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# The phenomenon of increasing concentration of tourism in Polish seaside regions

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**Abstract**

The aim of this article is to point to the phenomenon of increasing concentration of tourism in the Polish seaside regions. The study involved four port cities, located in two seaside voivodeships: West Pomeranian (Szczecin, Świnoujście) and Pomeranian (Gdańsk, Gdynia). They are cities where seaports of major importance for the national economy are located. The analysis of tourist traffic in these cities covers the years 1995–2014. This analysis formed the basis for the forecast to 2020. The results of extrapolation of trends are presented in the figures. Moreover, the procedure employed and structure of the article were adapted to the aim of this work.

## Introduction

The impact of tourism on regional development is multifaceted. Tourist reception areas are subject to changes, which result from the development of their tourist function. These transformations are of economic, social, cultural and spatial nature. The consequences of tourism development are felt throughout the country, voivodeships (provinces), as well as single towns or cities and depend on the concentration of tourist traffic.

Tourist traffic is called the temporary migration of people outside the place of their permanent residence, resulting from socially conditioned needs with various motivations (Kurek & Mika, 2008, pp. 13, 40–42). It can also be described more broadly as the general phenomena and effects of spatial movement of people during tourist trips (Mazurski, 2006, p. 66). In order to fulfill the tourist's needs, the tourist must move to a specific place, where the elements of tourism supply are located. Therefore, tourism demand measured by tourist traffic is characterized by mobility and concentration in space.

Tourism is directly associated with transport. It is necessary for tourists to reach their destination and navigate within the visited region. Transport services belong to basic tourist services. They are considered to be a dynamic factor in the development of tourism and its support (Gaworecki, 2010, pp. 291–292). On the other hand, the region attracts tourists and generates a demand for transport services. In addition, travelling by some means of transport is considered as a tourist attraction, e.g. cruising, small-gauge train, historic tram, etc.

There are different criteria that are applied by a tourist when choosing means of transport during a trip. In addition to financial, technical and security aspects, the transport accessibility to region is very important. The transport accessibility is not only the grid of transport links inside and outside the region, it is also the set of facilities necessary to transport operations in a given area that is called transport base of tourism (Pawlusiński, 2008, p. 166). The better the transport base of tourism, ensuring transport accessibility to a specific area, the larger its attractiveness as a destination. For these reasons, progress

in the transport field has influence on the development of tourism.

New solutions for transport stimulate an increase in carrying capacity, in both quantitative and spatial terms. They also improve the comfort of traveling. These aspects are very important in the development of port cities, which are also characterized by significant tourist traffic. The maintenance of the existing volume of tourist traffic in these areas, and its increase, are essential in the light of the development of the whole regions.

Among other things, an analysis and assessment of tourist traffic in port cities and seaside regions in Poland is useful to determine the basic conditions of tourism development. Effective stimulation of the development of these regions, taking into account the substantial impact of tourism, requires many operations that should be properly planned and coordinated. Their range is very wide and varied. Successful support for tourism requires action, inter alia in terms of the transport accessibility, tourism planning, promotion, education, security, regional and tourism policy, as well as scientific research.

Building, modernizing and evolving the passenger terminals in seaports with particular emphasis on infrastructure and logistics support of cruise ship passengers and tourists strongly affects the development of tourism in seaside regions in Poland (Christowa, 2010, p. 189); however, decisions on this type of investment should be supported by expert opinions and scientific reports. Such reports should provide predictions about the evolution of phenomena affecting the future development of seaports, port cities and seaside regions. It is necessary to take into account the scope of the impact of tourist traffic on these areas. For this reason, knowing the strengths of the region is a prerequisite for an efficient development.

## Main aim and research methods

The aim of this article is to point to the phenomenon of increasing concentration of tourism in the Polish seaside regions, with particular emphasis on port cities (Szczecin, Świnoujście, Gdańsk, Gdynia). These are cities where seaports of major importance for the national economy are located. Particular attention is paid to the role of tourist traffic in the development of these cities and all regions.

The study involved four port cities, located in two seaside voivodeships: West Pomeranian (Szczecin, Świnoujście) and Pomeranian (Gdańsk, Gdynia). These are the cities with powiat (county) rights. Besides, Świnoujście has the status of seaside health resort. The analysis of tourist traffic in these cities covers the years 1995–2014 and formed the basis for the forecast to 2020. The prediction was made by extrapolating estimated trends (linear and parabolic). The results of these extrapolations are presented in the figures.

