
Impact of Tourism on Crime in the Polish Coastal Zone

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Abstract:

Purpose: Different types of crime occurring in or near tourist areas is an important issue. Lack of knowledge of dangerous places and reduced vigilance due to the holiday mood make tourists more vulnerable to criminal activities. This thesis, popular in literature, was subjected to empirical verification in this article on the example of Poland, which has a coastline of 770 km along the southern Baltic Sea.

Approach/Methodology/Design: The study was based on quantitative data on crime and tourism traffic available for the coastal zone of Poland at the level of 15 counties and city counties, and the extensive analysis of the literature. The tourist traffic data were collected for the number of tourists served in accommodation establishments in total and in hotels. For these two types of accommodation establishments, the four data categories were used. They were all analyzed in absolute terms and per 100 sq km. Finally, 16 indicators of tourist traffic were used in the analysis. Data on the number of committed crimes registered by Police were obtained according to the seven types of crimes. They were all analyzed in absolute terms and per 100 sq km. Two methods of quantitative spatial analysis of all above-mentioned indicators were used, the location quotient – LQ, the Pearson's correlation coefficient – R, in conjunction with the adjusted coefficient of determination ARSQ.

Findings: The concentration of tourist traffic is undoubtedly one of the reasons for the concentration of crime in the coastal zone of Poland. The analysis of density indicators confirmed that the high spatial concentration of tourism promotes a high spatial concentration of crime. Correlation analysis confirmed that both tourists in total and foreign tourists, especially those accommodated in hotels, are particularly vulnerable to criminal crimes. A strong correlation between crimes against property and against life and health has been unequivocally confirmed.

Practical Implications: The results of the research showed that to reduce crime in coastal tourist areas, the scope of monitoring and supervision should be extended around hotels and facilities visited by wealthy and foreign tourists. Programs for making these tourists aware of the threats of crimes against property and against life and health should be implemented.

Originality/Value: The presented research results are the first such attempt in the specific conditions of a country undergoing political transformation. A significant number of types of crime and forms of tourism were analyzed.

Keywords: Tourism, crime, coastal zone, Poland.

JEL classification: L83, Z320, K1.

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1. Introduction

Different types of crime occurring in or near tourist areas is an important issue. Lack of knowledge of dangerous places and reduced vigilance due to the holiday mood make tourists more vulnerable to criminal activities. This thesis, popular in literature, was subjected to empirical verification in this article on the example of Poland, which has a coastline of 770 km along the southern Baltic Sea. The main tourist attraction of the Polish coastal zone is the possibility of bathing in the sea and sunbathing on sandy beaches. Tourists also enjoy seasonal gastronomy and entertainment in the form of discos, nightclubs, concerts, and other artistic performances. Alcohol, and to some extent drug, consumption is significant during these events. Coastal passenger shipping also plays a small role. The importance of yachting is growing along with the number of yachts and new marinas.

However, this form of recreation is used by a relatively small number of the wealthiest tourists. It should be emphasized, however, that sailing conditions in the southern Baltic are difficult and require qualifications. Another type of tourists, many of them from Germany and Scandinavia, are spa patients and more and more clients of health and wellness centers. A certain group of tourists, including school trips, come to coastal cities (mainly Gdańsk, Gdynia, and Sopot) for sightseeing and cultural purposes. In recent years Sopot and Międzyzdroje have become a place where celebrities should be.

The tourist season on the southern Baltic coast lasts from mid-June to mid-September, but most tourists come in July and August. The average air and water temperature in this period is around 20° C, and the number of sunny hours per day is around 9. However, the weather in the summer season can be very variable, it can be cloudy, wet, or severely windy. It should be mentioned, however, that these are the features of a stimulant bioclimate, beneficial in some diseases.

For this reason, most of the accommodation bases and tourist facilities are seasonal. The population of small coastal towns and villages is many times higher during the tourist season than in the rest of the year. They are not only tourists, but also numerous seasonal employees of the tourist sector. This also applies to the technical and social infrastructure, economic activity, and local tax revenues. However, this does not apply to the largest seaside resorts, especially Kołobrzeg, which is the largest spa in Poland and serves mainly patients from Germany and Scandinavia.

The increased frequency of hot summer periods caused by climate change improves the attractiveness of the Polish Baltic coast for domestic tourists. In the last years,

during the full season, numerous tourist destinations, accommodation facilities, and beaches were dramatically crowded. To meet the growing demand, huge investments are made in the tourist sector, which enormously affects the economic and social structure of small coastal communities. Many of the investments are likely to upset the ecological balance of vulnerable coastal ecosystems. Due to the interests of investors, there are numerous violations of the law on spatial planning and construction laws, often tolerated by authorities and gone unpunished. To summarize, coastal areas, due to the significant accumulation of potential targets and victims of criminal activities, as well as the concentration of often cluttered economic interests, create an environment conducive to various types of crime.

2. Impact of Tourism on Crime – Literature Review

Many countries' or regions' economies are dependent on tourism (UNTWO, 2013). Therefore, the absence of phenomena that deter tourists is extremely important for the tourism industry and the wider economy (Mawby, 2014). Tourism was usually seen as a positive phenomenon. New studies have shown that tourism causes a temporary increase in population in a relatively small area, it contributes to introducing "strangers" to local communities, which in turn generates negative phenomena such as crime (Lissowska, 2017).

