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AN ANALYSIS OF THE DYNAMICS OF CRUISE TRAFFIC IN THE PORT OF DUBROVNIK

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Abstract

An extremely large number of passengers, sail to the port of Dubrovnik during the summer months, which is a big problem for both residents and tourists. Besides positive and negative effects incurred by cruise tourism on the natural and social environment, economic effect incurs as well and is shown as an increase of different types of consumption in homeports as well as in ports of call. Because of that, it is necessary to analyse passenger traffic in port and to find a solution to the congestion of the port and the city and to make possible precisely planning and organizing business and life in Dubrovnik. This paper presents an analysis of the dynamics of cruise passenger traffic in the port of Dubrovnik in the period 2004-2018.

Keywords: port of Dubrovnik, cruise passenger trend, analysis of passenger traffic

1. INTRODUCTION

Cruise tourism is the most dynamic part of the tourism economy. Despite the fastest growing market of cruise tourism, this sector is forced to continuous innovations in order to stay competitive. Innovative approach requires new port destinations, new concepts of cruise ships services and entertainments, out of ship activities, new thematic products.

From 2004 to 2014, the world demand for cruises increased from 13.1 million to 22.0 million +68%, while in Europe it has grown from 2.80 million to 6.39 million passengers, an increase of +129% (CLIA, 2015). Between 2009 and 2019, the number of cruise tourists worldwide rose significantly from 17.8 million passengers in 2009 to an expected 30 million in 2019 and the world demand for cruises increased to 28.5 million passenger (CLIA, 2017).

There are three major factors driving the global growth in cruise tourism¹:

¹ <https://www.businesswire.com/news/home/20181227005097/en/>

- A strong economic recovery, causing an increase in consumer spending and a gradual increase in luxury lifestyle and leisure travel expenses.
- A substantial increase in repositioning cruises, which refers to moving a ship from one sailing destination to another. According to Technavio, consumer interest in repositioning cruises includes exploring different destinations and their price advantage when compared with regular cruising. Cheap one-way flights for travellers to return to their homes or reach the ships in the first place are also an attractive factor.
- The growth of cruise ship capacity. According to the 2018 Cruise Industry News Annual Report², ocean cruise ship capacity will increase by 48% from 2018 to 2027, from 26.7 million to 39.6 million passengers.

Dynamic growth of cruising tourism in the Mediterranean, which achieves above-average results, certainly does feeling in the Croatian part of the Adriatic, and especially in Dubrovnik and Korcula (Ban et al., 2014).

This paper presents an analysis of the dynamics of cruise passengers traffic in the port of Dubrovnik in period from 2004. to 2018.

The results of the analysis show variations in the total number of cruise passengers, with a slight downward trend in the total number of passengers in recent years. Because of this, it is difficult to determine the future movements of the total number of cruise passengers. According to the results of the monthly traffic analysis, it is evident that the port of Dubrovnik has extended its season. Nevertheless, steps can be taken in the pre and postseason to stop the negative trend of total number of passengers and to solve problem of congestion.

The study relied heavily on secondary data obtained from the Croatian National Bureau of Statistics (www.dzs.hr) and from the Port of Dubrovnik (<http://portofdubrovnik.hr>). All the necessary data was collected for the period from 2004 to 2018. The analysis includes total passenger traffic in port of Dubrovnik and number of cruise passengers.

2. PORT OF DUBROVNIK

Dubrovnik is one of the most prominent destinations for cruises in the Mediterranean, the port of Dubrovnik stands out as a passenger port, where cruise ships are most often used, with constant growth in passenger traffic.

The port of Dubrovnik is one of the most perspective Croatian port. By constantly working and introducing new content, it has great potential to become one of Europe's leading cruise ports. This is supported by the increasing number of travelers visiting Dubrovnik through the round trip form. The port of Dubrovnik is already the port of call for many cruise companies, and with further development it will become suitable for the port of departure.

This is supported by the fact that in 2015 it became the port of embarkation and disembarkation of passengers, that is, the departure port of the passenger ship "Thomson Celebration".

It is very important for Dubrovnik to proactively pursuing a fruitful collaboration with industry and tourism operators, both local and global, proposing new activities that valorize territorial quality and involve local entrepreneurs. The city of Naples offers a good example of a strategic collaboration between the Municipality, the local Chamber of Commerce and an important cruise line (MSC): in a joint operation named *Enjoy Naples*, the city and the cruise lines presented a tourism agreed packaged to stimulate the pre- and post-cruise stays in the city: *ad hoc* packages have been set up, involving also the local theatre San Carlo and the urban network of

² <https://www.cruiseindustrynews.com/store/product/annual-reports/2018-2019-annual-report/>

museums and artistic attraction at discounted prices. MSC obtained some docking facilitations and the city managed to launch a programme that somehow direct cruisers on the type of routes and local activities the city wanted to promote. (Gui L., Russo, A.P.)