The source of statistical data was the Local Data Bank of the Central Statistical Office. Moreover, the study procedure and structure of the article were adapted to the aim of this work.

## Analysis of results

In both Polish seaside voivodeships, much greater tourist traffic is evident in the areas located in the seaside compared to other zones. The seaside areas include six powiats of the West Pomeranian voivodeship and eight of the Pomeranian voivodeship; as illustrated in Figures 1 and 2.

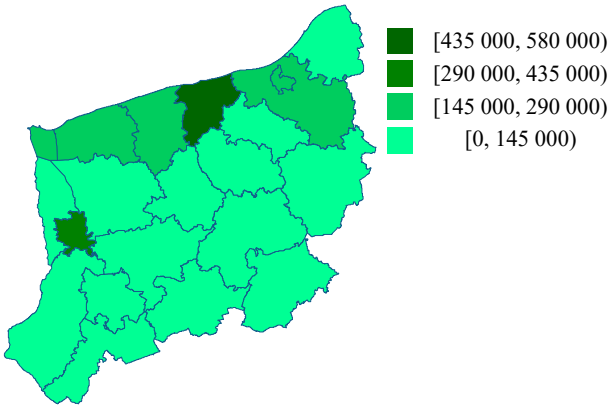


**Figure 1. Diversification of tourist traffic in the powiats of the West Pomeranian voivodeship in 2014 by number of tourists staying at accommodation (author's findings, source: Central Statistical Office, 2016)**

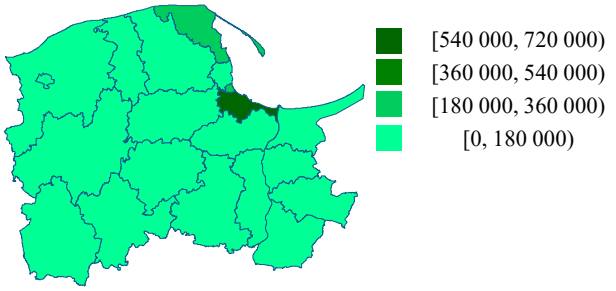


**Figure 2. Diversification of tourist traffic in the powiats of the Pomeranian voivodeship in 2014 by number of tourists staying at accommodation (author's findings, source: Central Statistical Office, 2016)**

In 2014, 27.63% of visitors staying in tourist accommodation in the West Pomeranian voivodeship

chose Szczecin (17.27%) or Świnoujście (10.36%). In the Pomeranian voivodeship, the share of Gdańsk and Gdynia is 32.73% and 5.32%, respectively, for a total of 38.05%.

In the years 1995–2014 the number of tourists accommodated in the establishments located in Świnoujście increased by 222.73%. Changes of this value are shown by the linear trend:

$$\hat{y}_t = \underset{[12\,162]}{75\,128} + \underset{[1015]}{5033}t \qquad (1)$$

On this basis it can be said that during this period the number of tourists increased year by year by an average of 5033 (taking into account that, based on the standard error of estimate for this parameter, the error may be 1015 and is the value provided in the square brackets under the parameter). Unfortunately, this model matches empirical data only in 57.72% of cases (determination coefficient is $R^2 = 0.5772$), and the standard error of estimate amounts to 26,181 tourists. Both parameters of the model are statistically significant.

A better matching to the actual value has a parabolic trend with the following form:

$$\hat{y}_t = \underset{[18\,332]}{101\,221} - \underset{[4021]}{2084}t + \underset{[186]}{339}t^2 \qquad (2)$$

In this case, a higher coefficient $R^2 = 0.6463$ and lower standard error of estimate (24,640 tourists) were obtained. However, both variables $t$ and $t^2$ have proved to be statistically insignificant.

Despite the imperfections of both estimated functions of the development trend, the number of tourists that will be accommodated in tourist facilities in Świnoujście until 2020 was predicted (using extrapolation of these trends) will be. The results should be considered as an estimate and are presented in Figure 3.

