.

This methodology has been proposed to perform in the Balearic Islands in order to measure the impact of the COVID-19, where the expected situation was far from what happened in reality during the 2020 season on. The objective of this study is to measure the impact of passing through a pandemic outbreak for the Economics of Tourism of the Balearic Islands. This study could be useful to take in to account for possible cost-benefit analysis in similar situations in the near future or to better draw recovery paths of the touristic sector in the Balearic Islands or similar mature destinations.

In order to reach the objectives, this research is going to have three different steps to properly complete the analysis;

In section one, it is going to be analysed what have happened in reality with the evolution of the arrivals to the Balearic Islands, tourist expenditure and the observed evolution of the unemployment and the variation of the GDP.

In section two, based on past data, counterfactual forecasting models are going to be constructed pretending the COVID-19 never took place in the Balearic Islands, and analysing how should have been the reality in a hypothetical pandemic-free season.

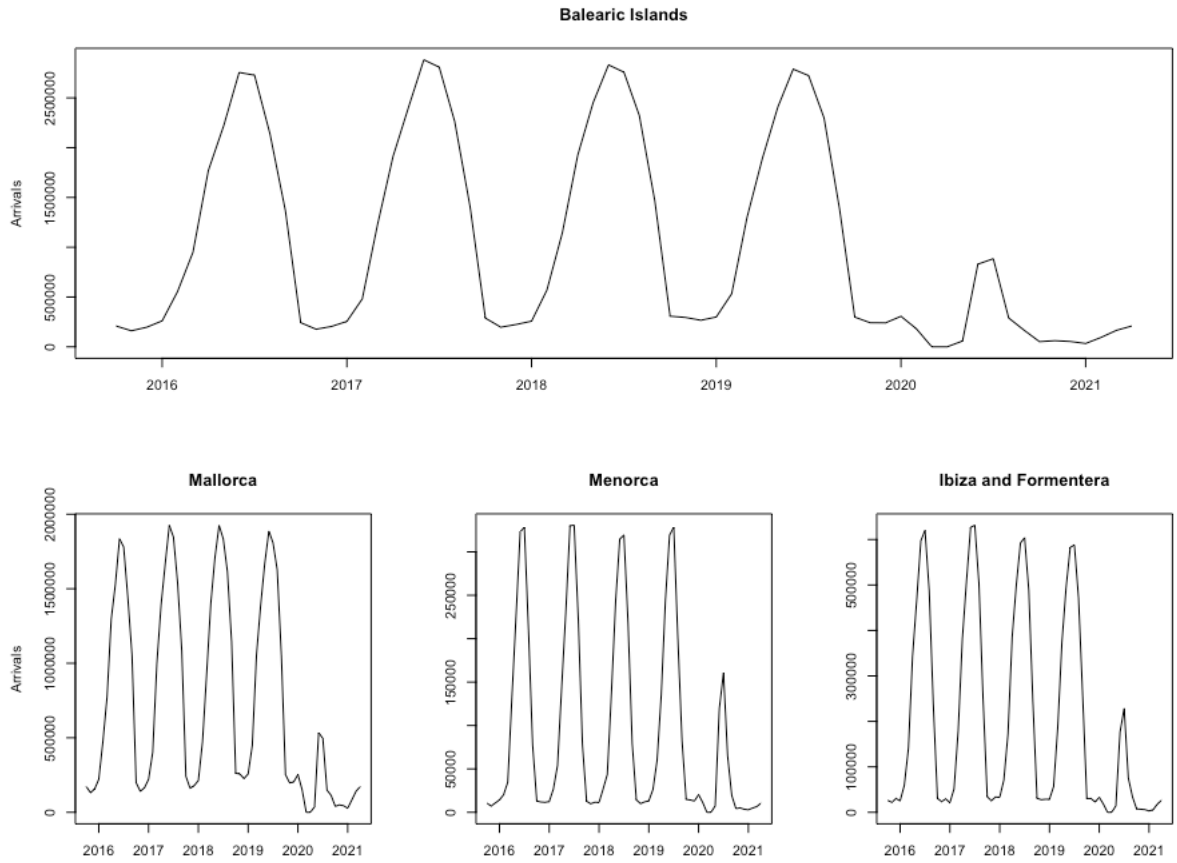
Finally, to present the results representing the gap between the analysis in section one (Real path of evolution of the data) and Section 2 (Counterfactual path of evolution of the data). The gap between these two scenarios will represent the impact in the Tourism Sector in the Balearic Islands in the different variables of study.

This application of counterfactual analysis is going to be generated with a database extracted from the *IBESTAT (Instituto de Estadística de las Islas Baleares).* This data is public, free and available for anyone interested in.

Section 1. Real evolution of the data

Arrivals as one of the most important variables of study in this situation (as said in the introduction) because the mobility restrictions impacted to the nature of the tourism, it is the mobility from origin to destination.

Figure 1. Total Arrivals to the Balearic Islands from 2016 to 2021



Source: own elaboration from IBESTAT

This time series data includes all the tourist arrivals to the Balearic Islands and span the period from October, 2015 to April, 2021. Including in the data the evolution of the effects of the COVID-19 outbreak. This data was extracted from *IBESTAT (Statistics Institute of the Balearic Islands).*

It can be observed in these series a strong seasonality at least, from 2016, regularly reaching peaks of arrivals around 2,5 million every year in summer season.

Although there is a strong seasonality (normal in sun and sand destinations) any clear trend can be observed in the series, this fact is due to the mature state of this destination, well positioned in the market attracting similar figures of tourists every year without an evident and systematically growing trend.

February 2020 was the first month with a disruption in the figures due to the COVID-19 outbreak which affected dramatically to the total tourist arrivals in the Balearics changing the regular path of the series.

Table 1. Total Arrivals to the Balearic Islands by year.

Year	Total Arrivals
2016	15.369.927
2017	16.341.033
2018	16.561.348
2019	16.444.775
2020	3.071.905

Source: own elaboration from IBESTAT

In overall terms in the Balearics the total tourist's arrivals decreased considerably in 2020, (13.372.870) this is, in percentage, a drop of 81,3% of total arrivals from 2019 to 2020.

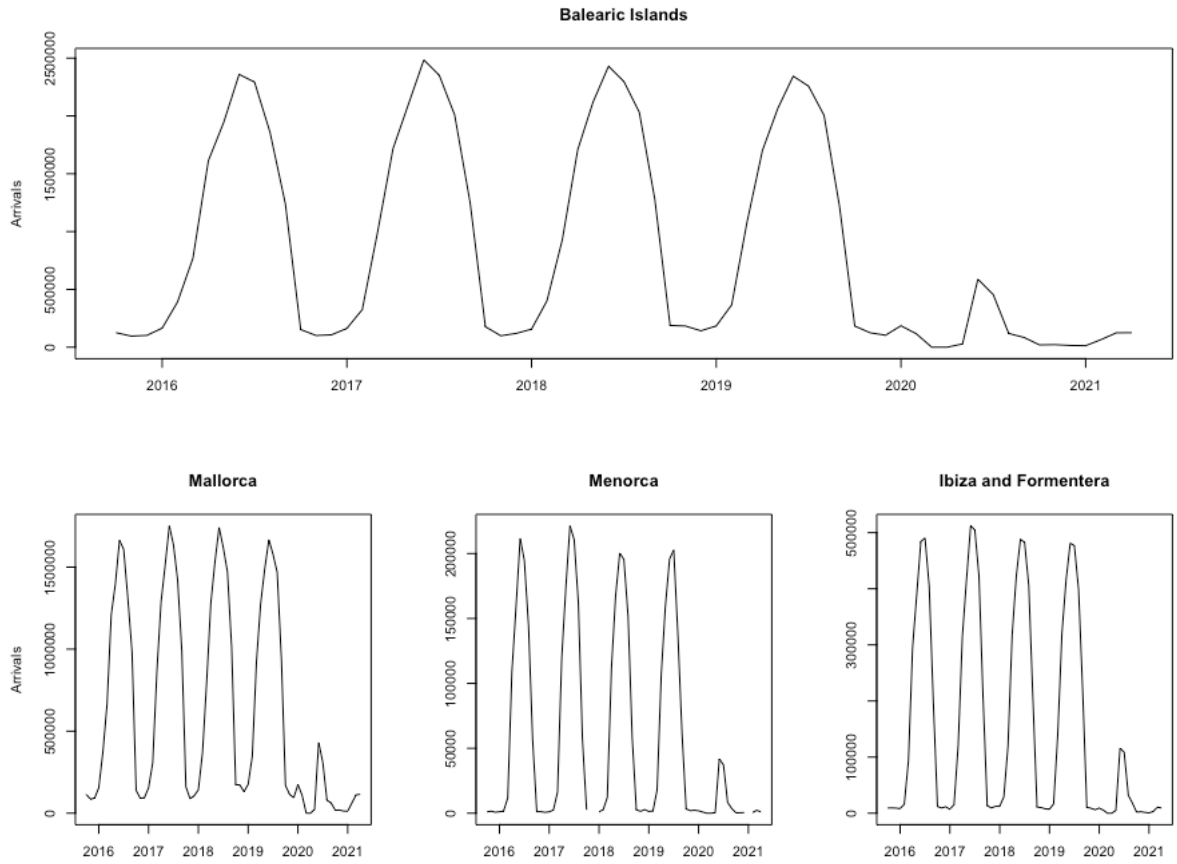
In *Figure 1* the series has been disaggregated by Island. From this groups it can be extracted that similar outbreaks were suffered in all groups but probably Mallorca was the relatively most affected followed by Ibiza and Formentera.

Finally, the relatively less affected island, Menorca with a total of (425.543) total arrivals in the whole 2020 when they welcomed a total of (1.450.184) in 2019, or in other words, the last regular season.

In the next part of this analysis still reviewing the evolution of arrivals but in this case taking in account specifically the international arrivals and domestic arrivals.

International Arrivals

Figure 2. International Arrivals to the Balearic Islands



Source: own elaboration from IBESTAT

This time series data includes the international tourist arrivals to the Balearic Islands and span the period from October, 2015 to April, 2021. Including in the data the effects of the COVID-19 outbreak. All this data was extracted from *IBESTAT (Statistics Institute of the Balearic Islands).*

Regarding the international tourist arrivals seems that the shape is quite similar than in the total tourist arrivals; A strong seasonality (normal in sun and sand destinations) and without any clear trend because of the maturity of the destination.

It should be taken in account that in the Balearics, around 85% of the tourism comes from the international market, so the similarity with the total arrivals is because of the dependence on the international tourism.

Table 2. International Arrivals to the Balearic Islands by year.

