Social and Spatial Determinants of the Spatial Structure of Crime in Szczecin, Poland

Submitted 18/02/24, 1st revision 16/03/24, 2nd revision 20/04/24, accepted 28/05/24

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New title: Influences of Social and Spatial Factors on Crime Patterns in Szczecin, Poland

Abstract:

Purpose: The aim of this research is to identify socio-economic determinants of crime at an intraurban scale. To achieve this goal, the following two research questions were formulated: Which types of crimes are determined by socio-economic variables on a intraurban scale? Which socio-economic variables determine crime the most?

Design/Methodology/Approach: The study's design and methodology for the City of Szczecin involved systematic data collection from formal repositories (Szczecin City Police Headquarter, Szczecin City Hall, Municipal Family Support Center in Szczecin, Poviat Employment Office in Szczecin, and the Topographic Geodatabase for the City of Szczecin) covering 37 neighborhoods over 2015-2017. Backward Stepwise Regression, assessed the impact of multiple independent variables on each dependent variable. Model adequacy was ensured by iteratively refining variables until meeting predefined criteria: $R^2 \geq 0.5$, $p < 0.05$, and $VIF < 5.0$. Variable selection considered literature and data availability, with separate analyses for each dependent variable, and subsequent presentation of models meeting the criteria.

Findings: this study help to understand the relationship between different types of crimes and socio-economic factors in city neighborhoods. This approach identifies key variables that significantly affect crime intensity. The research contributes to urban crime prevention by emphasizing the importance of targeted socio-economic policies and planning. It suggests addressing alcohol outlet density, unemployment, and social assistance programs to effectively reduce crime in urban areas.

Practical Implications: The research results facilitate the formulation of several recommendations for policymakers aimed at crime prevention and reduction. The appropriate shaping of social policy, coupled with strategic spatial planning and

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development, are potent tools for reducing crime rates and enhancing safety levels in urban areas.
Originality/Value: *The article presents the results of own desk research. The issue presented has not previously been addressed in discussions published internationally.*

Keywords: *Socio-economic determinants; spatial determinants; urban crime; backward stepwise regression; policy implications.*

JEL codes: *E24, E61, I31, I38, O15.*

Paper type: *Research article.*

1. Introduction

The investigation into the socio-economic determinants of crime rates encompasses a range of theories and empirical studies. Three predominant theories offer frameworks for understanding these relationships: (1) Merton's (Merton, 1938) strain theory; (2) social disorganization theory of Shaw and McKay (Shaw and McKay, 1942), (3) Becker's (Becker, 1968) economic theory of crime.

The first theory claims that if the success or relative success of people around people, who have not been successful causes them to become frustrated about it. The frustrated members of society commit crimes when they have the need to purchase material goods that are difficult to access. The purchase of these goods is identified with the achievement of goals set by society, whereby certain limitations must be overcome in order to achieve them.

The second theory suggests that crime is more prevalent in communities where social control mechanisms are weakened. Factors such as poverty, racial diversity, frequent residential mobility, and family instability are seen as undermining the community's ability to regulate behavior, thereby increasing the likelihood of crime.

The third theory presents a perspective where crime is viewed as a rational choice, made after weighing the potential economic benefits against the risks involved, such as the likelihood of arrest and the consequences of imprisonment. This theory underscores the influence of income disparities in the decision to engage in criminal activities.

Becker's research into the social and economic aspects of criminal behavior has shown that crime is an important economic activity or industry that is

underestimated by economists. He argues that criminal behavior is not the result of social oppression or mental illness, and that criminals are helpless victims, but that their behavior is the result of calculating the financial benefits of their criminal acts against the income obtained as a result of legal work, including the risk of being arrested and imprisoned for the committed act.

Becker argues that the individual makes a rational choice as a result of the analysis of dividing time into legal and illegal activities, making the final decision based on the result of the cost-benefit analysis. An individual commits a crime when the calculated utility exceeds the utility that could be obtained by diverting his time and resources to other activities (Becker, 1968; 1993).

Another factor is the income level of potential victims of motivated perpetrators. The higher the income of the potential victim, the more motivated the potential perpetrator. The amount of income has a different impact on members of society, which with different strength act in opposite directions, motivate some to criminal activities and others make the victim of crime.

Fleisher (1966) verified the influence of income on undertaking criminal activity. Low income is a theoretically strong factor that strongly favors criminal activity, as such people have a pessimistic view of their future. The likelihood of being arrested is low, and even when there is a loss of low income, the cost of time spent in prison while serving a sentence is also low.

Ehrlich (1973) considers how levels and distribution of income contribute to the decrease or increase of the crime rate. He claims that in the analysis of potential perpetrators, the possibilities offered by the potential target of the crime are an important factor, which is particularly important in crime against property.

Brush (2007) argues that due to the unfair distribution of income, people have an increased propensity to commit crimes when they have insufficient means of subsistence; they consider themselves to be living in poverty, compared to what is considered to be the standard in a given society.