Significant annual increases in the number of tourists in the period 2012–2014 could have an impact on the moderate matching of the trend function with empirical data over the entire period. This is related with the change in the methodology of data collection by the Central Statistical Office. Since 2012 the tourist accommodation facilities have also included agro touristic lodgings and guest rooms. Unfortunately, the lack of information on such facilities at the powiat level makes it impossible to correct data by minimizing the number of tourists by those choosing this type of accommodation. On the other hand, all the tourists staying in accommodation facilities generate demand for goods and services in a particular area. It must be remembered that the forecast might

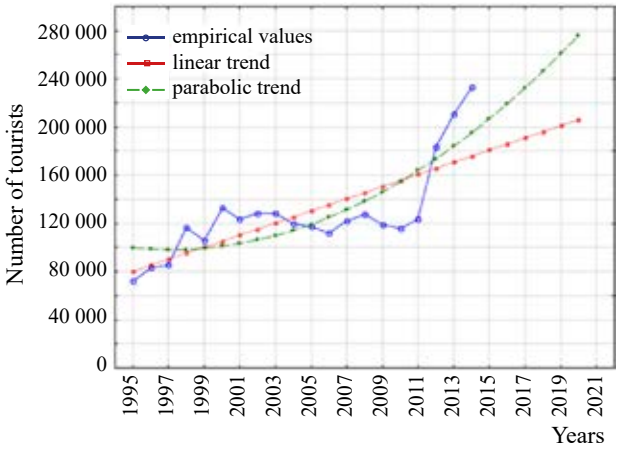


**Figure 3. Tourists staying at tourist accommodation establishments in Świnoujście in the years 1995–2014 and forecast to 2020 (author's findings, source: Central Statistical Office, 2016)**

not be completely correct. Although it is difficult to currently identify the reasons that could lead to the situation, in which the tendency sudden collapses, it is likely that the growth rate may decrease, and not be as high as indicated by forecasts made on the basis of a quadratic trend extrapolation.

However, the number of tourists accommodated in the establishments located in Gdańsk in the years 1995–2014 increased by 169.64%. Changes of this value are shown by the linear trend:

$$\hat{y}_t = \underset{[27\,409]}{197\,981} + \underset{[2288]}{18\,623}t \qquad (3)$$

On this basis it can be said that during this period the number of tourists increased year by year by an average of 18,623. This model matches empirical data in 78.63% of cases and the standard error of estimate amounts to 59,003 tourists. Both parameters of the model are statistically significant.

A much better matching to the actual value has a parabolic trend with the following form:

$$\hat{y}_t = \underset{[22\,337]}{324\,425} - \underset{[4899]}{15\,862}t + \underset{[227]}{1642}t^2 \qquad (4)$$

In this case, a higher determination coefficient $R^2 = 0.9478$ and lower standard error of estimate (30,023 tourists) were obtained. In addition, both parameters of the model are statistically significant.

Figure 4 shows the results of the prediction made on the basis of the extrapolation of the two estimated trends. Despite a marked increase in the number of tourists in the years 2012–2014 (also for reasons described above), both functions have a much better match to the empirical values than in the case of Świnoujście. Particularly optimistic is the forecast

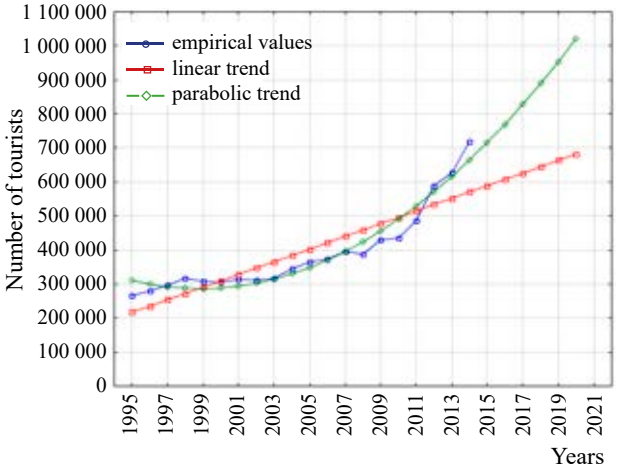


**Figure 4. Tourists staying at tourist accommodation establishments in Gdańsk in the years 1995–2014 and forecast to 2020 (author's findings, source: Central Statistical Office, 2016)**