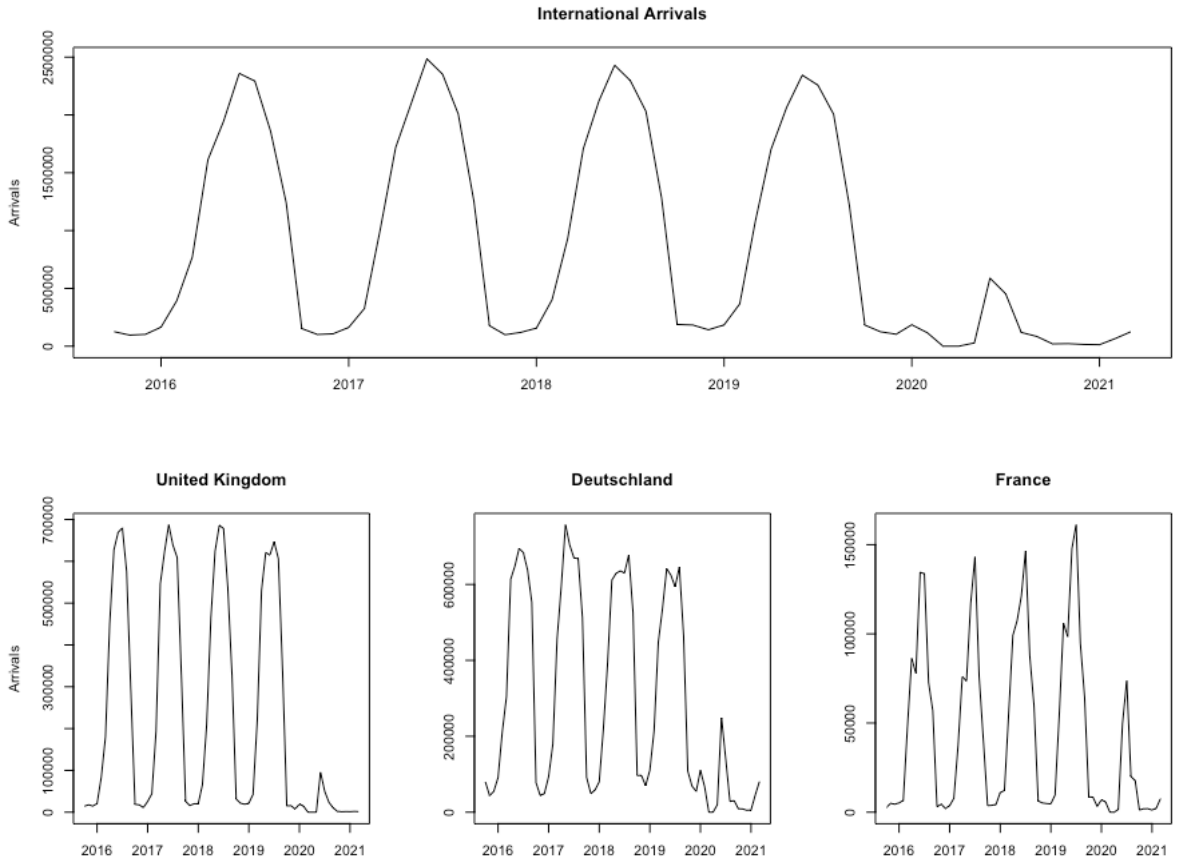
Year	International Arrivals
2016	12.997.549
2017	13.792.296
2018	13.851.598
2019	13.679.781
2020	1.721.320

Source: own elaboration from IBESTAT

Regarding the figures per year, it can be observed how a drop of (11.958.461) International arrivals was seen when comparing 2019 and 2020, it is, in percentage, a drop of 87% of international arrivals.

Regarding the different groups of islands, the effect on the arrivals is more dramatic than in the total arrivals, this fact can be explained with the travel restrictions in the origin countries. In order to have further information about such important markets, it is going to be considered the arrivals by origin in *Figure 3.*

Figure 3. International Arrivals to the Balearic Islands by Main Origin



Source: own elaboration from IBESTAT

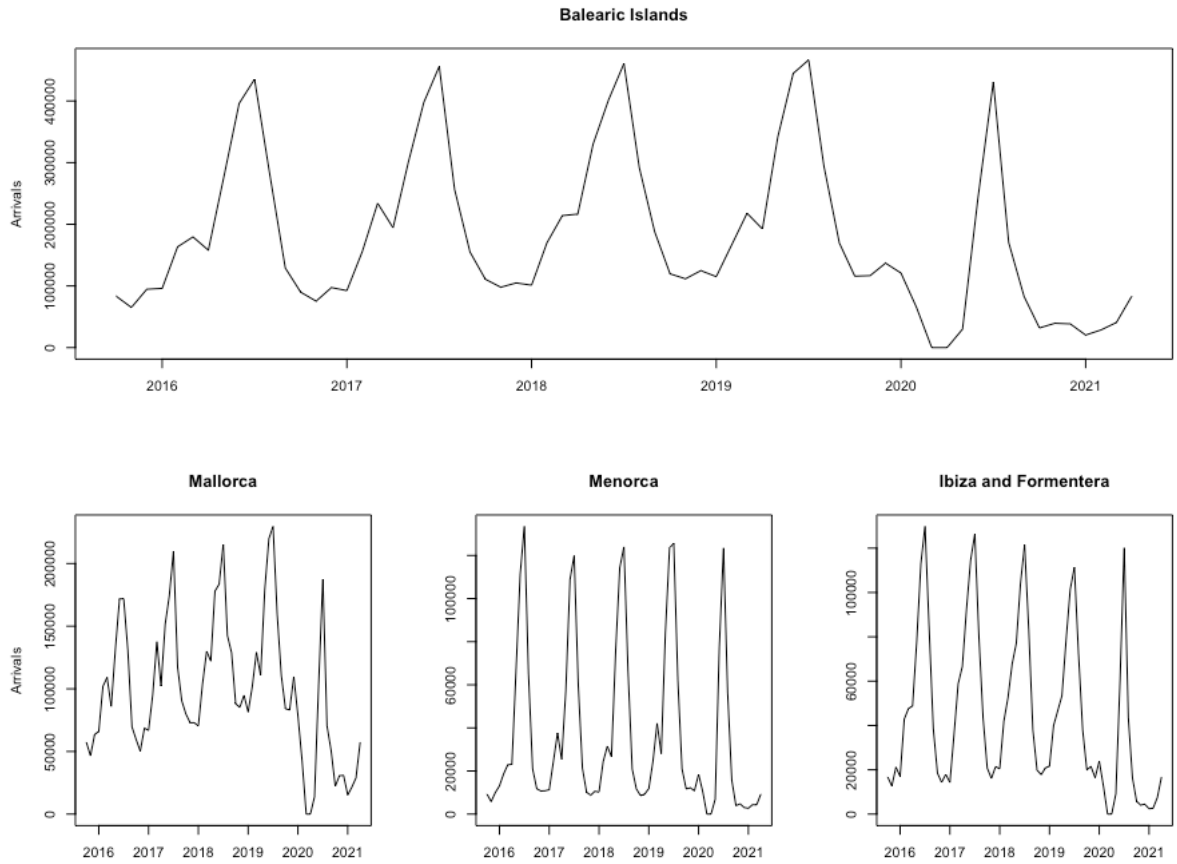
The origin which decreased the most was the United Kingdom market, which have two important characteristics to highlight; on the one hand, it has been the most important market for the tourism industry in the Balearic Islands, and in the other hand it was the most restrictive in terms of lockdowns.

In second place, the Deutschland market which had a moderate negative trend in the arrivals from 2017 up to this point. The COVID-19 outbreak considerably affected the arrivals, but not that much as in the United Kingdom.

Finally, and far from the other two main origins, France have had a positive trend during the last years, but with the COVID-19 outbreak this trend has been abruptly broken.

Domestic Arrivals

Figure 4. Domestic Arrivals to the Balearic Islands



Source: own elaboration from IBESTAT

This time series data includes the domestic tourist arrivals to the Balearic Islands and span the period from October, 2015 to April, 2021. Including in the data the effects of the COVID-19 outbreak. All this data was extracted from *IBESTAT (Statistics Institute of the Balearic Islands*).

In this case the historical shape of arrivals of domestic tourism follow a strong seasonality but slightly different from the International market, it is due to the effect of a national holiday in March/April. This fact helps to attract domestic tourists just before the high season.

Once the COVID-19 outbreak occurred, a dramatic drop in the figures of domestic arrivals also could be seen, but once the lockdown was removed, the relative impact was lower than in the International Market. Nevertheless, this effect is not exclusive just in the Balearics; it was observed in many countries worldwide.

Table 3. Domestic Arrivals to the Balearic Islands by year.

Year	Domestic Arrivals
2016	2.372.379
2017	2.548.736
2018	2.709.750
2019	2.764.993
2020	1.350.587

Source: own elaboration from IBESTAT

Regarding the figures per year, it can be observed how a drop of (1.414.406) in domestic arrivals was seen when comparing 2019 and 2020. it is, in percentage, a drop of 51% of domestic arrivals.

It is going to be analysed the effect by island;

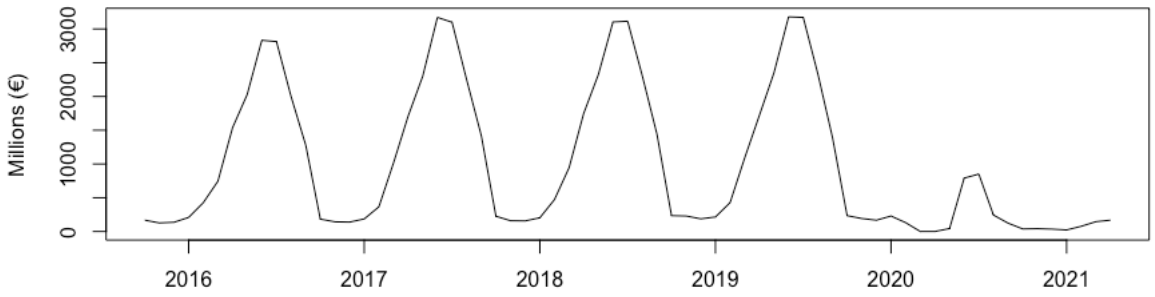
A positive trend in the domestic arrivals to Mallorca was observed at least, from 2016. There was a clear seasonal pattern during the last years. Although a heavy drop can be observed in *Figure 4*. the recovery was very short in time during the high season, reaching a similar peak as in 2016.

Regarding the situation in Menorca, an extremely regular path can be noted during the last years. The effect of the outbreak is not that pronounced as in the case of Mallorca. When talking about the recuperation in the high season 2020 is extremely rapid reaching a similar peak as in 2019.

Finally, as the contrary than in Menorca, the domestic tourism in Ibiza and Formentera have had a negative trend when talking about domestic arrivals since it can be observed a slightly decrease in the domestic arrivals during the last years. Surprisingly in Ibiza and Formentera, once the post pandemics high season arrived (2020), the national tourism has reached a higher peak than in 2019.

Total Tourism Expenditure

Figure 5.Total Expenditure of Tourists with main destination the Balearic Islands in millions (€)



Source: own elaboration from IBESTAT

This time series data includes the total touristic expenditure of tourists with main destination the Balearic Islands (international and domestic) in millions (€) and span the period from October, 2015 to March, 2021. Including in the data the effects of the COVID-19 outbreak. This data was extracted from IBESTAT (Statistics Institute of the Balearic Islands) from a report from EGATUR. It includes all the expenditure in the origin and destination related with the trip accounting separately if he expenses are included in a package or not by 5 different groups of expenditure; 1) expenditure in transportation 2) accommodation 3) maintenance 4) activities and finally, 5) other expenses.

It's important to point out that the Total Expenditure does not completely belong to the Balearic Islands since exists the possibility to expend in the origin and destination.