When potential tourists decide whether to take a vacation and where to go, they consider the risk of victimization. They usually visit safer places more often. Foreign tourists in a given country may be discouraged from visiting if the likelihood of victimization in that country is high. Several studies have shown terrorist attacks and wars limit tourist activity (Feridun, 2011; Smyth, 2009; Fleischer and Buccola, 2002). In addition to terrorism and wars, criminal activity in the destination country can be seen as a risk by potential tourists. In this case, there will be fewer foreign guests to countries with a higher crime rate. This means that crime can cause external effects in the form of restrictions on international tourism (Altindag, 2014).

Tourists easily become victims or offenders. Many factors are contributing to crimes against tourists. Namely, when leaving the place of residence, tourists often leave their everyday life there. Traveling to new places, they are focused on relaxation which weakens their vigilance. The perpetrators of crime very easily recognize the average tourist or visitor, and if they do not know the culture or language of the country they are visiting, they are at risk of being a victim of crime. Tourists are profitable goals because they usually carry large sums of money, credit cards, ID's, passports, hi-techs, phones, gold jewelry, and other valuables (Lissowska, 2017; Mawby, 2014; Williams, 2010, World Tourism Organization 1996; Fujii and Mak, 1979). In addition to various types of theft, tourists are also exposed to fraud, credit card fraud, and physical and sexual assault (Ferreira and Harmse, 2000).

Unlike locals, tourists usually don't know the dangerous places that local people usually avoid (Gallivan, 1994; Flynn, 1998). de Albuquerque and McKlroy (1999)

found that tourists in mass tourism centers are more exposed to theft or burglary, while residents are usually exposed to crimes of greater criminal importance. Dangerous places are usually crime hot spots, that is places with a high concentration of crime places (Pizam and Mansfeld, 1996). Such places include adult entertainment venues where tourists usually gather (Ferreira and Harmse, 2000).

Numerous studies confirm that tourists are more likely to be victims of crime than local residents. Inciardi (1976) confirmed this hypothesis in his research, in which he conducted interviews with criminals, they deliberately selected tourists as victims of their crimes. Similar conclusions were obtained by Harris (2012), who interviewed employees from the tourism industry. On the other hand, the analysis conducted by Michalko (2004) showed that there is a higher rate of crimes against property committed against foreign tourists, especially German tourists in Hungary. Research by Biagi *et al.* (2012) using the Generalized Methods of Moments (GMM) method also confirmed the impact of tourism on crime in tourist destinations.

There is a relationship between increases in crime and tourism. Some popular tourist destinations have a tourism-like season (Harper, 2001; Chesney-Lind and Lind, 1986; McPheters and Stronge, 1974; Walmsley *et al.*, 1983). Furthermore, in tourist venues, there is a high level of anonymity because of the high population flow and high turnover of tourists. High population flow allows criminals to blend in with the crowd. The police have to deal with a significantly increased number of people and more traffic volume (Stangeland, 1998; Schiebler *et al.*, 1996). What's more, tourists may be the victims of crime because of the conflict between tourists and residents resulting from the clash of cultures saturated with stereotypes and a false view about another culture (Prideaux, 1995).

Residents sometimes perceive tourists as a source of crime, disorders, and other problems (Mawby, 2014; Haralambopoulos and Pizam, 1996; King *et al.*, 1993; Davis *et al.*, 1988; Mawby, 2007; Milman and Pizam, 1988; Ross, 1992). Lastly, tourists can also be perpetrators of crime. For example, tourists can disturb sporting events or cause disorder on an airplane. Guests can also solicit prostitutes, buy illegal drugs, or smuggle goods from their country of origin to their destination (Brunt and Hambly, 1999).

Tourist crime is defined as a crime committed against tourists or visitors. However, studying this phenomenon among tourists is not an easy task, because there are no official statistics that separate acts committed against tourists and against residents. In addition, tourists can become both victims and themselves accomplices in various crimes (Tarlow, 2011).

The image of tourist destinations is of key importance for tourist attraction, especially for mass tourism. Guaranteeing the safety of tourists is one of the most important conditions for success in the tourism industry (Ferreira and Harmse, 2000;

Lew, 1987). Media reports of crimes against tourists affect the perception of high crime risks, which discourages international and even domestic tourists from visiting destinations projected as dangerous (George, 2002; Harper, 2001). Prosperous tourism requires guest safety (Pizam and Mansfeld, 1996). Only some countries have police that protects tourists. Routine police activities may not involve tourists. In addition, the local police can give low priority to crimes against tourists (Chesney-Lind and Lind, 1986; Inciardi, 1976).

Crimes against tourists usually involve one of the scenarios (Albuquerque De, Mcelroy, 1999): (a) a tourist is a random victim who finds himself in the wrong place at the wrong time; (b) the nightlife and entertainment of tourists provide a large number of potential victims; (c) tourists take risks more often and less frequently follow safety rules during holidays; (d) terrorists or other criminal groups may attack tourists.

The crimes against tourists explain the routine activity theory by Cohen and Felson (Cohen and Felson, 1979; Felson and Cohen, 1980). Each person's routine activities can contribute to the intersection in time and space with a rationally acting potential offender and increase the likelihood of a crime. This concept assumes that the crime is the result of direct contact of three elements, a motivated offender, appropriate facilities or victims, and a lack of efficient guards.