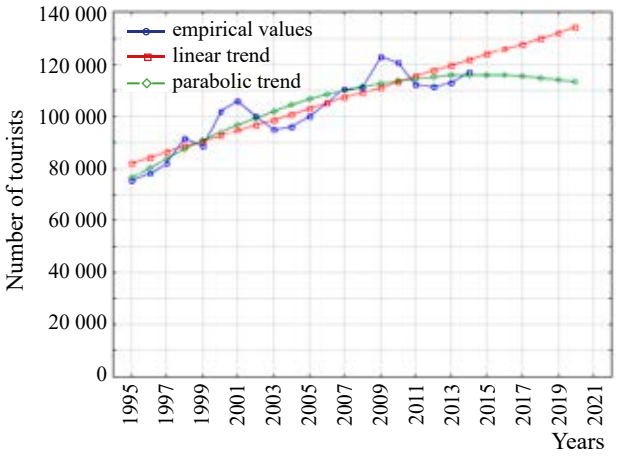


**Figure 5. Tourists staying at tourist accommodation establishments in Gdynia in the years 1995 – 2014 and forecast to 2020 (author's findings, source: Central Statistical Office, 2016)**

based on the parabolic function, according to which the number of tourists staying in Gdańsk base in 2020 will increase by 42.06% (in comparison to the year 2014). It cannot be ruled out that this scenario will come true in the future.

The development trend of tourists accommodated in the establishments located in Gdynia in the years 1995–2014 has been described with the following linear function:

$$\hat{y}_t = \underset{[2901]}{80\,049} + \underset{[242]}{2082}\ t \tag{5}$$

and parabolic function:

$$\hat{y}_t = \underset{[4107]}{72\,164} + \underset{[901]}{4232}\ t - \underset{[42]}{102}\ t^2 \tag{6}$$

The number of tourists in this period increased by 55.58%. The adopted linear trend model matches the data in 80.41% of the instances considered. It assumes an annual growth of about 2082 tourists and the standard error of estimate amounts to 6245 tourists. A slightly better matching to the actual data is shown by the parabolic function ($R^2$ = 0.8555, the standard error of estimate 5520). All parameters of models (5) and (6) are statistically significant.

The results of the forecasts prepared on the basis of the extrapolation of trends are shown in Figure 5. The prediction based on the parabolic function is pessimistic, because it assumes a decline in the number of tourists. More optimistic is the forecast based on the linear trend, according to which the number of tourists staying in Gdynia in 2020 will increase by 14.87% (in comparison to the year 2014).

In the years 1995–2014 the number of tourists accommodated in the establishments located in Szczecin increased by 24.54%. It was the smallest percentile growth among the four port cities considered. Also, the greatest fluctuations in the number of tourists is observed in Szczecin, especially during the first part of the time frame considered (1996–2003). To smooth out these fluctuations, the data from the years 1996–2003 were considered outlying observations (these observations may result in disturbance of the result of the analysis of time series (Masłowska, 2015, pp. 20–21)). This was confirmed on the basis of the scatter diagram of dependent variable and analysis of residuals. If outlying observations are deleted, it is necessary to estimate the missing data (Zeliaś, Pawełek & Wanat, 2003, p. 26). For this purpose a simple moving average method was used (Machowska-Szewczyk, 2007, p. 163) to replace each empirical value from the years 1996–2003 with an average of five neighboring points (years). For the year 1996 only, the average was taken on thee points, due to missing data.

After smoothing out the time series of the number of tourists accommodated in the establishments located in Szczecin, changes of this value are shown by the linear trend:

$$\hat{y}_t = \underset{[9572]}{299\,872} + \underset{[799]}{4170}t \tag{7}$$

In spite of the smoothing, this trend matches the modified empirical data only in 60.20% of cases. Both parameters of the model are statistically significant. The parabolic trend did not give a significantly better matching ($R^2$ = 0.6491); however, both variables $t$ and $t^2$ proved to be statistically insignificant.

Figure 6 shows the results of the prediction made on the basis of the extrapolation of the

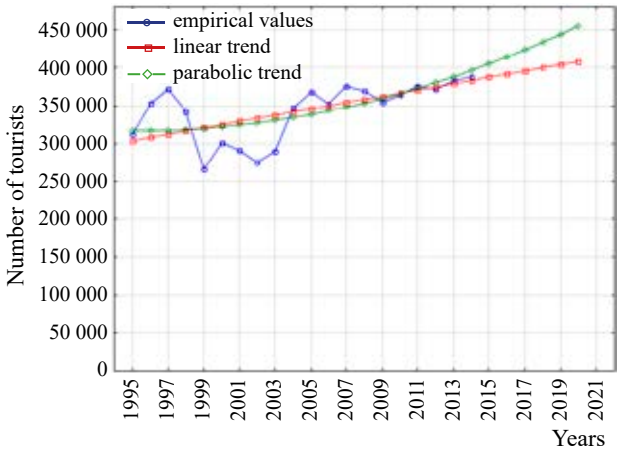


**Figure 6. Tourists staying at tourist accommodation establishments in Szczecin in the years 1995–2014 and forecast to 2020 (author's findings, source: Central Statistical Office, 2016)**