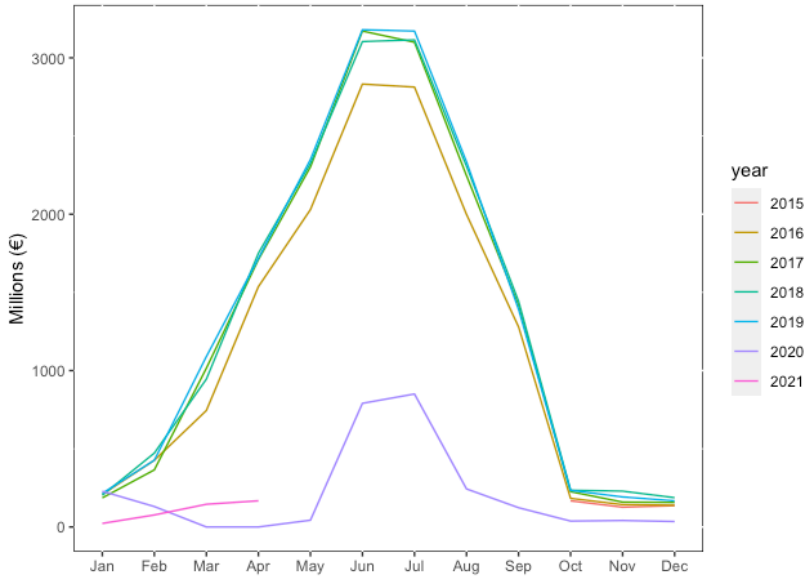
Table 4. Total Expenditure of Tourists with main destination the Balearic Islands by year in millions (€)

Year	Total Expenditure
2016	14.194
2017	16.037
2018	16.285
2019	16.489
2020	2.657

Source: own elaboration from IBESTAT

The disruptive outbreak has had a vast effect on this variable of study dropping the total tourist expenditure in the Balearic Islands to 2.657 (in millions €) when the 2019 the total tourist expenditure was 16.489 (in millions €) There was a drop in the Tourism Expenditure around 84% from 2019 to 2020. It can be observed the difference between the regular seasons and the 2020 and 2021 in the following seasonal plot.

Figure 6. Seasonal Plot of Total Expenditure in millions (€)



Source: own elaboration from IBESTAT

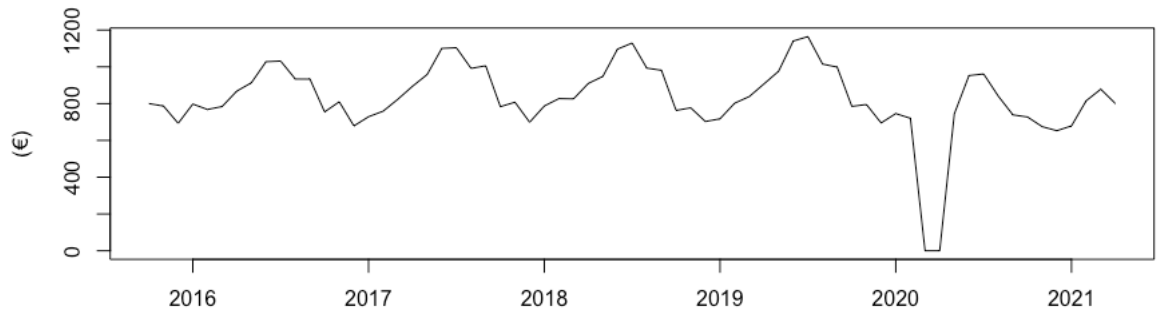
Despite 2016 had a little bit less tourism expenditure in almost all months of the year, the tourism expenditure has had a regular path before the outbreak. The seasonal graph show how dramatic was the situation after the COVID-19 outbreak compared with the regular path of past seasons.

The last data available of Total Expenditure in 2021 show how the situation isn't taking "normal" figures taking lower values and considerably less slope than in the same period in the past.

Expenditure per tourist

It's clear that the total expenditure together with the total arrivals notoriously decreased during and immediately after the pandemics, but it's necessary to analyse if the Expenditure by tourist have changed with this important event.

Figure 7. Evolution of the Expenditure per Tourist with main destination the Balearic Islands



Source: own elaboration from IBESTAT

This time series data includes the expenditure per tourist both International and Domestic in the Balearic Islands and span the period from October, 2015 to March, 2021. Including in the data the effects of the COVID-19 outbreak. *Data was extracted from IBESTAT (Statistics Institute of the Balearic Islands). A report from EGATUR.*

The series have had a moderately positive trend from 2016 up to 2019, it is that the tourists spent more in their trips every year. This series are following a seasonal pattern which can be better observed in the following seasonal plot.

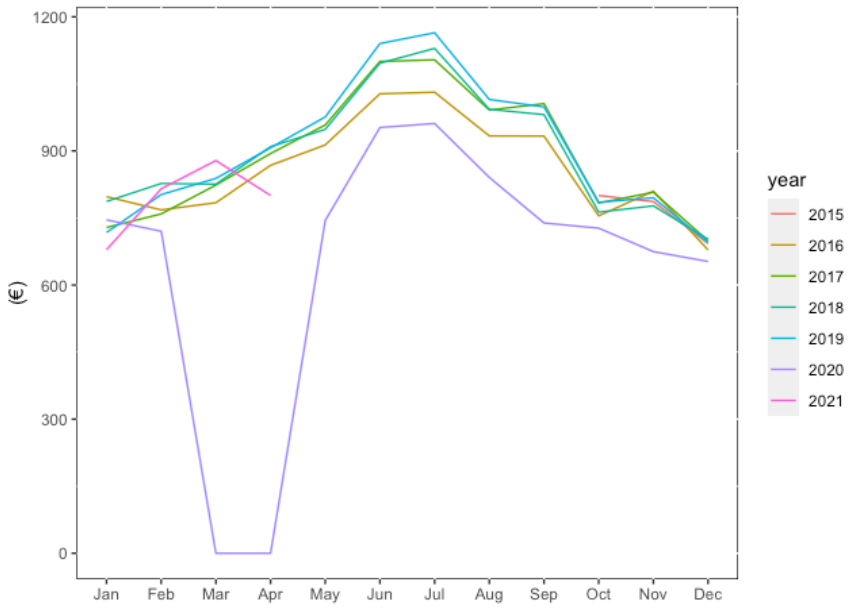
Table 5. Expenditure per Person Balearic Islands by month in (€)

Period	Expenditure per Person
Jan-20	694,87
Feb-20	745,80
Mar-20	720,29
Apr-20	0
May-20	0
Jun-20	744,53
Jul-20	952,39
Aug-20	961,33

Sep-20	840,73
Oct-20	738,79
Nov-20	727,22
Dec-20	674,7

Source: own elaboration from IBESTAT

Figure 8. Seasonal Plot Expenditure per Tourist



Source: own elaboration from IBESTAT

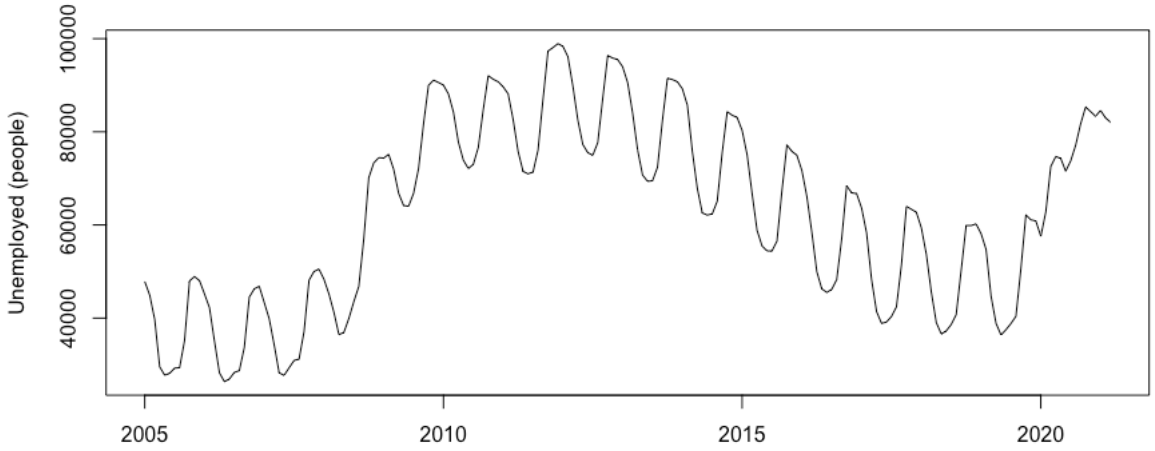
It can be observed how the evolution through the months has been relatively homogeneous during the last years, with a considerable drop during March and April in 2020.

Although there were considerably less travellers, as seen, the expenditure per person, reached similar levels as regular seasons. During the 2020 summer season, the prices drop significantly.

In addition, despite the pandemic outbreak the evolution of the expenditure per person post outbreak is relatively good, reaching in 2021 similar levels of expenditure per person as in the pre pandemic regular seasons. This is a sign of recuperation of the sector and an evidence of a resilient behaviour. Up to this point and as commented in this report, seems that the main problem is related with the mobility restrictions and not in the demand.

Unemployment

Figure 9. Number of Unemployed people in the Balearic Islands



Source: own elaboration from IBESTAT

This time series data includes the number of unemployed people in the Balearic Islands and span the period from October, 2005 to April, 2021. Including in the data the effects of the COVID-19 outbreak. *Data was extracted from IBESTAT (Statistics Institute of the Balearic Islands).*

Reviewing the whole time series data, it can be observed the seasonality in the number of unemployed people, it is in part, because the seasonality of the tourism and the temporary contracts of this industry.

It can be observed a significant increase in the figures in 2008 due to the financial crisis followed by the recuperation path up to 2020. Up to this point and because of the COVID-19 outbreak, the evolution of the data shows how this situation dramatically changed for the worse reaching similar levels of unemployment as in 2012.

Although this is an important indicator, it should be said that this data could be biased because of the unemployment internal counting procedures during the pandemic. The fact of being unemployed was automatically refreshed every month, when in reality this procedure has to be performed in person after a certain time. So probably most of the observation we have in this series are unrealistic.

Regarding to the consequences on the GDP, the pandemic, caused a decrease of the PIB in the Balearic Islands of 23%. This is an outstanding decrease taking in account the variation from 1999 to the last data available in 2020.

Table 6. Variation of GDP in the Balearic Islands 1999-2020

Year	Variation
1999	6,3%
2000	4,7%
2001	3,4%
2002	1,1%
2003	0,6%
2004	1,6%
2005	2,4%
2006	2,8%
2007	3,0%
2008	1,2%
2009	-2,7%
2010	-0,9%
2011	0,6%
2012	0,0%
2013	0,3%
2014	1,0%
2015	3,0%
2016	4,1%
2017	3,8%
2018	2,7%
2019	2,0%
2020	-23,7%

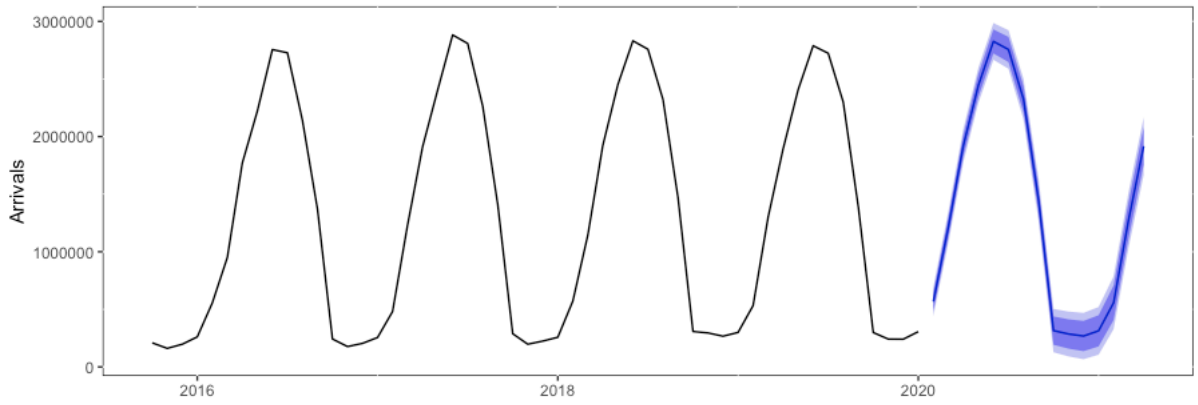
Source: own elaboration from IBESTAT

The last period in where the economy of the Balearic Islands decreased in the GDP before the COVID-19 outbreak was in the economic crisis in 2008 when the decrease was around 3%. When comparing this drop with the (- 23%) in the 2020 show how dramatic was the situation in the Balearic Islands.