Over the past several years the Dubrovnik Port Authority, according to provisions of the study "Sustainable cruise tourism development in Croatia" prepared by the Institute of Tourism, has been attempting to limit the number of cruise passengers. New measures were introduced which, considering the huge demand for Dubrovnik as one of the most attractive destinations in the Mediterranean, in most cases limit the number of cruise passengers to 8,000 per day.

2.1. Cruise passenger traffic in the Port of Dubrovnik 2004.-2018.

Dubrovnik is the most important cruise port in Croatia, in perspective of cruise passenger traffic in the Adriatic Sea, Dubrovnik is 2nd with 16% of Adriatic cruise passenger traffic (Zanne & Bešković, 2018). The Mediterranean is the strongest market in Europe and the second in the world, with Barcelona ahead of cruise passengers. In perspective of cruise passenger traffic in Mediterranean Sea Dubrovnik is 12th (Med Cruise Association, 2017) and in perspective of cruise passenger traffic in Europe Dubrovnik is 16th (Avoid Crowds 2019).

For a better picture of cruise passenger traffic in port of Dubrovnik, traffic is analysed in period of 15 years.

Table 1 Cruise passenger traffic in the port of Dubrovnik

Year	Indices	Rate of change
2004		
2005	111,11	11,11
2006	122,00	22,00
2007	119,13	19,13
2008	121,56	21,56
2009	107,55	7,55
2010	107,75	7,75
2011	114,75	14,75
2012	105,44	5,44
2013	126,89	26,89
2014	85,52	-14,48
2015	95,29	-4,71
2016	104,10	4,10
2017	88,11	-11,89
2018	103,92	3,92

Source:, author's calculations

Table 1. shows cruise passenger traffic in the port of Dubrovnik by indices and rate of change. The growth of cruise lines in Dubrovnik so far has fluctuated, but on average was extremely dynamic. Average annual growth rate over ten years in the period 2003-2013 it was a high 11.5% (Ban et al., 2014, according to statistics of the Port Authority of Dubrovnik, 2014).

In interval 2004.-2018. mean of change is eight percent per year. It is necessary to remark that a very high rate of change is recorded in 2013 in comparison with 2012., in that year the recorded growth in cruise passenger traffic is almost 27% percent.

3. AN ANALYSIS OF THE DYNAMICS OF CRUISE PASSENGER TRAFFIC IN THE PORT OF DUBROVNIK

According to the made analyses of cruise passenger traffic in the port of Dubrovnik, it observed a linear trend of traffic. From Graph 1 it can be concluded that commodity maritime traffic in the port of Dubrovnik has a linear trend and a positive inclination. Coefficient $b = 38819$ shows that in one year number of cruise passengers increases on average by 38.819.. The coefficient of determination $r^2 = 0.7409$ shows that the linear trend is representative.