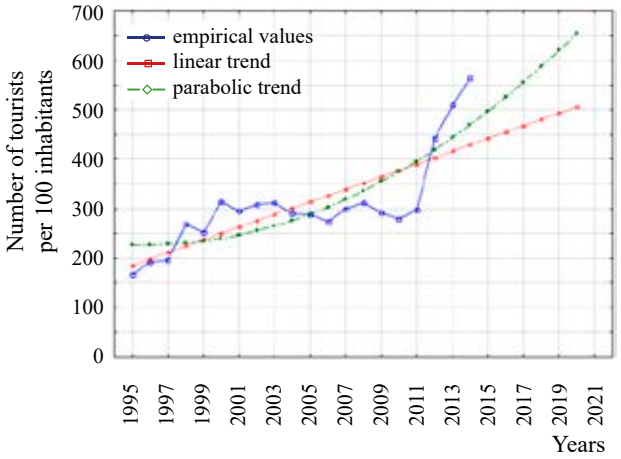


**Figure 7. Number of tourists staying at tourist accommodation establishments in Świnoujście per 100 inhabitants in the years 1995–2014 and forecast to 2020 (author's findings, source: Central Statistical Office, 2016)**

estimated trends. The results should be considered as an estimate. According to the forecast based on linear trends (7), the number of tourists staying in the Szczecin base in 2020 will increase only by 5.21% (in comparison to the year 2014). More optimistic is the forecast based on the parabolic function (17.32% increase).

In addition, an analysis of variability in the intensity of tourist traffic was carried out in the four port cities. The intensity of tourist traffic expressed with Schneider's rate reflects the number of tourists accommodated per 100 inhabitants (Warszyńska & Jackowski, 1979, p. 69).

The development trend of the tourist traffic intensity growth rate in Świnoujście in the years 1995–2014 has been described with the following functions:

$$\hat{y}_t = \underset{[28.73]}{172.97} + \underset{[2.40]}{12.81}t \quad (8)$$

$$\hat{y}_t = \underset{[28.73]}{172.97} + \underset{[2.40]}{12.81}t \quad (9)$$

Both estimates moderately explain changes in the intensity of tourist traffic in Świnoujście. The determination coefficients $R^2$ amount to 0.6132 and 0.6663, respectively. In addition, in the case of a parabolic trend (9), both variables $t$ and $t^2$ are statistically insignificant.

The results of the extrapolation of both trends are presented in Figure 7. According to the forecast prepared on the basis of function (9), in 2020 about 655 tourists (per 100 inhabitants) will choose to sleep in this area. Due to the low overall matching of the model to the empirical data, this value is only an estimate; however, assuming that the current slight downward trend in the number of inhabitants remains at a similar level and the increase in the number of tourists continues, this scenario is likely to happen.

The evolution of the tourist traffic intensity rate in Gdańsk in the years 1995–2014 is described as the following functions:

$$\hat{y}_t = \underset{[5.83]}{42.83} + \underset{[0.49]}{4.07}t \quad (10)$$

$$\hat{y}_t = \underset{[4.76]}{69.69} - \underset{[1.04]}{3.26}t + \underset{[0.05]}{0.35}t^2 \quad (11)$$

The adopted model of a linear trend (10) for 79.52% of the experiments explains the variability of the tourist traffic intensity rate in this period. It assumes that it grew year by year by an average of about 4 tourists per 100 inhabitants. A much better matching to the empirical values is shown by the parabolic function ($R^2$ = 0.9496, the standard error of estimate 6.40). All parameters of the models (10) and (11) are statistically significant.

The results of the forecasts prepared on the basis of extrapolation of trends are shown in Figure 8. Assuming the current growth rate of the number of tourists choosing to sleep in this area, according to the forecast that comply with the function (11), in 2020 this rate will reach a value of about 222 tourists per 100 inhabitants (including an error of about 6 tourists). This prediction is more optimistic; however, this value is lower than in Świnoujście. This is due to the fact that about 11 times more people live in Gdańsk.