Section 2. Presenting Forecasting models:

Once reviewed how was the evolution of the total Arrivals to the Balearic Islands during the last months taking in account the last data available and including the effects of the COVID-19 outbreak, in this case, it is going to be analysed how the season should have been in absence of the pandemic according to the forecasting models. *Figure 5*. shows how the total arrivals to the Balearic Islands should have been in absence of COVID-19 according to the forecasting model.

Figure 10. Counterfactual Forecast of Total Arrivals to the Balearic Islands without the effect of COVID-19



Source: own elaboration from IBESTAT

The best prediction found was an ARIMA model taking in to account the checked models *Appendix 1. Table 27.*

Table 7. Best ARIMA prediction Model for Total Arrivals

Model	AIC
ARIMA (0,1,1) (1,1,0) [12]	983

Source: own elaboration

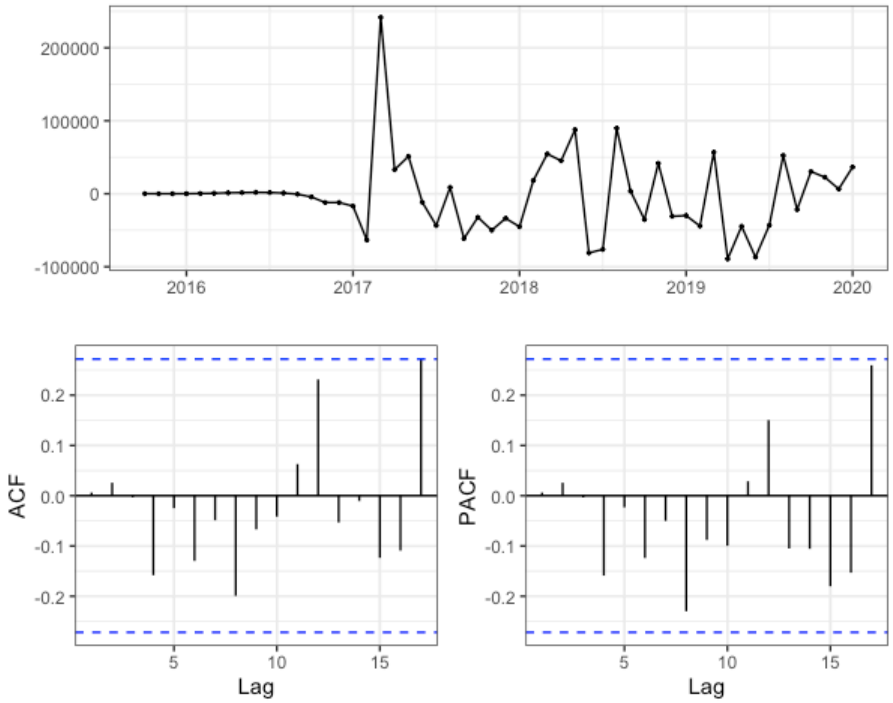
Table 8. Coefficients for the Total Arrivals Forecasting Model

	ma1	sar1
	-0.5975	-0,6209
s.e	0,1541	0,1446

Source: own elaboration

The prediction has been performed with an ARIMA model with AIC = 983 and as it can be observed in the residuals graph, the series seems to be stationary and the residuals have a white noise behaviour.

Figure 11. Summary of Residuals for the Total Arrivals ARIMA model.



Source: own elaboration

Since the series had a strong seasonality and a regular shape during the last years, it was expected to be very similar as in the future, in fact, the forecast follows this logic path.

As seen in the previous analysis, there isn't a clear trend in the evolution of the figures until the COVID-19 outbreak, so the prediction is following logic evolutions taking in account monthly data from 2016 – 2020.

In *Table 9.* are represented the fitted values for the forecasting; The Point Forecast and the different confidence levels, in this case, 80 and 95.

Table 9. Fitted Values for the Total Arrivals ARIMA model

Period	Point Forecast	Level			
		85%		95%	
Jan-20	240.766	240.766	240.766	240.766	240.766
Feb-20	567.639	486.519	648.759	443.576	691.702
Mar-20	1.214.587	1.127.143	1.302.032	1.080.852	1.348.322
Apr-20	1.924.042	1.830.700	2.017.383	1.781.288	2.066.795
May-20	2.445.922	2.347.035	2.544.809	2.294.687	2.597.157
Jun-20	2.826.408	2.722.270	2.930.546	2.667.143	2.985.673
Jul-20	2.756.172	2.647.036	2.865.309	2.589.263	2.923.082
Aug-20	2.325.666	2.211.750	2.439.581	2.151.447	2.499.885
Sep-20	1.453.540	1.335.038	1.572.043	1.272.307	1.634.774
Oct-20	315.389	192.471	438.307	127.402	503.376
Nov-20	285.915	158.735	413.096	91.409	480.421
Dec-20	268.111	136.806	399.416	67.297	468.924
2020	16.624.157	15.436.269	17.812.047	14.807.437	18.440.877

Source: own elaboration

In overall and strictly according to the model, it can be extracted from these predictions that around 15 and 18,5 millions of tourists were expected to arrive to the Balearic Islands during the 2020.

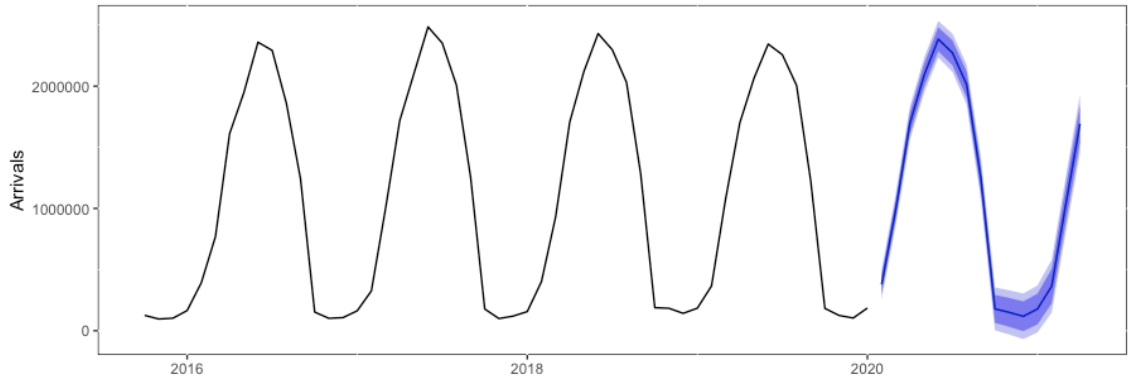
All in all, when assessing the possible results/possibilities, the 95% confidence level could be considered excessive in both, upper and lower values when comparing it with the real evolution of the data available. A similar situation happens with the 85% level, which seems to be more realistic taking closer range to the observed data but still being far from regular values. Finally, the point forecast (blue line) in *Figure 5.* have similar results as in the two past years but slightly more optimistic, this value will be used as a reference to perform the estimations.

In the following parts, it is going to be analysed the arrivals separately by International and Domestic Arrivals to the Balearic Islands.

International Arrivals

Before starting to analyse the International arrivals, it's important to highlight the importance of this market for the Balearic Islands, since almost the 85% of the tourist arrivals were from this market in the last years. This fact, will be captured in the similarity of the forecasting between international arrivals and total Arrivals, following similar a pattern and shape.

Figure 12. Counterfactual Forecast of International Arrivals to the Balearic Islands without the effect of COVID-19



Source: own elaboration

Figure 12. show how the International Arrivals should have been in absence of COVID-19. In fact, the best model found is exactly the same for the total arrivals to the Balearic Islands. The best prediction model found was an ARIMA model taking in to account the checked models *Appendix 1. Table 28*

Table 10. Best ARIMA prediction Model for International Arrivals

Model	AIC
ARIMA (0,1,1) (1,1,0) [12]	977

Source: own elaboration

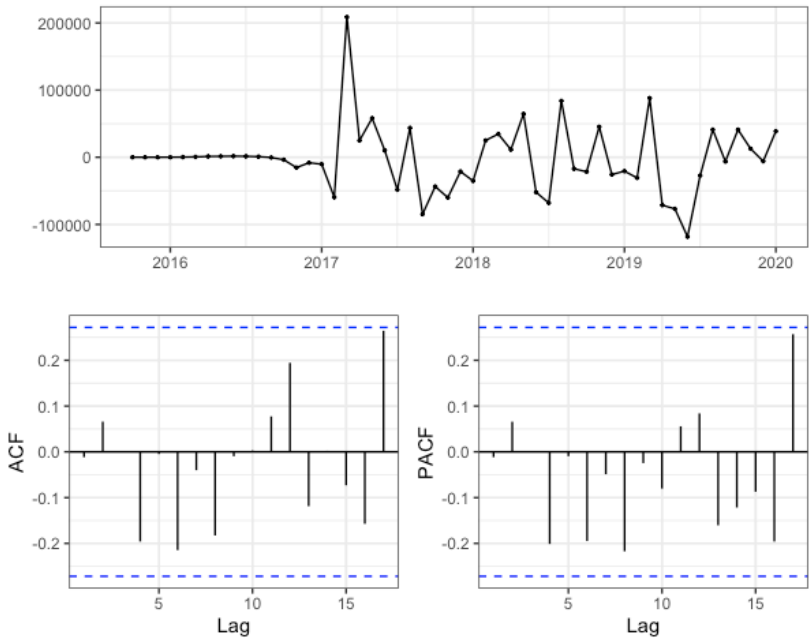
Table 11. Coefficients for the International Arrivals Forecasting Model

	ma1	sar1
	-0.5975	-0,6209
s.e	0,1541	0,1446

Source: own elaboration

This prediction has been performed with an ARIMA model with AIC = 977 and as it can be observed in *Figure 13* the series seems to be stationary and the residuals have a white noise behaviour.

Figure 13. Summary of Residuals for the International Arrivals ARIMA model.



Source: own elaboration

Table 12. Fitted Values for the International Arrivals ARIMA model

Period	Point Forecast	Level			
		Lo 80	Hi 80	Lo 95	Hi 95
Jan-20	103.772	103.772	103.772	103.772	103.772
Feb-20	378.287	301.106	455.468	260.249	496.325
Mar-20	991.016	908.303	1.073.728	864.518	1.117.514
Apr-20	1.697.861	1.609.964	1.785.758	1.563.435	1.832.288
May-20	2.089.215	1.996.423	2.182.007	1.947.302	2.231.128
Jun-20	2.384.341	2.286.899	2.481.782	2.235.317	2.533.365
Jul-20	2.272.228	2.170.348	2.374.107	2.116.417	2.428.039
Aug-20	2.013.225	1.907.093	2.119.356	1.850.911	2.175.539
Sep-20	1.250.312	1.140.092	1.360.532	1.081.746	1.418.879
Oct-20	178.507	64.345	292.669	3.911	353.102
Nov-20	150.036	32.064	268.008	-30.387	330.459
Dec-20	117.722	-3.941	239.385	-68.346	303.790
2020	13.626.521	12.516.470	14.736.573	11.928.844	15.324.198

Source: own elaboration

As commented in the last forecast, there are some expected values within the confidence intervals which are quite unrealistic when real data is taken in account.