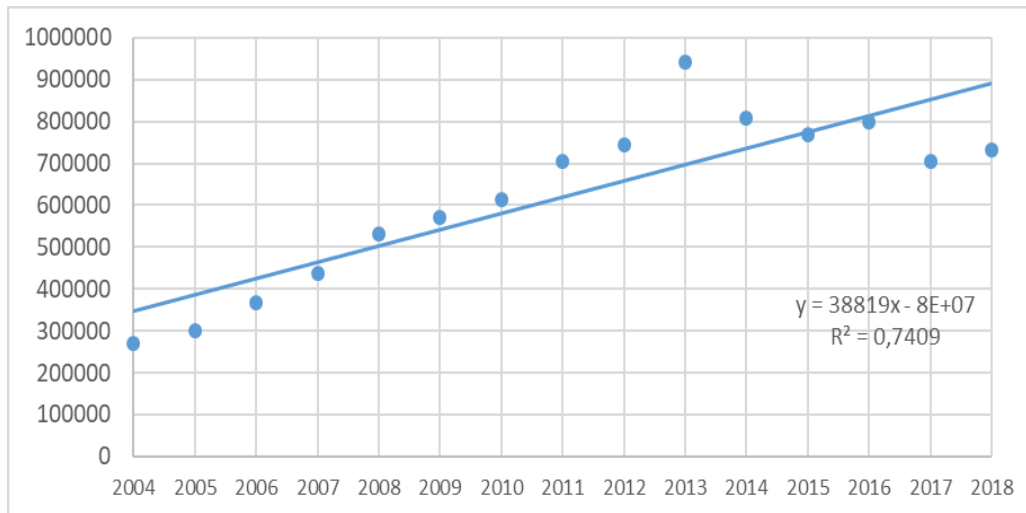


Figure 1 Linear trend of cruise passenger

Source: author's own

Table 1 shows the clear development of cruise tourism in the Port of Dubrovnik. From 2004 to 2013, a constant increase in the total number of passengers can be observed, and since 2013, the total number of passengers has varied. So it can be concluded that the positive linear trend does not describe the dynamics of cruise passengers traffic in the period from 2013 well.

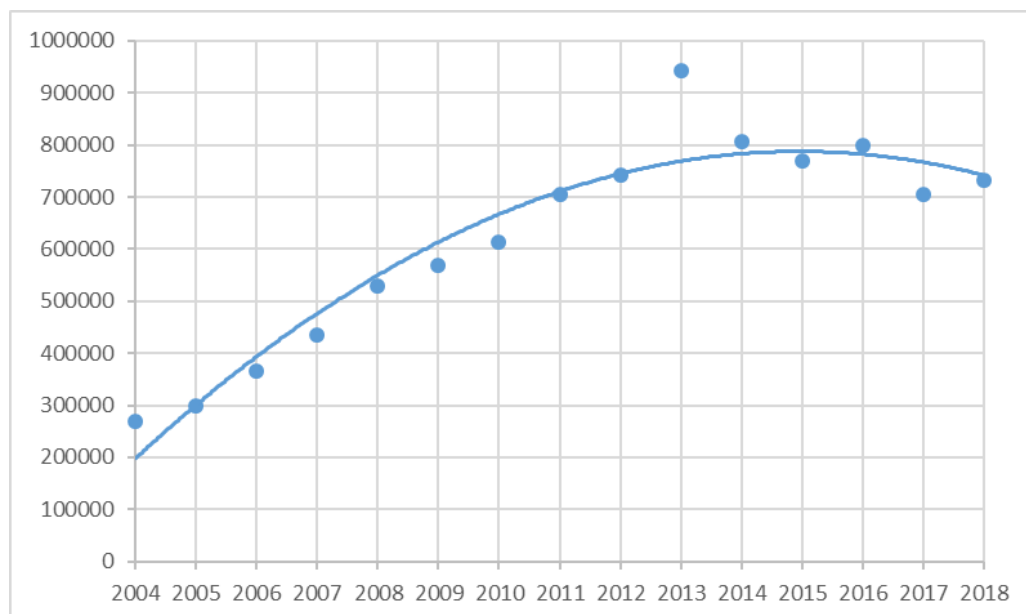


Figure 2 Parabolic trend of cruise passenger

Source: author's own

Based on the graphical representation of the total number of passengers in the port of Dubrovnik, it is concluded that the movement of cruise passenger traffic in the observed period can be represented by a second degree polynomial function, whose equation is:

$$y = -4907,4x^2 + 2E+07x - 2E+10 \quad (1)$$

$$R^2 = 0,9153 \quad (2)$$

In the given equation y represents the value of the time series, that is, in this case the cruise passenger traffic, and it is the dependent variable. The independent variable is denoted by x and it represents time. R^2 has a value approaching one which means that there was an adequate connection between the total number of passengers in the port of Dubrovnik and the time period described. The value of R^2 is between 0.8 and 1, and it is a strong, positive relationship and it is indication that model explain the data well.

Given that passenger movement is represented by a second-degree polynomial, it is difficult to predict further, future results. Significant variations in the total number of passengers have occurred in recent years, which makes it difficult to predict. The trend shows that the number of passengers will continue to decline, which is the result of measures taken by the City of Dubrovnik, not by the mismanagement of the Port of Dubrovnik. There is a problem how to stop the negative trend.

The most notable problem in Dubrovnik is the large number of tourists with a cruiser who being in a small space creates bottlenecks and long delays at entry and leaving the city cores, which becomes a big problem for Dubrovnik residents (Horak et al., 2007; Marušić et al., 2008; Peručić & Puh, 2012) and presents negative publicity for Dubrovnik tourism.