High social inequality (Buonanno, 2003) in the level of income of a given society causes great social tension and encourages people with lower incomes to engage in criminal activities. A similar study was conducted by Patterson (1991).

Fleisher (1963) conducted research exploring the relationship between crime rates and labor market conditions. This study focused on analyzing wage levels, wage distribution, and population distribution to understand their potential influence on the allocation of time between lawful and unlawful activities. Fleisher's findings suggest that unemployment notably impacts juvenile delinquency, particularly in relation to property crimes.

Research conducted by Chalfin and Raphael (2011) and Grogger (1998) also confirm that low-wage workers tend to compensate for their income with criminal activity. Whereas, the research conducted by Machin and Meghir (2000) elucidates that while higher wages tend to reduce crime rates, an increase in the direct financial gains from criminal activities can conversely lead to a rise in crime rates. Research conducted in England and Wales by Witt *et al.* (1998) shows that falling wages of lower educated men and rising unemployment rates increase crime rates.

Investigations into the correlation between education levels and criminal behavior have been extensive. Machin and Meghir (2004) conducted an analysis in the low-educated retail sector, revealing that a 10% increase in wages corresponds to a decrease in crime by 0.7 percentage points, considering an initial crime rate of 80 per 1000 individuals.

This finding aligns with Entorf and Spengler's (2000) research conducted in Germany, which also identified a connection between income levels and crime rates. Ehrlich's (1975) research highlighted a relationship between education level and crime frequency, potentially linking higher incomes to be associated with higher education levels, as noted by Machin *et al.* (2011).

The research by Oreopoulos (2007) and Lochner (2004) shows that people with higher education are more patient and unwilling to undertake risky ventures. Additionally, Usher's (1997) research not only confirmed the influence of education level on crime reduction but also suggested that this effect might stem from an increased societal awareness.

In considerations of the role of income as a factor in shaping the phenomenon of crime Fleischer (1966) and Ehrlich (1973) in their research, took into account the impact of unemployment as a factor supplementing the possibility of earning income from work undertaken on the legal labor market. Their research showed that unemployment as an indicator supplementing income has a lesser impact on crime rates than income and its distribution.

Similar results were obtained by Freeman (1994), Grogger (1998), Imrohoroglu *et al.* (2000), Reilly and Witt (1996), and Levitt (2001).

Studies on the impact of unemployment on the crime rate are varied. In addition to the ones cited above, there is also a number of studies that show that unemployment is a strong factor influencing the number of crimes committed. Persistent or increasing unemployment increases social tension and reduces control, thus increasing the motivation to commit criminal acts due to financial stress (Narayan and Smyth, 2004; Scorcu and Cellini, 1998).

Cantor and Land (1985) argue that unemployment is a short-term factor in increasing the crime rate. Studies by Raphael and Winter-Ebmer (2001) and Lin

(2008) show that unemployment has a very strong impact on property crime and, to a lesser extent, on violent crime. Gumus (2003) emphasizes that the increase in crime is favored by long-term unemployment, since people who are unemployed for a short time focus on looking for a new job. In general, Gumus (2003) distinguishes between short-term and long-term effects of being unemployed.

In the social group of young adults, a pattern of the impact of unemployment on the increase in the crime rate can be identified. This trend of research includes, among others, studies by Gould *et al.* (2002a) conducted in the USA, which showed the impact of unemployment and wages of young men with lower education on property crime and violent crime.

In a study by Fougère *et al.* (2009) in France, the strong impact of youth unemployment on property crime is shown. Finally, research in Sweden by Grönqvist (2013) also showed a strong relationship between youth unemployment and property crime and violent crime.

Cantor and Land (1985; 2001) claim that, apart from unemployment, the factor that affects the increase in the crime rate is the economic slowdown, which causes a kind of frustration of employed people, causing a kind of frustration of employees, often due to fewer hours worked, leading to lower earnings.

Research by Gould *et al.* (2002b) in the USA takes into account factors simultaneously measuring wages of men without higher education and unemployment. They pointed out that the increase in the number of crimes is more influenced by the wage factor of low-skilled men than by unemployment.

Crime is conditioned by socio-economic determinants, whereby different types of crime are determined by different socio-economic variables. The knowledge of which social and economic factors contribute to the increase or decrease in criminal behavior offers great opportunities for crime prevention and thus the development of policies aimed at preventing crime.

This study focuses on identifying these factors on an intraurban scale, which will bring knowledge to formulate recommendations for local policy makers. The aim of this research is to identify socio-economic determinants of crime at an intraurban scale. To achieve this goal, the following two research questions were formulated: Which types of crimes are determined by socio-economic variables on a intraurban scale? Which socio-economic variables determine crime the most?