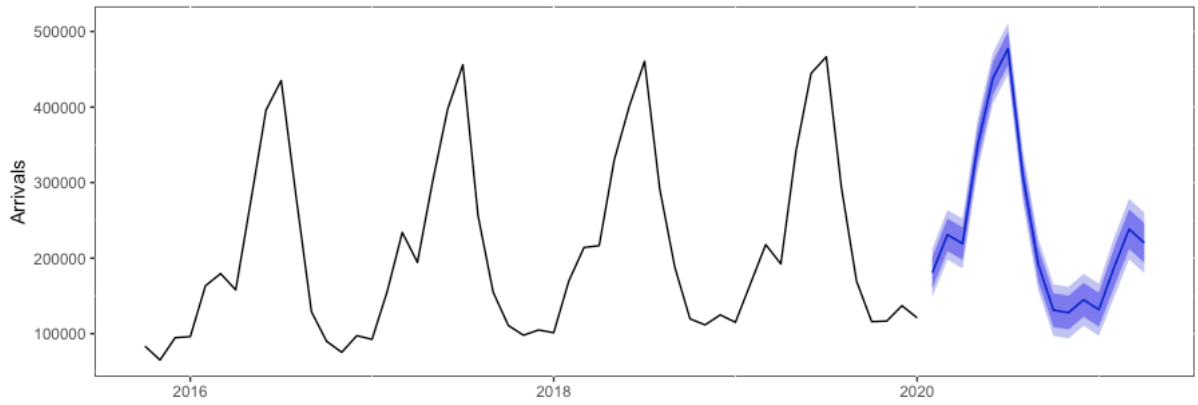
Nevertheless, according to the model, the point forecast expected a reference of (13.626.521) International Arrivals to the Balearic Islands, this is a very similar result as in the 2019 when the Balearics welcomed a total of (13.679.781) International Tourists.

As said, the Balearic Islands are considered a mature destination where the differences between regular seasons aren't much different, this is because the strong positioning and well stablished sun and sand destination in the European market.

Domestic Arrivals

When talking about Domestic Arrivals, the path was very regular during the last years with a characteristic shape corresponding to a Spanish national holiday between March and April.

Figure 14. Counterfactual Forecast of Domestic Arrivals to the Balearic Islands without the effect of COVID-19



Source: own elaboration

As it can be observed, there is a moderately positive trend in the domestic arrivals at least, form 2016, in fact, it has been captured in the forecast for the season 2020.

The following ARIMA model was the best found in the checked possibilities in *Appendix 1. Table 29*

Table 13. Best ARIMA prediction Model for Domestic Arrivals

Model	AIC
ARIMA (0,1,4) (1,1,0) [12]	879

Source: own elaboration

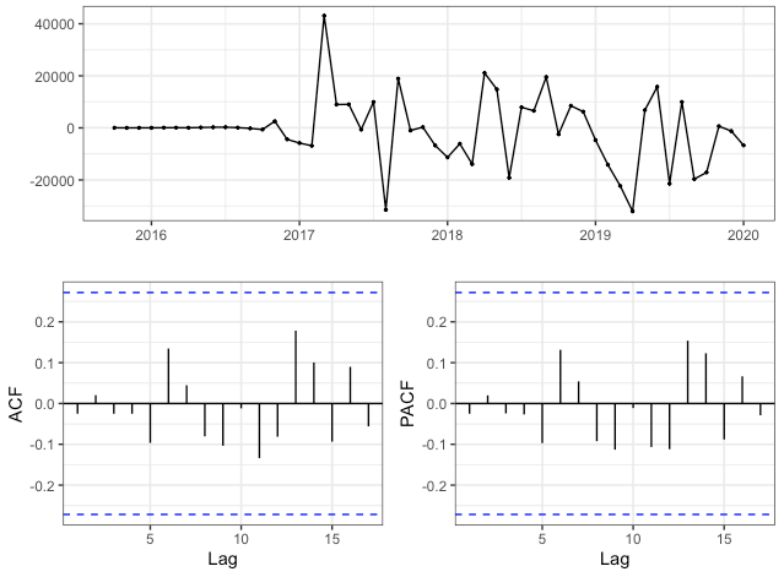
Table 14. Coefficients for the Domestic Arrivals Forecasting Model

	ma1	sar1
	-0.6147	-0.5528
s.e	0.1539	0.1657

Source: own elaboration

This prediction has been performed with an ARIMA model with AIC = 879 and as it can be observed in *Figure 15*, the series seems to be stationary and the residuals have a white noise behaviour.

Figure 15. Summary of Residuals for the Domestic Arrivals ARIMA model.



Source: own elaboration

Table 15. Fitted Values for the Domestic Arrivals ARIMA model

Period	Point Forecast	Level			
		Lo 80	Hi 80	Lo 95	Hi 95
Jan-20	136.994	136.994	136.994	136.994	136.994
Feb-20	180.453	159.659	201.246	148.652	212.254
Mar-20	230.945	209.537	252.353	198.204	263.686
Apr-20	219.310	197.867	240.753	186.516	252.104
May-20	349.843	327.873	371.812	316.243	383.442
Jun-20	438.001	415.970	460.032	404.308	471.694
Jul-20	477.288	455.196	499.379	443.502	511.074
Aug-20	306.202	284.050	328.354	272.323	340.081
Sep-20	191.581	169.368	213.794	157.609	225.552
Oct-20	131.152	108.879	153.425	97.088	165.216
Nov-20	127.883	105.550	150.217	93.728	162.039
Dec-20	144.848	122.454	167.241	110.600	179.096
2020	2.934.499	2.693.398	3.175.600	2.565.767	3.303.231

Source: own elaboration

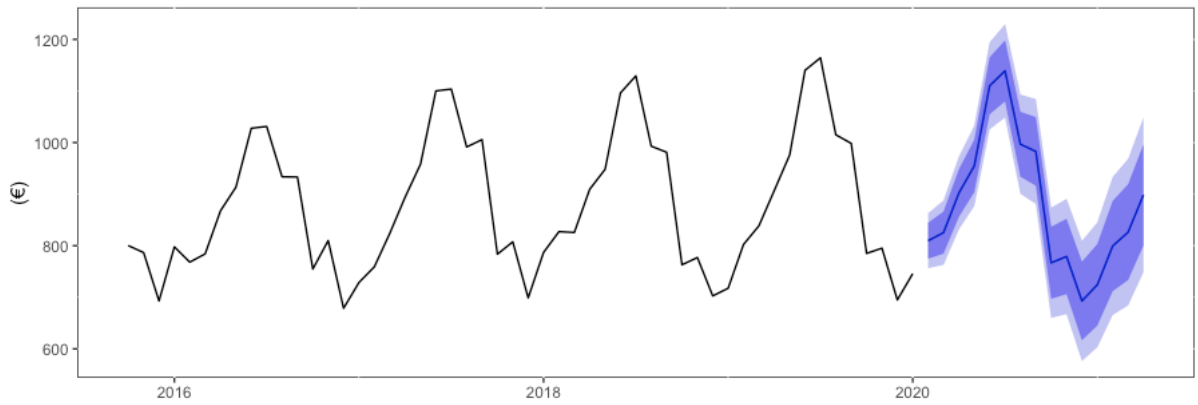
The difference of values between levels in this case doesn't seem to be as large as in the other two predictions, but still being a little bit unrealistic when taking in account the confidence intervals.

All in all, the model seems to eject a slightly optimistic forecast for the 2020 than previous years, expecting a reference with the point forecast of (2.934.499) arrivals when in 2019 the Balearics welcomed a total of (2.764.993).

Expenditure per tourist

Regarding one of the most important variables of this study together with the Arrivals, the expenditure per person in the Balearic Islands is going to be forecasted;

Figure 16. Counterfactual Forecast of Expenditure per person in the Balearic Islands without the effect of COVID-19



Source: own elaboration

As in the arrivals, the data span from November 2015 up to April 2020. In this case the series have been cut up to January 2020 in order to perform accurate forecasting without the effect of the COVID-19.

Table 16. Best ARIMA prediction Model for Expenditure per Person

Model	AIC
ARIMA (0,1,1) (1,1,0)[12]	376

Source: own elaboration

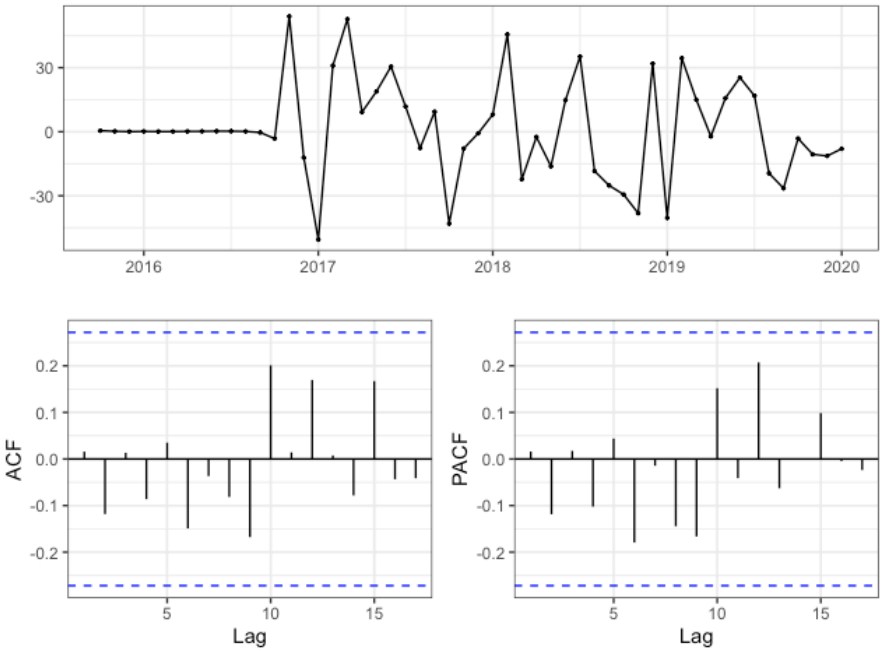
Table 17. Coefficients for the Expenditure per Person Forecasting Model

	ma1	sar1
	-0.3842	-0.5424
s.e	0.1725	0.1456

Source: own elaboration

As seen in the Expenditure per person in the general path, there is a strong seasonality and a light positive trend but it hasn't been captured in the forecasting model, in fact, according to the model, the expenditure per person is slightly below than in 2019.

Figure 17. Summary of Residuals for the Expenditure per person.