The goal of diminishing port and town congestion comes together with the declared purpose of encouraging a broader distribution of tourist flows in the territory, expanding the hinterland reach of cruise operations, and promoting less known tourism attractions. The scenery in the surrounding area of Dubrovnik is magnificent and not so well-known, but especially destination-oriented cruises can be attracted with them because they permit to surprise guests with unexpected cultural experiences.

The average number of cruise passengers per month in the observed period is calculated and graphically presented. A graphical representation of the average cruise passenger traffic by month is in the form of a bell. The graph shows that the largest number of passengers visited the Port of Dubrovnik during the peak season, namely in August. A significant increase in the number of passengers compared to the beginning of the year has been recorded since April and has increased until August. Since September, passenger numbers have been declining slightly.

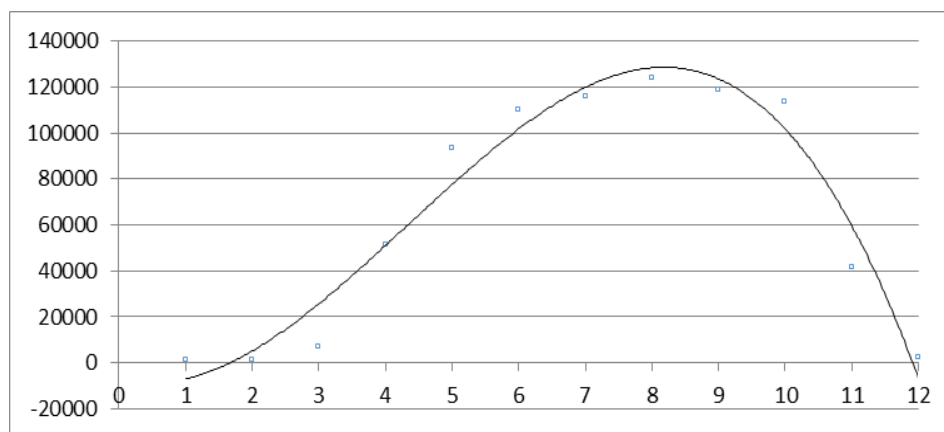


Figure 3. The average number of cruise passengers per month

Source: author's own

In order to stop the negative trend in the annual traffic of the Port of Dubrovnik, analysis showed that there is a possibility of increasing the number of cruise passengers and ships in the pre- and sub-season, respectively in March and April in the pre-season and October and November in the sub-season.

The benefits of Dubrovnik as a city with an extended season of cruise ship passengers would primarily be a good climate. The Mediterranean climate brings a large number of sunny hours and relatively mild and humid winters, suitable for prolonging the season by several months.

Also, there are many seasonal festivals in Dubrovnik throughout the year, from the Festivity of St. Blaise, Easter customs in the spring, traditional klapa songs during the "Aklapela" festival in April, the Dubrovnik FestiWine, the event "Quiet, please – Dubrovnik and film love each other", most famous Croatian cultural event – the Dubrovnik Summer Festival, a significant event that marks Dubrovnik's autumn - the Good Food Festival, the Dubrovnik Winter Festival and many other, that can be of interest to cruise passengers.

Extending the season would relieve the crowds during the peak season, and the total number of passengers would remain the same or increase even more.

It should be emphasized that companies which cooperate with port of Dubrovnik, bring their ships during a large part of the season from early March until the end of the year, sometimes even year-round, therefore active and continuous cooperation with them including certain compromises is of great importance to port of Dubrovnik. It should also be emphasized that the Dubrovnik Port Authority has refused about forty cruise call requests only in one season, in accordance with the desire to limit the number of cruise passengers.

4. CONCLUSIONS

Based on the analyses and interpretations of the appropriate data, findings from the results of the study are discussed as follows:

Firstly, the study revealed that in period 2004.-2018. mean of change in cruise passenger traffic is eight percent per year.

Secondly, the study revealed that the highest rate of change is recorded in 2013 in comparison with 2012., and growth in cruise passenger traffic was almost 27% percent.

According to the findings, it can be concluded that dynamic of cruise passenger traffic has a parabolic trend.

The goal of diminishing port and town congestion comes together with the declared purpose of encouraging a broader distribution of tourist flows in the surrounding area of Dubrovnik, promoting less known tourism attractions and providing an unexpected cultural experiences to travellers.

Finally, the study also revealed that there is a possibility of increasing the number of cruise passengers and ships in the pre- and sub-season and a possibility to stop the negative trend in the annual traffic of the Port of Dubrovnik.

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