One more theory that attempts to explain tourism crime is the so-called Tourism Crime Cycle (Prideaux, 1996). This theory assumes that perception of a place or area, in this case, a tourist destination, determines the size of the crime. Places designated for families with children or the elderly will have a lower crime rate than places for recreation for young people (Kandy, 2003).

Tourists often do not report crimes to the police (Fujii and Mak, 1979). This is influenced by the following factors (Tarlow, 2011): (a) after the crime, the vast majority of tourists are not aware that they have been the victims of crime, this applies, in particular, to pickpocketing; (b) due to the above, the victim does not know where the crime took place, in addition, he does not know where and to whom to report. The language barrier is also not conducive to reporting crimes; (c) crime victims do not think they will recover stolen items, so there is no point in reporting such incidents.

In numerous studies focusing on the influence of tourism on crime, the mutual influence was confirmed. Allen (1999) analyzed the problem of crime among foreign tourists in Australia. Tourists are safe in this country, the percentage of victims of crime is small. The most common crimes against tourists are harassment, intimidation or bullying, and theft. Tarlow (2011) confirmed the high crime rate targeted at tourists in some cities, e.g., Rio de Janeiro, which reduced the number of tourists visiting the city. In addition, the quality of life of the city's inhabitants has also decreased.

Ochrym (1990) analyzed the casinos and cities in which they operate in Atlantic City, New Jersey, and Las Vegas. As a result of the research, he found that tourist destinations have average crime rates that differ significantly from urban areas, and are higher in Atlantic City. In 1996, Prideaux B., surveyed Australia's three largest travel destinations, Gold Coast, Cairns, and the Sunshine Coast. The analyzed destinations had different crime rates. At the two resorts, Gold Coast and Cairns, crime rates have grown in line with the tourism industry in these resorts. There was less crime in the third Sunshine Coast site. His research revealed that clubs in the Gold Coast and Cairns fostered drug trafficking for workers and tourists. Drug-related crimes are related to crimes against property.

The literature analysis carried out above allows the following conclusions to be drawn, constituting the premise of the research hypotheses verified in this work:

- Tourists can be an easier target for criminals than local people, but this cannot be confirmed without question.
- The behavior of tourists during the holiday makes them become more frequent targets for thieves.
- The impact of tourism on particular types of crime is not the same.
- Crime shows more clearly the compounds of tourism in the case of large crowded cities.
- The type of visit concerning the type of attraction visited as well as its attractiveness may have significantly different consequences for crime in a given area.

3. Research Goals and Working Hypotheses

This study aims to check whether the impact of tourism on crime, found in earlier studies, also occurs in coastal zones in Poland, which has numerous tourist attractions. This aim could be achieved by empirical verification of the following working hypotheses:

- The high spatial concentration of tourist traffic on a national scale is conducive to the high concentration of crime.
- The high density of tourist traffic on a regional scale is conducive to the high density of crime.
- Foreign tourists are particularly exposed to criminal activities.
- Tourists staying in hotels are particularly exposed to criminal activities.
- Tourists are particularly exposed to crimes against property and against life and health.
- The specificity of seasonal tourist business is conducive to committing economic crimes.
- Tourists are more often than average victims and perpetrators of crimes against sexual freedom and decency.

4. Research Scope, Data, and Methods

Spatial and temporal scope:

The delimitation of the coastal zone in Poland has been the subject of scientific discussions for years with significant practical implications. Depending on the purpose of delimitation, research approach, and above all, the availability of data, various proposals appear. The approaches within natural sciences do not take into account the boundaries of administrative units and include a land strip adjacent to the sea with a width of several hundred meters to 2 kilometers (Przewoźniak, 1991; Węśławski *et al.*, 2000). Socio-economic approaches, including those related to economic development and tourism, include either individual locations or communes with direct access to marine waters or a belt of coastal voivodships and counties (Augustowski, 1977; Dutkowski, 2004; Szwichtenberg, 2006).

In this paper, the proper empirical research was carried out for the area of the coastal zone in comparison with the whole country of Poland. The coastal zone, called in short CZ, due to lack of empirical data on crime for communes, includes counties with direct access to the Baltic Sea. It consists of 11 counties and 4 cities with county status – Gdańsk, Gdynia, Sopot, and Świnoujście, in total 15 spatial units. CZ covers an area of 12,385 sq km and counts 1,698, 234 permanent inhabitants in 2014. Poland, called in short PL, is a country in Central and Eastern Europe with an area of 312,679 sq km, numbering 38,478,602 inhabitants in 2014. CZ, therefore, represents 4% of the area and 4.4% of the population of PL.

Unfortunately, full data on crime and tourist traffic for the smallest possible spatial units (in this case counties) provided by Statistics Poland are not available for all the years of the last decade. Therefore, it was decided to carry out the whole analysis for 2014 as the average and representative for the entire period, in which the volume of tourist traffic in Poland was systematically growing and the level of crime was decreasing.