Source: own elaboration

Table 18. Fitted Values for the Expenditure per Person ARIMA model

Period	Point Forecast	Level Lo 80	Hi 80	Lo 95	Hi 95
Jan-20	694,87	694,87	694,87	694,87	694,87
Feb-20	809,59	774,82	844,37	756,41	862,78
Mar-20	825,29	784,45	866,13	762,83	887,75
Apr-20	902,06	855,95	948,17	831,53	972,58
May-20	954,61	903,77	1005,46	876,86	1032,37
Jun-20	1110,05	1054,88	1165,22	1025,68	1194,42
Jul-20	1139,04	1079,86	1198,22	1048,53	1229,55
Aug-20	996,85	933,91	1059,78	900,60	1093,09
Sep-20	982,80	916,32	1049,27	881,13	1084,47
Oct-20	766,84	697,00	836,68	660,03	873,65
Nov-20	779,09	706,04	852,14	667,37	890,81
Dec-20	692,83	616,70	768,95	576,41	809,25

Source: own elaboration

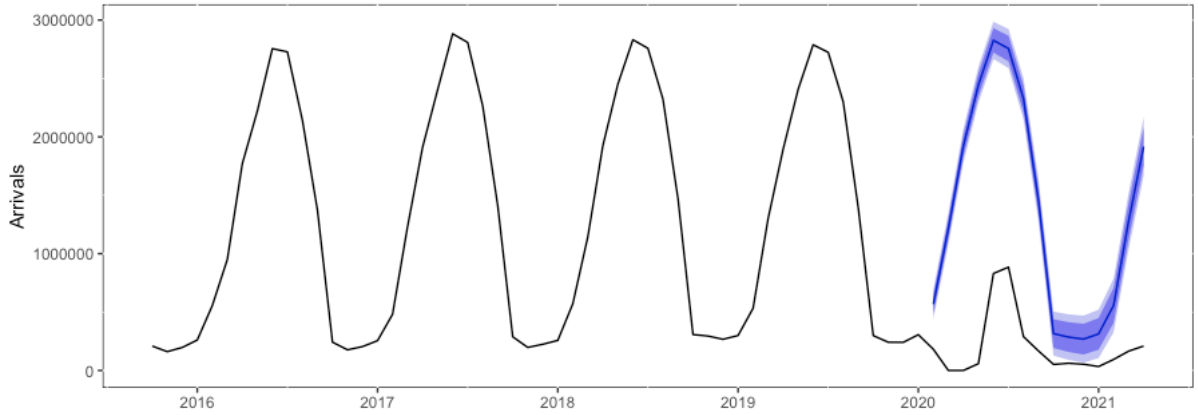
If we look strictly to the model, the bans are not as unappropriated as in other seen forecasting, but taking in account how the model was robustly constructed and the similarity of the predicted values to past data, they seem to be reliable.

According to the model, the expenditure per person during 2020 would have had slightly lower monthly values than in 2019 but at the end, seem to be very similar.

4. RESULTS

In this part, the results are going to be presented comparing the counterfactual constructed scenario and the real evolution path of the data, firstly with total arrivals. In *Figure 18*. it has been displayed two different scenarios; on the one hand the real time series data including the COVID-19 outbreak and the corresponding predictions, starting in February 2020 and finishing by April 2021.

Figure 18. Total arrivals counterfactual and real path of total arrivals to the Balearic Islands



Source: own elaboration

Table 19. Total Arrivals by year differentiated between counterfactual and Real figures

Year	Total Arrivals	Counterfactual
2016	15.369.927	15.369.927
2017	16.341.033	16.341.033
2018	16.561.348	16.561.348
2019	16.444.775	16.444.775
2020	3.071.905	16.624.162

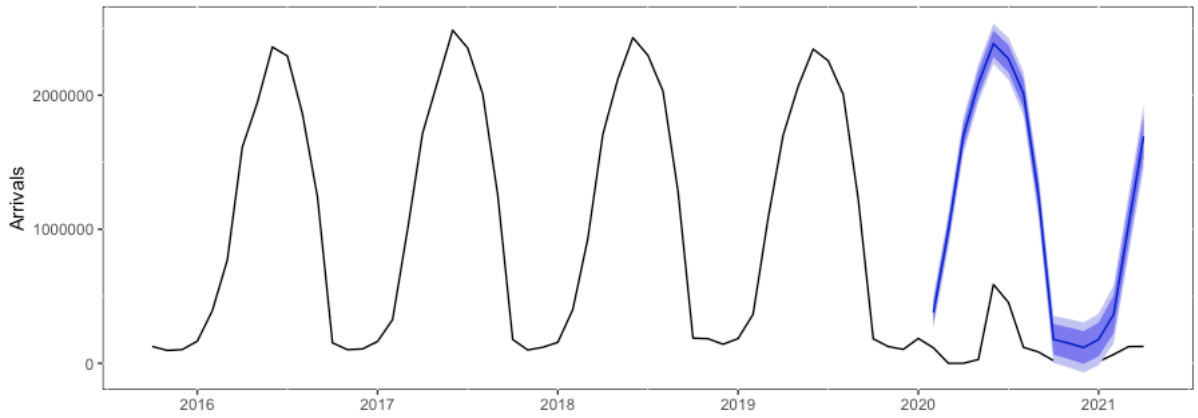
Source: own elaboration

As seen in *Table 19* according to the model, it can be observed how approximately a total of (16.624.162) tourists were expected to visit the Balearic Islands during the 2020. What happened in reality, and because of the COVID-19 outbreak the real figures of total arrivals were (3.071.905) in the whole 2020. So the Impact of the COVID-19 outbreak, reduced the total arrivals to the Balearic Islands by (13.552.257) and in percentage terms 82%. It is going to be analysed how was the impact in both cases International and Domestic.

International Arrivals

Regarding International Arrivals, the shape is quite similar than the Total Arrivals (as said) because of the importance of International Tourism. Despite this fact, this was the most affected aspect in the Balearic Islands.

Table 20. International Arrivals Counterfactual and real path of total arrivals to the Balearic Islands



Source: own elaboration

Table 21. International Arrivals by year differentiated between counterfactual and Real figures

Year	International Arrivals	Counterfactual
2016	12.997.549	12.997.549
2017	13.792.296	13.792.296
2018	13.851.598	13.851.598
2019	13.679.781	13.679.781
2020	1.721.320	13.626.521

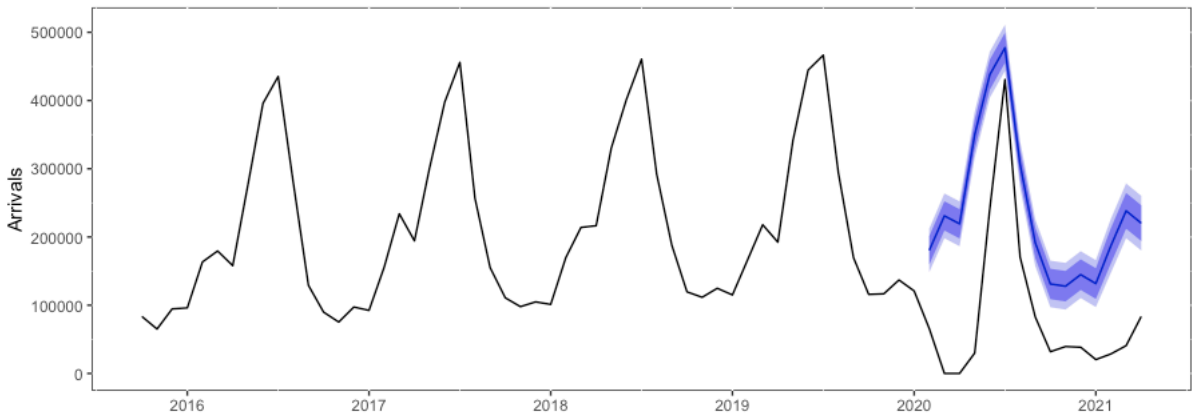
Source: own elaboration

According to the model, it can be observed how approximately a total of (13.626.521) International tourists were expected to visit the Balearic Islands during the 2020. What happened in reality, and because of the COVID-19 outbreak the real figures of total arrivals were (1.721.320). So the Impact of the COVID-19 outbreak reduced the International Arrivals to the Balearic Islands by (11.905.201) and in percentage terms 87,37%.

Domestic Arrivals

Regarding the Domestic Arrivals, the 2020 season was less affected than the International, or at least, not as dramatic as in the International Market. As said, once the outbreak was considered, many travel restrictions were put in place worldwide, and they were progressively being removed, so one of the easiest ways to go on holiday was to travel domestically.

Table 22. Domestic Arrivals Counterfactual vs Reality of Total Arrivals to the Balearic Islands



Source: own elaboration

Table 23. Domestic Arrivals by year differentiated between counterfactual and Real figures

Year	Domestic Arrivals	Counterfactual
2016	2.372.379	2.372.379
2017	2.548.736	2.548.736
2018	2.709.750	2.709.750
2019	2.764.993	2.764.993
2020	1.350.587	2.934.499

Source: own elaboration

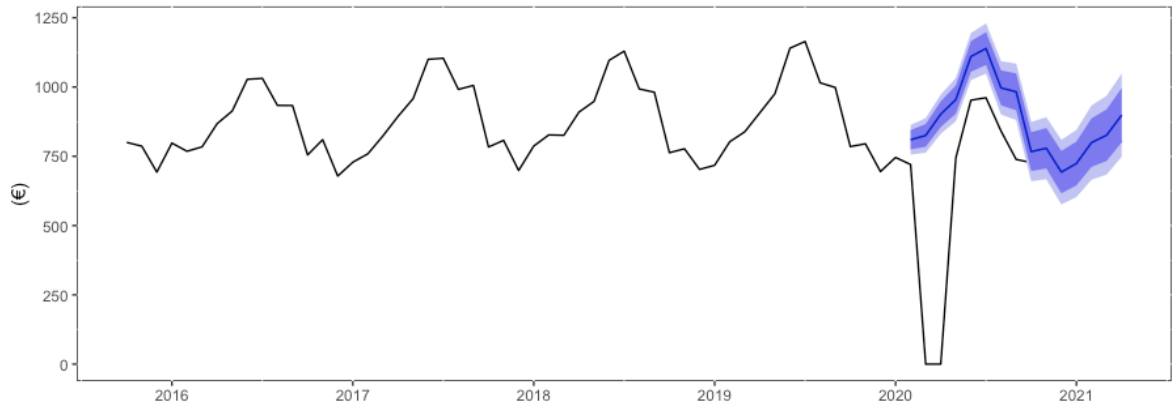
According to the model, the expected domestic arrivals were near 3 millions (2.934.499) when in reality, the total arrivals were (1.350.587). It is a decrease of (1.583.912) or in percentage, a drop of 54% from the counterfactual scenario to the real path.

Obviously, the season was dramatic, but the evolution to the recuperation was considerably good immediately when the possibility to travel was allowed.

Regarding the Expenditure per Person

It's right that there was a drop to cero in the expenditure per person during two months, but the recovery was extremely rapid and it suddenly aligned to the forecasted model.

Figure 19. Expenditure per Tourist Counterfactual vs Reality of Total Arrivals to the Balearic Islands



Source: own elaboration

Table 24. Expenditure per Tourist by year differentiated between counterfactual and Real figures

Period	Expenditure per Person	Counterfactual
Jan-20	694,87	694,87
Feb-20	745,8	809,59
Mar-20	720,29	825,29
Apr-20	0	902,06
May-20	0	954,61
Jun-20	744,53	1.110,05
Jul-20	952,39	1.139,04
Aug-20	961,33	996,85
Sep-20	840,73	982,8
Oct-20	738,79	766,84
Nov-20	727,22	779,09
Dec-20	674,7	692,83

Source: own elaboration

It's right that the arrivals considerably dropped during the COVID-19 outbreak and they are in the path to the recuperation. Nevertheless, the expenditure follows the same evolution path as in the past although a pandemic outbreak occurred. Seems that the Expenditure per person during the months immediately after the pandemic were recovered in a relatively short time. The forecast shows how the model expected slightly less expenditure per person in 2020. The difference in average also changed from the expectations for 2020 to the 2019 levels (last regular season).