Growth rate development trend of tourist traffic intensity in Gdynia in the years 1995–2014 has been described by the following linear function:

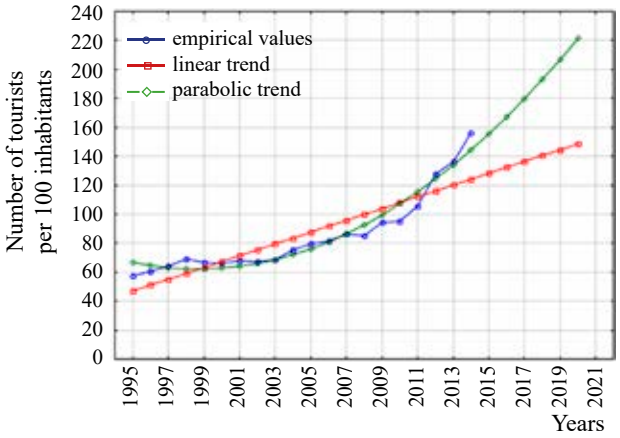


**Figure 8. Number of tourists staying at tourist accommodation establishments in Gdańsk per 100 inhabitants in the years 1995–2014 and forecast to 2020 (author's findings, source: Central Statistical Office, 2016)**

$$\hat{y}_t = \underset{[1.14]}{31.39} + \underset{[0.10]}{0.88}t \qquad (12)$$

This model matches empirical data in 82.42% of cases and the standard error of estimate amounts to 2.46 tourists per 100 inhabitants. Both parameters of the model are statistically significant. Not much better matching to the actual value has a parabolic trend ($R^2 = 0.8594$). However, variable $t^2$ has proved to be statistically insignificant.

The results of the extrapolation are presented in Figure 9. According to the forecast prepared on the basis of function (12), in 2020 about 54 tourists (per 100 inhabitants) will choose to sleep in this area.

On account of the fact that the great fluctuations in the Schneider's rate is observed in Szczecin, the data from the years 1996–2003 were considered outlying observations. This was the same finding as in the case of the number of tourists staying in tourist accommodation solutions. The same method was

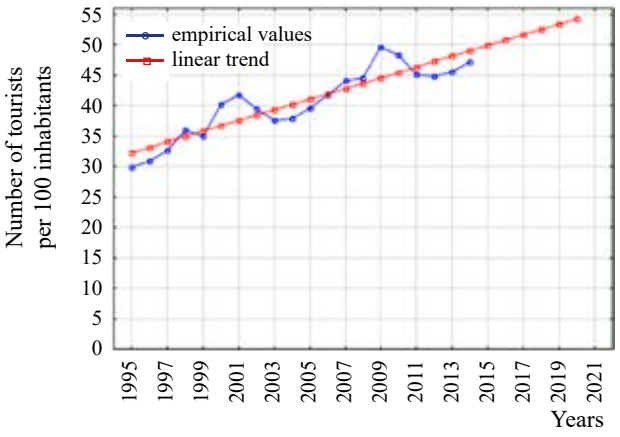


**Figure 9. Number of tourists staying at tourist accommodation establishments in Gdynia per 100 inhabitants in the years 1995–2014 and forecast to 2020 (author's findings, source: Central Statistical Office, 2016)**

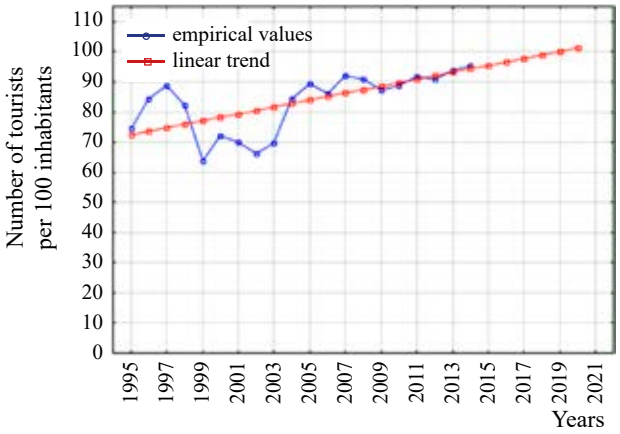


**Figure 10. Number of tourists staying at tourist accommodation establishments in Szczecin per 100 inhabitants in the years 1995–2014 and forecast to 2020 (author's findings, source: Central Statistical Office, 2016)**