Data and indicators:

The empirical data on tourism and crime was obtained from the Local Data Bank of Statistics Poland for PL and CZ for the year 2014. Data on tourism are collected and made publicly available at a local level for communes (NTS 5). Public safety issues and police work are coordinated in Poland at the level of counties and city counties. Only at this local level (NTS 4) data on registered offenses are collected and made publicly available. For this reason, given the adjacent risk of interpretation, it was decided that the area of the CZ will cover the sum of counties and city counties with direct access to the sea in this study. Thus, they constitute the basic spatial unit for collecting empirical data.

Aiming to reduce the impact of the size of the area of spatial units on the analysis results, all indicators were used in the form of absolute values and density values, calculated per 100 sq km, tourist traffic density and crime density. The use of classic

indicators, commonly used in tourism studies, in relation to the number of permanent residents, has been abandoned, because in smaller coastal tourist cities and villages the number of the seasonal population significantly exceeds the number of the registered permanent population.

The tourist traffic data were collected for the number of tourists served in accommodation establishments in total and in hotels. For these two types of accommodation establishments the four data categories were used: (1) the number of tourists, (2) the number of foreign tourists, (3) the number of tourist overnight stays, and (4) the number of foreign tourist overnight stays. They were all analyzed in absolute terms and per 100 sq km. Finally, 16 indicators of tourist traffic were used in the analysis.

Data on the number of committed crimes registered by Police were obtained according to the following seven types of crimes: total; economic; traffic; against life and health; against property; against freedom, freedom of conscience and religion, sexual freedom and decency (in the further part of the paper the term "against freedom" is used to represent this type). They were all analyzed in absolute terms and per 100 sq km. Finally, 12 indicators of crime were used in the analysis:

Methods:

Two methods of quantitative spatial analysis of all the above-mentioned indicators were used: the location quotient – LQ, the Pearson's correlation coefficient – R, in conjunction with the adjusted coefficient of determination ARSQ.

Location quotient:

The area of compared spatial units was assumed as the reference value for calculating LQ. In this approach, LQ is the quotient of the spatial density indicator of the given phenomenon in an analyzed area by the density indicator of this phenomenon in the reference area. When these density indicators are equal, the LQ value is 1. In this case, there is no concentration of a given phenomenon in the analyzed area, its distribution is even in the analyzed and reference area. When the density indicator in the analyzed area is lower than in the reference area, the LQ value is less than 1, and when it is higher, the LQ value is more than 1 and can take any high value.

The deviation of the LQ value from 1 is a measure of the spatial concentration of a given phenomenon in the analyzed area in relation to the reference area. LQ's were calculated, both tourist traffic indicators (as LQT) as well as crime indicators (as LQC) for CZ, and the reference area is PL.

The following formulas were used:

$LQT = \text{spatial density of tourist traffic indicator in CZ} / \text{spatial density of tourist traffic indicator in PL}$.

LQC = spatial density of crime indicator in CZ / spatial density of crime indicator in PL.

LQT and LQC indicators were divided into groups using the Jenks method or the analysis of mean and standard deviation, depending on the type of distribution.

Correlation coefficient R and ARSQ:

Pearson's correlation coefficients R were calculated between all 12 indicators of crime and all 16 indicators of tourist traffic in two variants. In the first variant, they were calculated for all 15 seaside counties and city counties forming CZ. In the second variant, only 12 counties and city counties were calculated. Three cities were excluded from the analysis: Gdańsk, Gdynia and Sopot (referred to hereinafter as Tri-City) constituting the core of the Gdańsk-Gdynia metropolitan area. They occupy 3.3% of the CZ area and in 2014 they were inhabited by 44% of the permanent residents of CZ. In the same year, 51.3% of the total crimes in CZ have been committed, and 32% of the total tourists visited them. Of course, not all visitors came to the Tri-City in their free time. Also, crimes committed in their area are partially conditioned by metropolitan factors, not the coastal location. Therefore, it was considered advisable to conduct a separate correlation analysis for the entire CZ and CZ without Tri-City.

The coefficient of determination R^2 is a statistical measurement that examines how differences in one variable (e.g., number of crimes) can be explained by the difference in a second variable (e.g., number of tourists). To avoid misinterpretation due to a small number of analyzed cases (15 and 12), an adjusted coefficient of determination ARSQ was used. The statistical significance of calculated correlation coefficients R was checked using Student's t-distribution with degrees of freedom $n - 2$.

It was considered that only high coefficients R and ARSQ indicate the actual interdependence of the analyzed phenomena. Coefficients R statistically significant at a level of 0.05, and reaching simultaneously the value of the ARSQ at least 0.5, were found to show a confirmed dependency. Such ARSQ explains at least half of the strength of the statistical relationship between the analyzed variables.

5. Research Procedure

To verify the hypotheses outlined above, the following research procedure was adopted:

- Collection and initial processing of empirical data.
- Comparative analysis of tourist traffic and crime in PL and CZ
- Analysis of spatial concentration of tourist traffic and crime in CZ in relation to PL.
- Analysis of correlation between the particular indicators of tourist traffic in CZ.

- Analysis of correlation between the particular indicators of crime in CZ.
- Analysis of correlation between the indicators of tourist traffic and the indicators of crime in CZ.

6. Results

Analysis of tourist traffic in PL and CZ:

In PL in 2014 more than 25 million tourists were served, of which about 1/5 were foreign tourists (Table 1). These tourists stayed for more than 66.5 million nights, of which about 1/5 were foreign tourists. More than 16 million tourists stayed in PL in hotels, of which more than 1/4 were foreign tourists. These tourists stayed in hotels for almost 30 million nights, of which about 1/3 were foreign tourists.