As a proxy for the total expenditure, it can be considered the expected arrivals and the expected expenditure per person to realize how was the impact through the loss of total expenditure.

Note that in terms of arrivals the prediction models were slightly optimistic than in other years. Regarding the evolution of expenditure per person, despite the positive trend, it was expected to have approximated values but slightly below 2019. The proxy to calculate the total expenditure has been made using the two predictions made in *section 2*; on the one hand, the forecasted expenditure per person and in the other hand, the forecasted total arrivals to the Balearic Islands.

Table 25. Proxy for total Expenditure

Period	Forecasted Expenditure	Forecasted Arrivals	Total Expenditure
Jan-20	694,87	240.766	167.301.070
Feb-20	809,59	567.639	459.556.001
Mar-20	825,29	1.214.588	1.002.383.020
Apr-20	902,06	1.924.042	1.735.598.527
May-20	954,61	2.445.923	2.334.909.323
Jun-20	1.110,05	2.826.408	3.137.460.901
Jul-20	1.139,04	2.756.173	3.139.389.695
Aug-20	996,85	2.325.666	2.318.329.741
Sep-20	982,80	1.453.541	1.428.536.693
Oct-20	766,84	315.389	241.852.442
Nov-20	779,09	285.916	222.754.237
Dec-20	692,83	268.111	185.754.940
			16.373.826.592

Source: own elaboration

According to the Expectations of Arrivals and Expenditure, the result was (16.373.826.592) of Total Expenditure in (€). This total expenditure is very similar to the analysed data in section 1.

Table 26. Total Expenditure by year including the proxy for 2020

Year	Total Expenditure	Total Expenditure Counterfactual
2016	14.194	14.194
2017	16.037	16.037
2018	16.285	16.285
2019	16.489	16.489
2020	2.657	16.373

Source: own elaboration

In fact, according to the proxy and the past data on total expenditure, the season 2020 was expected to be between 2018 and 2019. Despite the arrivals are more than in 2019, the expenditure per person expected was slightly lower, so the final estimation of total Expenditure is slightly less than in 2019. But following logic values of Total Expenditure.

So the impact in total expenditure was (13.716) in millions (€) which represents, in percentage terms, a drop of 84% in total expenditure of Tourists with main destination the Balearic Islands

Finally, it's important to comment on the consequences of this mobility problem for the tourism industry caused an increase of the unemployment rate to similar levels of nine years ago with peaks of more than 80.000 unemployed people. And obviously, a repercussion on the GDP never seen with a variation of more than (- 23%) from 2019 to 2020.

5. CONCLUSION

I. A Counterfactual analysis has been performed in this report pretending the COVID-19 outbreak never took place in order to measure the impact of the pandemic on the Economics of Tourism in the Balearic Islands down the hypothesis that the impact could be measured comparing the difference between the forecasted counterfactual scenario and the real evolution of the data.

II. The report has been performed in three steps carried out correlatively:

   i. Analyse the real evolution of the data including the effects of the pandemic, it is how was the behaviour of the tourism sector in reality.

   ii. Construct and present robust counterfactual forecasts pretending the pandemic never occurred in the Balearic Islands.

   iii. Measuring the gap between what have happened in reality (i) and the counterfactual scenario results (ii).

III. As seen, this pandemic caused dramatic consequences worldwide specially in the tourism sector, where the mobility is a key factor of this economic activity, (it is to travel from origin to destination). Once this mobility is restricted in this abruptly way, all the tourism sector is in danger. For this reason and taking it into account, the arrivals have been one of the most important variables in this report, since seems obvious that with any kind of mobility restriction, the sector will be in a dangerous position.

IV. Once has been analysed the gap between the counterfactual forecasts and the real data available, the following results have been reached:

   i. Regarding the 2020 arrivals, it has been observed a drop of 82% in total arrivals respect to the counterfactual forecasts. Specifically, a drop of 87% on the international arrivals and a drop of 54% on the domestic arrivals.

   ii. A drop of 84% on the total expenditure of 2020 respect to the counterfactual forecasts for the same year, this is a loss of production of 13.716 millions of euros.

   iii. Reaching similar unemployment rates from nine years ago in the Balearic Islands with a peak of more than 80.000 registered unemployed in early 2021.

   iv. An extraordinary negative variation of more than 23% on the GDP of the Balearic Islands respect to the 2019.

V. It's important to point out that the Total Expenditure does not completely belong to the Balearic Islands, since the data has been extracted from a survey performed by EGATUR and formed different categories of expenditure including all the expenditure in the origin and destination related with the trip.

VI. Despite it has been one of the most difficult situations the tourism sector of the Balearic Islands has passed through, it is necessary to highlight the resilient behaviour of the Expenditure per person which have been rapidly aligned to the regular pre pandemic levels, so the problem nowadays is basically of arrivals.

VII. Since the Balearics are a mature destination, the results are not significantly different form other years, so probably, this technique would better fit in developing destinations where capturing the trend is more important and the loss of income is not that predictable.

APPENDIX

Table 27. Checked ARIMA models for Total Arrivals

Model	AIC
ARIMA(0,1,0)(0,1,0)[12]	: 1005.828
ARIMA(0,1,0)(0,1,1)[12]	: 1000.819
ARIMA(0,1,0)(1,1,0)[12]	: 992.2988
ARIMA(0,1,0)(1,1,1)[12]	: Inf
ARIMA(0,1,1)(0,1,0)[12]	: 991.4196
ARIMA(0,1,1)(0,1,1)[12]	: 987.6608
ARIMA(0,1,1)(1,1,0)[12]	: 983.9276
ARIMA(0,1,1)(1,1,1)[12]	: Inf
ARIMA(0,1,2)(0,1,0)[12]	: 993.6406
ARIMA(0,1,2)(0,1,1)[12]	: 990.1495
ARIMA(0,1,2)(1,1,0)[12]	: 986.3725
ARIMA(0,1,2)(1,1,1)[12]	: Inf
ARIMA(0,1,3)(0,1,0)[12]	: 995.4194
ARIMA(0,1,3)(0,1,1)[12]	: 992.1819
ARIMA(0,1,3)(1,1,0)[12]	: 988.5651
ARIMA(0,1,3)(1,1,1)[12]	: Inf
ARIMA(0,1,4)(0,1,0)[12]	: 996.8678
ARIMA(0,1,4)(0,1,1)[12]	: 994.6752
ARIMA(0,1,4)(1,1,0)[12]	: 990.5319
ARIMA(0,1,5)(0,1,0)[12]	: 999.1422
ARIMA(1,1,0)(0,1,0)[12]	: 994.9799
ARIMA(1,1,0)(0,1,1)[12]	: 991.5016
ARIMA(1,1,0)(1,1,0)[12]	: 986.7612
ARIMA(1,1,0)(1,1,1)[12]	: Inf
ARIMA(1,1,1)(0,1,0)[12]	: 993.5716
ARIMA(1,1,1)(0,1,1)[12]	: 990.1481
ARIMA(1,1,1)(1,1,0)[12]	: 986.3348
ARIMA(1,1,1)(1,1,1)[12]	: Inf
ARIMA(1,1,2)(0,1,0)[12]	: 996.0347
ARIMA(1,1,2)(0,1,1)[12]	: 992.7437
ARIMA(1,1,2)(1,1,0)[12]	: 988.5766
ARIMA(1,1,2)(1,1,1)[12]	: Inf
ARIMA(1,1,3)(0,1,0)[12]	: 996.5989
ARIMA(1,1,3)(0,1,1)[12]	: 994.559
ARIMA(1,1,3)(1,1,0)[12]	: 991.3743
ARIMA(1,1,4)(0,1,0)[12]	: 999.1658
ARIMA(2,1,0)(0,1,0)[12]	: 994.288

ARIMA(2,1,0)(0,1,1)[12]	: 991.6151
ARIMA(2,1,0)(1,1,0)[12]	: 987.3475
ARIMA(2,1,0)(1,1,1)[12]	: Inf
ARIMA(2,1,1)(0,1,0)[12]	: 994.74
ARIMA(2,1,1)(0,1,1)[12]	: 991.9603
ARIMA(2,1,1)(1,1,0)[12]	: 988.1132
ARIMA(2,1,1)(1,1,1)[12]	: Inf
ARIMA(2,1,2)(0,1,0)[12]	: Inf
ARIMA(2,1,2)(0,1,1)[12]	: 994.5928
ARIMA(2,1,2)(1,1,0)[12]	: Inf
ARIMA(2,1,3)(0,1,0)[12]	: Inf
ARIMA(3,1,0)(0,1,0)[12]	: 996.2655
ARIMA(3,1,0)(0,1,1)[12]	: 993.8104
ARIMA(3,1,0)(1,1,0)[12]	: 989.9008
ARIMA(3,1,0)(1,1,1)[12]	: Inf
ARIMA(3,1,1)(0,1,0)[12]	: 996.7482
ARIMA(3,1,1)(0,1,1)[12]	: 994.5442
ARIMA(3,1,1)(1,1,0)[12]	: 992.2186
ARIMA(3,1,2)(0,1,0)[12]	: 999.5507
ARIMA(4,1,0)(0,1,0)[12]	: 998.884
ARIMA(4,1,0)(0,1,1)[12]	: 995.6462
ARIMA(4,1,0)(1,1,0)[12]	: 991.183
ARIMA(4,1,1)(0,1,0)[12]	: 999.6249
ARIMA(5,1,0)(0,1,0)[12]	: 1001.686

Table 28. Checked ARIMA models for International Arrivals

Model	AIC
ARIMA(0,1,0)(0,1,0)[12]	: 996.8269
ARIMA(0,1,0)(0,1,1)[12]	: 994.1561
ARIMA(0,1,0)(1,1,0)[12]	: 988.3248
ARIMA(0,1,0)(1,1,1)[12]	: Inf
ARIMA(0,1,1)(0,1,0)[12]	: 983.2271
ARIMA(0,1,1)(0,1,1)[12]	: 981.3135
ARIMA(0,1,1)(1,1,0)[12]	: 978.6114
ARIMA(0,1,1)(1,1,1)[12]	: Inf
ARIMA(0,1,2)(0,1,0)[12]	: 985.4286
ARIMA(0,1,2)(0,1,1)[12]	: 983.7953
ARIMA(0,1,2)(1,1,0)[12]	: 981.1021
ARIMA(0,1,2)(1,1,1)[12]	: Inf