applied in order to smooth out these fluctuations. After this, the evolution of the tourist traffic intensity rate in Szczecin in the years 1995–2014 is described as the following linear function:

$$\hat{y}_t = \underset{[2.36]}{71.34} + \underset{[0.20]}{1.15}t \qquad (13)$$

Despite the smoothing out of fluctuations, this model only explains the variability of the tourist intensity rate in this period in 65.44% of cases. Both parameters of the model (13) are statistically significant. The parabolic trend ($R^2 = 0.6878$) does not give much better matching; however, both variables $t$ and $t^2$ have proved to be statistically insignificant.

Figure 10 shows the results of the prediction made on the basis of the extrapolation of the estimated model. The results should be considered as an estimate. According to the forecast that comply with function (13), in 2020 this rate will reach a value of about 101 tourists per 100 inhabitants (including an error of about 5 tourists).

## Conclusions

Both Polish seaside voivodeships are characterized by increasing tourist traffic. But its concentration is spatially differentiated. Four port cities play an important role in the size and intensity of tourist traffic.

Compared to the results of the 1995 survey, the number of tourists staying at tourist accommodation establishments has increased in all four port cities in 2014. In the years 1995–1998 the highest number of tourists chose to sleep in accommodation establishments located in Szczecin. But Gdańsk has been the leader in terms of this number since the year 1999.

The biggest growth dynamics of number of tourists staying at tourist accommodation establishments during this period has also been observed there.

The highest intensity of the tourist traffic is in Świnoujście. Taking into account the possible effects associated with the increasing congestion in the health resort, it is hard to say whether this is optimistic. Certainly it requires planning relevant activities within the local and regional policy.

## References


1. Central Statistical Office (2012) *Local Data Bank*. [Online] Available from: https://bdl.stat.gov.pl/BDL [Accessed: February 22, 2016]
2. Christowa, Cz. (2010) Działania dedykowane polskim portom morskim wynikające z syntezy najlepszych praktyk stosowanych w wybranych portach europejskich. Sfera administracyjno-zarządcza, eksploatacyjno-usługowa i inwestycyjna. Rozdział w: *Analiza najlepszych praktyk w zakresie zarządzania w portach morskich Unii Europejskiej*. Pod redakcją Cz. Christowej. Szczecin: Wydawnictwo Naukowe Akademii Morskiej (in Polish).
3. Gaworecki, W.W. (2010) *Turystyka*. Warszawa: Polskie Wydawnictwo Ekonomiczne (in Polish).
4. Kurek, W. & Mika, M. (2008) Turystyka jako przedmiot badań naukowych. Rozdział w: *Turystyka*. Pod redakcją W. Kurka. Warszawa: Wydawnictwo Naukowe PWN (in Polish).
5. Machowska-Szewczyk, M. (2007) Metody dynamiki zjawisk masowych. Rozdział w: *Statystyka z pakietem Statgraphics 5.0*. Pod redakcją A. Sompolskiej-Rzechuły. Szczecin: Wydawnictwo Naukowe Akademii Rolniczej w Szczecinie (in Polish).
6. Masłowska, K. (2015) Dekompozycja szeregu czasowego. Rozdział w: *Analiza i prognozowanie szeregów czasowych z programem SAS*. Pod redakcją S. Łobejko. Warszawa: Szkoła Główna Handlowa – Oficyna Wydawnicza (in Polish).
7. Mazurski, K.F. (2006) *Geneza i przemiany turystyki*. Wrocław: Wydawnictwo Wyższej Szkoły Zarządzania (in Polish).
8. Pawlusiński, R. (2008) Transport w turystyce. Rozdział w: *Turystyka*. Pod redakcją W. Kurka. Warszawa: Wydawnictwo Naukowe PWN (in Polish).
9. Warszyńska, J. & Jackowski, A. (1979) *Podstawy geografii turyzmu*. Warszawa: Wydawnictwo Naukowe PWN (in Polish).
10. Zeliaś, A., Pawełek, B. & Wanat, S. (2003) *Prognozowanie ekonometryczne*. Warszawa: Wydawnictwo Naukowe PWN (in Polish).