In CZ about 3.5 million tourists were served, of which about 1/5 were foreign tourists (Table 1). These tourists stayed for more than 16.5 million nights, of which almost 1/4 were foreign tourists. Almost 1.5 million tourists stayed in CZ in hotels, of which more than 1/3 were foreign tourists. These tourists stayed in hotels for more than 4 million nights, of which almost 1/2 were foreign tourists.

The share of CZ in tourist traffic in PL varied greatly depending on the indicator taken into account. For the main indicator, i.e. the number of tourists, it is 13.5%. This value can be used to compare other indicators. The highest CZ share in PL (27%) concerns foreign tourist overnight stays, and a little lower (24.8%) tourist overnight stays. The share of CZ in PL (19.7%) in foreign tourist overnight stays in hotels is also significantly higher than the above 13.5%. The ratio of foreign tourists in hotels (11.5%) is slightly below, and the ratio of tourists in hotels is the lowest (9.2%). It follows that tourist stays and foreign tourist stays in CZ are longer than in PL.

This is especially true of the number of foreign tourists in hotels. Proportionally, the number of tourists in CZ hotels is lower than in hotels in PL. This is because a significant part of foreign visitors' short-term stays in hotels concerns business trips, mainly by air, which are concentrated in the capital city of Warsaw and several other metropolitan centers (Kraków, Wrocław, Gdańsk).

Therefore, we can risk a hypothesis that foreign tourists in hotels, potential specific crime victims, appear more often in CZ than on average in PL. Foreigners staying longer are particularly vulnerable to crimes due to the lack of knowledge of the local language, customs, and regulations, a tendency to frequently visit gastronomic premises, entertainment places, making random contacts, and consuming excessive alcohol and other intoxicants. The second group of potential foreign victims of crime is elderly and mostly well-off people. They are not looking for holiday adventures, lying down due to various types of disabilities can quite easily become victims. In these cases, especially when a crime is related to petty theft, fraud, or extortion, it is often not reported and recorded by the police.

Table 1. *Tourist traffic in CZ and PL in 2014*

Tourist traffic indicator	PL	CZ	PL=100
	number	number	
Tourists	25,083,978	3,395,711	13.5
Foreign tourists	5,470,335	776,500	14.2
Tourist overnight stays	66,579,589	16,543,434	24.8
Foreign tourist overnight stays	12,992,241	3,514,078	27.0
Tourists in hotels	16,138,323	1,478,591	9.2
Foreign tourists in hotels	4,521,940	519,620	11.5
Tourist overnight stays in hotels	29,900,220	4,172,627	14.0
Foreign tourist overnight stays in hotels	9,650,224	1,897,599	19.7

Source: *Local Data Bank of the Statistics of Poland, own calculations.*

Analysis of crime in PL and CZ:

In PL in 2014 more than 850 thousand crimes were committed (Table 2). More than half of all committed crimes were crimes against property. The second-largest group is economic crimes, which are almost 1/5, and the third – traffic crimes representing 1/10 of all crimes committed. The least numerous group of crimes are crimes against freedom and against life and health, both representing less than 1/20. However, it should be noted that crimes against life and health are among the most burdensome for victims and are subject to the highest penalties.

Table 2. *Crime in CZ and PL in 2014*

Types of crime	PL	CZ	PL=100
	number	number	
Total	867.855	44.278	5.1
Against property	472.515	26.598	5.6
Economic	161.135	8.313	5.2
Traffic	86.680	3.276	3.8
Against freedom	33.324	1.690	5.1
Against life and health	20.218	927	4.6

Source: *Local Data Bank of the Statistics of Poland, own calculations.*

In CZ in 2014, almost 45 thousand crimes were committed (Table 2). They accounted for 5.1% of all crimes committed in PL. This is more than the share of CZ in the area (4%) and population (4.4%) of PL. At the same time, it is significantly lower than CZ's share in the number of tourists served (13.5%), including foreign tourists (14.2%).

Table 3. *The structure of crime by types in CZ and PL in 2014*

Types of crime	PL	CZ	CZ – PL
	%	%	percent points
Total	100.0	100.0	0.0
Against property	54.3	59.9	5.6
Economic	18.6	18.8	0.2
Traffic	10.0	7.4	-2.6

Against freedom	3.8	3.8	0.0
Against life and health	2.3	2.1	-0.2

Source: Local Data Bank of the Statistics of Poland, own calculations.

The structure of crime committed in CZ by type was similar to that in PL (Table 3). However, the share of crimes against property was higher (by 5.6 percentage points), and the share of traffic crimes was significantly lower (by 2.6 percentage points).

6.1 Preliminary Comparison of Tourist Traffic Crime in PL and CZ

Based on the above analysis, it can be concluded that the concentration of tourist traffic in CZ at the national level does not lead to increased crime. It is even more documented by the indicators of the number of crimes per 1000 units of the previously analyzed tourist traffic indicators, such as the number of tourists, the number of tourists served in hotels, the number of overnight stays (Table 4).