ARIMA(0,1,3)(0,1,0)[12]	: 986.7504
ARIMA(0,1,3)(0,1,1)[12]	: 985.4071
ARIMA(0,1,3)(1,1,0)[12]	: 982.7788
ARIMA(0,1,3)(1,1,1)[12]	: Inf
ARIMA(0,1,4)(0,1,0)[12]	: 988.815
ARIMA(0,1,4)(0,1,1)[12]	: 987.9518
ARIMA(0,1,4)(1,1,0)[12]	: 984.7698
ARIMA(0,1,5)(0,1,0)[12]	: 991.3143
ARIMA(1,1,0)(0,1,0)[12]	: 985.7725
ARIMA(1,1,0)(0,1,1)[12]	: 984.3691
ARIMA(1,1,0)(1,1,0)[12]	: 981.0141
ARIMA(1,1,0)(1,1,1)[12]	: Inf
ARIMA(1,1,1)(0,1,0)[12]	: 985.3158
ARIMA(1,1,1)(0,1,1)[12]	: 983.7853
ARIMA(1,1,1)(1,1,0)[12]	: 981.1019
ARIMA(1,1,1)(1,1,1)[12]	: Inf
ARIMA(1,1,2)(0,1,0)[12]	: 987.7327
ARIMA(1,1,2)(0,1,1)[12]	: 986.3467
ARIMA(1,1,2)(1,1,0)[12]	: Inf
ARIMA(1,1,2)(1,1,1)[12]	: Inf
ARIMA(1,1,3)(0,1,0)[12]	: 988.2886
ARIMA(1,1,3)(0,1,1)[12]	: 987.8132
ARIMA(1,1,3)(1,1,0)[12]	: 985.0107
ARIMA(1,1,4)(0,1,0)[12]	: Inf
ARIMA(2,1,0)(0,1,0)[12]	: 986.0029
ARIMA(2,1,0)(0,1,1)[12]	: 984.874
ARIMA(2,1,0)(1,1,0)[12]	: 981.7198
ARIMA(2,1,0)(1,1,1)[12]	: Inf
ARIMA(2,1,1)(0,1,0)[12]	: 986.0362
ARIMA(2,1,1)(0,1,1)[12]	: 985.1641
ARIMA(2,1,1)(1,1,0)[12]	: 982.447
ARIMA(2,1,1)(1,1,1)[12]	: Inf
ARIMA(2,1,2)(0,1,0)[12]	: 988.4398
ARIMA(2,1,2)(0,1,1)[12]	: 987.8398
ARIMA(2,1,2)(1,1,0)[12]	: 985.1255
ARIMA(2,1,3)(0,1,0)[12]	: Inf
ARIMA(3,1,0)(0,1,0)[12]	: 988.1832
ARIMA(3,1,0)(0,1,1)[12]	: 987.2951
ARIMA(3,1,0)(1,1,0)[12]	: 984.3576
ARIMA(3,1,0)(1,1,1)[12]	: Inf
ARIMA(3,1,1)(0,1,0)[12]	: 988.3695
ARIMA(3,1,1)(0,1,1)[12]	: 987.7848

ARIMA(3,1,1)(1,1,0)[12]	: 985.0078
ARIMA(3,1,2)(0,1,0)[12]	: Inf
ARIMA(4,1,0)(0,1,0)[12]	: 990.4661
ARIMA(4,1,0)(0,1,1)[12]	: 988.6035
ARIMA(4,1,0)(1,1,0)[12]	: 985.1586
ARIMA(4,1,1)(0,1,0)[12]	: Inf
ARIMA(5,1,0)(0,1,0)[12]	: 993.2572

Table 29. Checked ARIMA models for Domestic Arrivals

Model	AIC
ARIMA(0,1,0)(0,1,0)[12]	: 896.4987
ARIMA(0,1,0)(0,1,1)[12]	: Inf
ARIMA(0,1,0)(1,1,0)[12]	: 892.0437
ARIMA(0,1,0)(1,1,1)[12]	: Inf
ARIMA(0,1,1)(0,1,0)[12]	: Inf
ARIMA(0,1,1)(0,1,1)[12]	: Inf
ARIMA(0,1,1)(1,1,0)[12]	: Inf
ARIMA(0,1,1)(1,1,1)[12]	: Inf
ARIMA(0,1,2)(0,1,0)[12]	: Inf
ARIMA(0,1,2)(0,1,1)[12]	: Inf
ARIMA(0,1,2)(1,1,0)[12]	: Inf
ARIMA(0,1,2)(1,1,1)[12]	: Inf
ARIMA(0,1,3)(0,1,0)[12]	: Inf
ARIMA(0,1,3)(0,1,1)[12]	: Inf
ARIMA(0,1,3)(1,1,0)[12]	: Inf
ARIMA(0,1,3)(1,1,1)[12]	: Inf
ARIMA(0,1,4)(0,1,0)[12]	: 884.1789
ARIMA(0,1,4)(0,1,1)[12]	: Inf
ARIMA(0,1,4)(1,1,0)[12]	: 881.7272
ARIMA(0,1,5)(0,1,0)[12]	: 886.8004
ARIMA(1,1,0)(0,1,0)[12]	: 893.5326
ARIMA(1,1,0)(0,1,1)[12]	: Inf
ARIMA(1,1,0)(1,1,0)[12]	: 890.4559
ARIMA(1,1,0)(1,1,1)[12]	: Inf
ARIMA(1,1,1)(0,1,0)[12]	: Inf
ARIMA(1,1,1)(0,1,1)[12]	: Inf
ARIMA(1,1,1)(1,1,0)[12]	: Inf
ARIMA(1,1,1)(1,1,1)[12]	: Inf
ARIMA(1,1,2)(0,1,0)[12]	: Inf
ARIMA(1,1,2)(0,1,1)[12]	: Inf

ARIMA(1,1,2)(1,1,0)[12]	: Inf
ARIMA(1,1,2)(1,1,1)[12]	: Inf
ARIMA(1,1,3)(0,1,0)[12]	: 885.1806
ARIMA(1,1,3)(0,1,1)[12]	: Inf
ARIMA(1,1,3)(1,1,0)[12]	: Inf
ARIMA(1,1,4)(0,1,0)[12]	: 886.6988
ARIMA(2,1,0)(0,1,0)[12]	: 892.7265
ARIMA(2,1,0)(0,1,1)[12]	: Inf
ARIMA(2,1,0)(1,1,0)[12]	: 891.3768
ARIMA(2,1,0)(1,1,1)[12]	: Inf
ARIMA(2,1,1)(0,1,0)[12]	: Inf
ARIMA(2,1,1)(0,1,1)[12]	: Inf
ARIMA(2,1,1)(1,1,0)[12]	: Inf
ARIMA(2,1,1)(1,1,1)[12]	: Inf
ARIMA(2,1,2)(0,1,0)[12]	: 884.8262
ARIMA(2,1,2)(0,1,1)[12]	: Inf
ARIMA(2,1,2)(1,1,0)[12]	: Inf
ARIMA(2,1,3)(0,1,0)[12]	: Inf
ARIMA(3,1,0)(0,1,0)[12]	: 890.6192
ARIMA(3,1,0)(0,1,1)[12]	: Inf
ARIMA(3,1,0)(1,1,0)[12]	: 888.2013
ARIMA(3,1,0)(1,1,1)[12]	: Inf
ARIMA(3,1,1)(0,1,0)[12]	: 885.0806
ARIMA(3,1,1)(0,1,1)[12]	: Inf
ARIMA(3,1,1)(1,1,0)[12]	: 882.0975
ARIMA(3,1,2)(0,1,0)[12]	: 887.6987
ARIMA(4,1,0)(0,1,0)[12]	: 892.4371
ARIMA(4,1,0)(0,1,1)[12]	: Inf
ARIMA(4,1,0)(1,1,0)[12]	: 889.5152
ARIMA(4,1,1)(0,1,0)[12]	: 887.8716
ARIMA(5,1,0)(0,1,0)[12]	: 889.4091

Table 30. Checked ARIMA models for Tourist Expenditure

Model	AIC
ARIMA(0,1,0)(0,1,0)[12]	: 385.8779
ARIMA(0,1,0)(0,1,1)[12]	: 381.6615
ARIMA(0,1,0)(1,1,0)[12]	: 378.6351
ARIMA(0,1,0)(1,1,1)[12]	: 379.846
ARIMA(0,1,1)(0,1,0)[12]	: 383.9189
ARIMA(0,1,1)(0,1,1)[12]	: 380.6063
ARIMA(0,1,1)(1,1,0)[12]	: 377.0998

ARIMA(0,1,1)(1,1,1)[12]	: Inf
ARIMA(0,1,2)(0,1,0)[12]	: 383.6562
ARIMA(0,1,2)(0,1,1)[12]	: 381.4299
ARIMA(0,1,2)(1,1,0)[12]	: 378.6589
ARIMA(0,1,2)(1,1,1)[12]	: Inf
ARIMA(0,1,3)(0,1,0)[12]	: 384.9847
ARIMA(0,1,3)(0,1,1)[12]	: 383.3896
ARIMA(0,1,3)(1,1,0)[12]	: 381.0314
ARIMA(0,1,3)(1,1,1)[12]	: Inf
ARIMA(0,1,4)(0,1,0)[12]	: 387.6258
ARIMA(0,1,4)(0,1,1)[12]	: 385.9059
ARIMA(0,1,4)(1,1,0)[12]	: Inf
ARIMA(0,1,5)(0,1,0)[12]	: Inf
ARIMA(1,1,0)(0,1,0)[12]	: 386.4842
ARIMA(1,1,0)(0,1,1)[12]	: 382.2404
ARIMA(1,1,0)(1,1,0)[12]	: 378.5979
ARIMA(1,1,0)(1,1,1)[12]	: 379.4921
ARIMA(1,1,1)(0,1,0)[12]	: 385.2906
ARIMA(1,1,1)(0,1,1)[12]	: Inf
ARIMA(1,1,1)(1,1,0)[12]	: Inf
ARIMA(1,1,1)(1,1,1)[12]	: Inf
ARIMA(1,1,2)(0,1,0)[12]	: 385.332
ARIMA(1,1,2)(0,1,1)[12]	: 383.3817
ARIMA(1,1,2)(1,1,0)[12]	: 380.824
ARIMA(1,1,2)(1,1,1)[12]	: Inf
ARIMA(1,1,3)(0,1,0)[12]	: 387.6262
ARIMA(1,1,3)(0,1,1)[12]	: 386.1057
ARIMA(1,1,3)(1,1,0)[12]	: 383.6267
ARIMA(1,1,4)(0,1,0)[12]	: 390.1306
ARIMA(2,1,0)(0,1,0)[12]	: 382.2509
ARIMA(2,1,0)(0,1,1)[12]	: 380.773
ARIMA(2,1,0)(1,1,0)[12]	: 378.5486
ARIMA(2,1,0)(1,1,1)[12]	: 379.3429
ARIMA(2,1,1)(0,1,0)[12]	: 384.7148
ARIMA(2,1,1)(0,1,1)[12]	: 383.3872
ARIMA(2,1,1)(1,1,0)[12]	: Inf
ARIMA(2,1,1)(1,1,1)[12]	: Inf
ARIMA(2,1,2)(0,1,0)[12]	: 387.3052
ARIMA(2,1,2)(0,1,1)[12]	: 386.0363
ARIMA(2,1,2)(1,1,0)[12]	: Inf
ARIMA(2,1,3)(0,1,0)[12]	: 390.1089
ARIMA(3,1,0)(0,1,0)[12]	: 384.7182

ARIMA(3,1,0)(0,1,1)[12]	: 383.3926
ARIMA(3,1,0)(1,1,0)[12]	: 381.1857
ARIMA(3,1,0)(1,1,1)[12]	: Inf
ARIMA(3,1,1)(0,1,0)[12]	: 387.2974
ARIMA(3,1,1)(0,1,1)[12]	: 386.0797
ARIMA(3,1,1)(1,1,0)[12]	: Inf
ARIMA(3,1,2)(0,1,0)[12]	: Inf
ARIMA(4,1,0)(0,1,0)[12]	: 387.3351
ARIMA(4,1,0)(0,1,1)[12]	: 386.1619
ARIMA(4,1,0)(1,1,0)[12]	: 383.8484
ARIMA(4,1,1)(0,1,0)[12]	: Inf
ARIMA(5,1,0)(0,1,0)[12]	: 390.1403

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