Table 4. *The total number of crimes and tourist traffic indicators in PL and CZ in 2014*

Tourist traffic indicator	Number of crimes in total per 1000 units of indicator		
	PL	CZ	PL/CZ
Tourists	35	13	3
Foreign tourists	159	57	3
Tourist overnight stays	13	3	5
Foreign tourist overnight stays	67	13	5
Tourists in hotels	54	30	2
Foreign tourists in hotels	192	85	2
Tourist overnight stays in hotels	29	11	3
Foreign tourist overnight stays in hotels	90	23	4

Source: Local Data Bank of the Statistics of Poland, own calculations.

The number of crimes committed for all types of crimes in relation to tourist traffic indicators is much higher in PL than in CZ. The biggest differences are related to total and foreign overnight stay indicators, in PL the number of crimes is five times higher. Similarly, four times as high as for foreign tourist overnight stays in hotels. The lowest number of crimes occurs in the case of indicators of total and foreign tourists in hotels, they are only two times higher in PL than in CZ. When it comes to the two basic indicators – tourists and foreign tourists – they are three times higher.

It can be assumed that there are several reasons for this situation. The first one is because increased crime in CZ concerns two months of the tourist season, while in PL it is the whole year. Secondly, the victims of crime in PL are mainly local residents, not visitors. Thirdly, hotel stays in CZ are longer on average than in PL, as they are practically not related to business trips. Most tourists in total and foreign tourists in overnight stays perform in metropolitan centers - e.g. Warsaw due to the political and economic importance of the capital and the function of an air hub, in

Krakow due to the national and international tourist attractiveness. Fourth, tourists staying in hotels in CZ are more prone to crime for various reasons than those served in hotels elsewhere, especially in big cities. To sum up, it should be stated that, in the light of empirical data, the crime intensity in CZ is on average three times lower than in PL. However, this is not, for the above-mentioned reasons, evidence that tourism has no impact on crime, which will be shown later in the article.

The spatial concentration of tourist traffic in CZ in relation to PL:

A simple analysis of LQT indicators shows a high concentration of tourist traffic in CZ in relation to PL (Table 5). Three indicators show the highest spatial concentration: foreign tourists overnight stays, tourists overnight stays, and foreign tourists overnight stays in hotels. The spatial density of these indicators in CZ is at least five times higher than in PL. The lower level of spatial concentration - more than three times - concerns tourists in total and foreign tourists. The lowest concentration occurs in hotels above this phenomenon applies to hotels, 2.3 for tourists in hotels, and 2.9 for foreign tourists in hotels.

Table 5. *The spatial concentration of tourist traffic in CZ in relation to PL*

Tourist traffic indicators	LQT
Tourists	3.4
Foreign tourists	3.6
Tourist overnight stays	<u>6.3</u>
Foreign tourist overnight stays	<u>6.8</u>
Tourists in hotels	2.3
Foreign tourists in hotels	2.9
Tourist overnight stays	3.5
Foreign tourist overnight stays in hotels	<u>5.0</u>

Note: LQT: 5.0 – 6.8 very high, 2.3 – 3.6 high (division into groups according to the Jenks classification).

Source: Own calculations.

6.2 The Spatial Concentration of Crime in CZ in Relation to PL

The spatial concentration of crimes in CZ in relation to PL is much lower than in the case of tourist traffic but quite clear (Table 6). The highest values are obtained for crimes against property (1.6) and economic crimes (1.6) and crimes in total (1.5). The spatial density of these indicators in CZ is at least 1.5 times higher than in PL.

The lowest concentration occurs for traffic crimes (1.3), and crimes against freedom (1.3). The differences in the concentration rates of particular types of crimes in CZ in relation to PL are different from the differences among the concentration rates for particular indicators of tourist traffic.

Table 6. *The spatial concentration of crime in CZ in relation to PL*

Type of crime	LQC
Total	1.5
Against property	1.6
Economic	1.6
Traffic	1.3
Against freedom	1.3
Against life and health	1.4

Note: *LQC 1.5 - 1.6 high, 1.3 - 1.4 average, (division into groups according to the classification of mean and standard deviation).*

Source: *Own calculations.*

Analysis of correlation between the indicators of the tourist traffic and the indicators of crime in CZ:

The performed correlation analysis for CZ aims to establish the relationship between particular indicators of tourist traffic and indicators of particular types of crime. The independent variables (causes) were indicators related to tourist traffic, and the dependent variables (effects) were indicators of crime. The results of the correlation analysis showed a significant diversification of these cause-effect relationships, but also some clear regularities.

At the outset, it should be stated that the absolute value indicators diagnose other regularities than the indicators per square km. Moreover, the results of the analysis for all 15 CZ counties also partially differ from the results for 12 CZ counties, i.e. after excluding the core of the Gdańsk-Gdynia-Sopot - Tri-City metropolitan area. However, they show different aspects of the phenomenon under study and enable more sophisticated conclusions. The indicators of tourist traffic density and crime better reflect the studied interdependencies. The following tables and commentaries show the measures of the strong impact of tourism on crime, selected by the principles presented in the methodological part.

Table 7. *Impact of tourist traffic on crime in the Polish coastal zone in 2014 (15 powiats)*

Influencing tourist traffic indicators	Influenced types of crime	Correlation coefficient R	Adjusted coefficient of determination ARSQ
Tourists		0.775	57.1
Foreign tourists in hotels	Total	0.749	52.7
Tourists in hotels	Against life and health	0.792	59.9
Foreign tourists in hotels		0.787	59.0
Tourists in hotels	Against property	0.814	63.7
Foreign tourists in hotels		0.796	60.5

Statistical significance ratio R at the level of 0.05 for 15 powiats = 0.514		
Average for 48 R	0.392	17.0
Maximum for 48 R	0.814	63.7
Minimum for 48 R	-0.266	-7.7
Range for 48 R	0.658	24.7

Source: Own calculations.

Table 7 shows for 15 powiats of CZ the strong influence of tourist traffic indicators in absolute values (number of tourists) on the types of crimes in absolute values (number of crimes) for 15 powiats of CZ. The average, maximum and minimum values of all R and ARSQ (48 calculations each) are shown at the bottom of the table. The significance factor R at the level of 0.5 is 0.514. However, the correlation coefficients for 48 coefficients are strongly differentiated, from a maximum of 0.814 to -0.266, which gives a range of 0.658. The mean value is 0.392, below the statistical significance level. The situation is similar to ARSQ. The maximum is 63.7 and the minimum is -7.7, which gives a range of 24.7. The mean value of 17.0 is significantly below the adopted threshold of 50.0.

However, some clear relationships emerged. The numbers of tourists in total and foreign tourists in hotels strongly affect the number of crimes in total, against life and health, against property. This is a very important result showing that there is a fundamental cause-and-effect relationship between the volume of tourism and crime in CZ, as measured by basic, widely available indicators such as the number of tourists and the number of crime.

Table 8 shows for 15 powiats of CZ the clear effects of numerous indicators of tourist traffic density (number of tourists per 100 sq. km) on the crime density (number of crime incidents per 100 sq. km) for two types of crimes in absolute values (number of crimes) for 15 CZ counties, crime in total and economic crime. Density indicators significantly affect: Tourists, Foreign tourists, Tourists in hotels, Foreign tourists in hotels, Foreign tourist overnight stays in hotels. This means that the tourist traffic density indicators for total tourists, especially wealthier and foreign tourists staying in hotels, also for longer periods, explain both the total crime density and the specific type of economic crime. Wealthy tourists, who live in hotels, especially foreign ones, are easy and attractive targets for criminals. Higher turnover and a greater amount of cash introduced into the local circulation by this type of tourist generate economic crime. The average maximum and minimum values of all R and ARSQ (48 calculations each) are shown at the bottom of the table. The significance factor R at the level of 0.5 is 0.514.

Table 8. Impact of tourist traffic density on crime density in the Polish coastal zone in 2014 (15 powiats)

Influencing tourist traffic density indicators	Influenced types of crime	Correlation coefficient R	Adjusted coefficient of determination ARSQ
Tourists	Total	0.929	85.2
Foreign tourists		0.925	84.5
Tourists in hotels		0.930	85.5
Foreign tourists in hotels		0.931	85.7
Tourist overnight stays in hotels		0.928	85.1
Foreign tourist overnight stays in hotels		0.928	85.1
Tourists	Economic	0.954	90.3
Foreign tourists		0.941	87.7
Tourist overnight stays		0.927	84.9
Tourists in hotels		0.959	91.4
Foreign tourists in hotels		0.952	89.8
Tourist overnight stays in hotels		0.955	90.6
Foreign tourist overnight stays in hotels		0.932	85.8
Statistical significance ratio R at the level of 0.05 for 15 powiats = 0.514			
Average for 48 cases		0.894	78.8
Maximum for 48 cases		0.964	92.4
Minimum for 48 cases		0.759	54.4
Range for 48 cases		0.135	

Source: Own calculations

Correlation coefficients are not significantly differentiated. For 48 coefficients, they strongly range from a maximum of 0.964 to 0.759, which gives a range of 0.135. The mean value is 0.894, well above the threshold of statistical significance. The situation is similar to ARSQ. The maximum is 92.4 and the minimum is 54.4 which gives a range of 38.0. The average value of 78.8 is well above the adopted threshold of 50.0.

Table 9 Impact of tourist traffic on crime in the Polish coastal zone in without Tri-City in 2014 (12 powiats)

Influencing tourist traffic indicators	Influenced types of crime	Correlation coefficient R	Adjusted coefficient of determination ARSQ
Tourists in	Total	0.376	5.5

hotels	Economic	0.318	1.1
	Traffic	0.135	-8.0
	Against life and health	0.159	-7.2
Statistical significance ratio R at the level of 0.05 for 12 powiats = 0.576			
Average for 48 R		-0.008	-7.2
Maximum for 48 R		0.473	14.6
Minimum for 48 R		-0.336	-10.0
Range for 48 R		0.809	24.6

Source: Own calculations.

Table 9 shows that the exclusion from the analysis of the three Powiats Gdańsk, Gdynia, and Sopot, with the largest number of tourists, accommodation places, and tourist attractions, constituting the core of the urban agglomeration, completely changes the image of the analyzed interdependencies. There is practically no empirical evidence of any impact of tourism on crime. The only indicator showing some slight impact on all types of crime is Tourists in hotels. It has little impact on crime in total and economic, traffic, and against life and health crimes. The R and ARS indicators, however, are well below the statistical significance thresholds. However, compared to other indicators, oscillating around 0.0, it is a hint. Of course, it should be taken into account that in urban agglomerations, tourists constitute a small percentage of the ambient population and many other factors generate crime.

The average maximum and minimum values of all R and ARSQ (48 calculations each) are shown at the bottom of the table. The significance factor R at the level of 0.5 is 0.576. The correlation coefficients R_i are poorly differentiated. For 48 coefficients, they range from a maximum of 0.473 to -0.336, which gives a range of 0.809. The mean value is -0.008, well below the threshold of statistical significance. The situation is similar to ARSQ. The maximum is 14.6 and the minimum is -10.0, which gives a range of 24.6. The mean value of -7.2 is well below the adopted threshold of 50.0.

Table 10. *Impact of tourist traffic density on crime density in the Polish coastal zone without Tri-City in 2014 (12 powiats)*

Influencing tourist traffic density indicators	Influenced types of crime	Correlation coefficient R	Adjusted coefficient of determination ARSQ
Tourists in hotels		0.778	56.6
<u>Foreign tourist overnight stays in hotels</u>	Total	<u>0.993</u>	<u>98.5</u>
Tourists		0.831	65.9
Foreign tourists		0.908	80.7
Tourist overnight stays	Traffic	0.784	57.7
Foreign tourist overnight stays		0.886	76.4

Tourists in hotels		0.835	66.7
Foreign tourists in hotels		0.916	82.4
Tourist overnight stays in hotels		0.851	69.6
Foreign tourist overnight stays in hotels		0.910	81.1
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Tourists		0.847	69.0
Foreign tourists		0.866	72.4
Tourist overnight stays		0.785	57.8
Foreign tourist overnight stays		0.845	68.5
Tourists in hotels	Against life and health	0.823	64.5
Foreign tourists in hotels		0.869	73.0
Tourist overnight stays in hotels		0.826	65.0
Foreign tourist overnight stays in hotels		0.861	71.5
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Tourists		0.768	54.9
Foreign tourists		0.749	51.6
Foreign tourist overnight stays		0.752	52.2
Tourists in hotels	Against property	0.843	68.2
Foreign tourists in hotels		0.750	51.8
Foreign tourist overnight stays in hotels		0.792	59.0
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Statistical significance ratio R at the level of 0.05 for 12 powiats = 0.576			
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Average for 48 R		0.836	67.3
Maximum for 48 R		0.993	98.5
Minimum for 48 R		0.750	51.6
Range for 48 R		0.157	46.9

Source: Own calculations.

Table 10 shows, for 12 CZ counties, clear effects of numerous indicators of tourist traffic density (number of tourists per 100 sq km) on the crime density (number of crime incidents per 100 sq km) for four types of crime: crime in total, traffic, against life and health and against property. The last three indicators are significantly influencing: Tourists, Foreign tourists, Tourists in hotels, Foreign tourists in hotels, Foreign tourists in hotels, Foreign tourist overnight stays in hotels. Only crime on total density is correlated with two indicators of tourist traffic density, Tourists in hotels, Foreign tourist overnight stays in hotels.

This means that the tourist traffic density indicators for 12 CZ poviats, especially affluent and foreign tourists staying in hotels, also for longer periods, explain both crimes in total density and widespread, burdensome and dangerous traffic against life and health and against property. Similarly (Table B) was the case for the entire CZ (15 poviats, see Table 8).

It is worth noting that only two indicators of tourist traffic density explain the frequently used and sometimes the only available indicator of the number of crimes in total committed in a given area but per sq km. The average, maximum and minimum values of all R and ARSQ (48 calculations each) are shown at the bottom of the table. The significance factor R at the level of 0.5 is 0.576. The correlation coefficients are very high and not very differentiated. For 48 coefficients, they range from a maximum of 0.993 to a minimum of 0.750, which gives a range of 0.157. The mean value is 0.836, well above the threshold of statistical significance. The situation is similar to ARSQ. The maximum is 98.5 and the minimum is 51.6, which gives a range of 46.9. However, the average value of 67.3 is below the adopted threshold of 50.0.

7. Discussion

Data collected by communes may interfere with the results obtained. Such data, both for crime and tourist traffic, is unfortunately not available or not credible. However, data analysis according to coastal communes, especially in the CZ (up to 2.5 km from the shoreline) would probably show even higher rates of concentration of crime and tourism and clearer connections between them.

Other own research carried out in coastal cities, also on a local scale, show difficulties in the interpretation of the obtained results, especially when the urban areas are adjacent to the sea waterfront. Some methodological doubts may be raised by the small number of poviats (12 and 15) used in the correlation analysis. For this reason, the ARSQ index was used and very strict criteria for recognizing the correlation as significant were adopted.

8. Conclusions

The main hypothesis has been confirmed. The concentration of tourist traffic is undoubtedly one of the reasons for the concentration of crime in CZ in PL. The analysis of density indicators confirmed that the high spatial concentration of tourism promotes a high spatial concentration of crime. The hypothesis that tourists are more than average victims and perpetrators of crimes against freedom has not been confirmed. In the results of the carried out analysis for the Polish CZ, such offenses, as well as traffic crimes, are poorly connected with the tourist movement.

Summing up, tourism, strongly concentrated on the coastal areas of PL, contributes to the increase in crime, but it does not have a strong impact and applies only to certain types of crimes: against property, and against life and health.

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