2. Material and Methods

In this study, formal repositories were used. The data used came from the Szczecin City Police Headquarter, Szczecin City Hall, Municipal Family Support Center in Szczecin, Poviat Employment Office in Szczecin, and the Topographic Geodatabase

for the City of Szczecin. The study was conducted for the City of Szczecin (Poland) at the neighborhood level (37 neighborhoods). The study is based on the average number of data from the three years period, 2015-2017.

In the statistical analysis to follow, ten dependent variables and 19 independent (explanatory) variables were used. All variables are presented in Table 1.

The statistical analysis used Backward Stepwise Regression (Draper and Smith, 1998). This method is used to analyze the influence of several independent variables on one dependent variable. Based on the subject literature and taking into account the availability of statistical data, independent variables are selected.

Analysis starts with all independent variables in the model. In the subsequent steps, variables with the greatest redundancy are disconnected. The analysis ends when a satisfactory result is achieved.

However, it may also happen that under the assumed conditions (presented below), it becomes impossible to achieve a satisfactory regression model. In this case, a satisfactory model is understood as a regression model that meets the three threshold values given below. The calculations were made separately for each of the ten dependent variables. The next chapter presents those regression models for which the coefficient of determination (R^2) assumed values ≥ 0.5. In addition, the p-level had to be below 0.05, and the variance inflation factor (VIF) below 5.0.

Table 1. *Dependent and independent variables at the neighborhood level for the city of Szczecin (average number of data for the three year period from 2015-2017)*

Dependent variables at the neighborhood level

y1	Fights and battery per 1000 population
y2	Drug crimes per 1000 population
y3	Robbery crimes per 1000 population
y4	Apartment burglary per 1000 population
y5	Theft of property per 1000 population
y6	Commercial buildings burglary per 1000 population
y7	Burglary in other commercial buildings per 1000 population
y8	Property damage per 1000 population
y9	Car theft per 1000 population
y10	Car burglary per 1000 population

Independent variables at the neighborhood level

x1	Population (in thousands) per 1 sq km of inhabited area
x2	Population (in thousands) per sq km
x3	Number of unemployed per 1000 population

x4	Number of alcohol outlets per average population
x5	Number of alcohol outlets per inhabited area in sq km
x6	Total disposable income (in thousands PLN) per 1 person need to explain what PLN means
x7	Total consumption expenses (in thousands PLN) per 1 person
x8	Number of people assisted by the Municipal Family Assistance Center per 1000 population
x9	Demographic dependency ratio
x10	Share of green areas
x11	The share of the area of single-family buildings
x12	The share of the area of multi-family buildings
x13	The share of the area of hotel buildings
x14	The share of the area of office buildings
x15	The share of the area of commercial and service buildings
x16	The share of the garage area
x17	The share of the area of industrial buildings
x18	The share of the area of cultural buildings
x19	The share of the area of buildings of schools and research institutions

3. Results

Five regression models were constructed in which the threshold values mentioned in the previous chapter have been met. They concern the following dependent variables (Table 2):

y_2 – drug crimes per 1000 population
y_3 – robbery crimes per 1000 population
y_4 – apartment burglary per 1000 population
y_5 – theft of property per 1000 population
y_8 – property damage per 1000 population

In the case of drug crimes per 1000 population in the neighborhood, the regression model takes the following form:

$$y_2 = -0.584 + 3.332x_4 - 0.950x_{13} + 0.474x_{14}.$$

The conducted analysis shows that three of the independent variables have a statistical significant impact on the spatial diversity of the intensity of drug crime. An increase in the number of alcohol outlets per average population in the neighborhood and the share of the area of office buildings in the area of buildings in

total in the neighborhood raise the number of drug crimes, while an increase in the percentage of share of the area of hotel buildings in the area of buildings in total in the neighborhood has the opposite effect. Analyzing the values of partial and semi-partial correlations coefficients, it can be concluded that the number of alcohol outlets per average population in the neighborhood has the greatest impact on changes in the intensity of drug crime.

Table 2. *Characteristics of the calculated five regression models.*

Y_2 – Drug crimes per 1000 population in the neighborhood				$R^2=0.82$
Predictior	Coef	SE Coef	p	VIF
Constant	-0.584	0.279	0.044	
x_4	3.332	0.453	0.000	1.858
x_{13}	-0.950	0.241	0.000	3.239
x_{14}	0.294	0.068	0.000	1.368
y_3 – Robbery crimes per 1000 population in the neighborhood				$R^2=0.82$
Predictior	Coef	SE Coef	p	VIF
Constant	-0.492	0.201	0.020	
x_3	0.100	0.011	0.000	1.748
x_5	0.247	0.054	0.000	1.337
x_7	0.474	0.150	0.003	1.409
x_8	-0.011	0.002	0.000	2.294
y_4 – Apartment burglary per 1000 population in the neighborhood				$R^2=0.52$
Predictior	Coef	SE Coef	p	VIF
Constant	0.211	0.095	0.034	
x_4	0.011	0.002	0.000	1.101
x_8	0.010	0.002	0.000	1.101
y_5 – Theft of property per 1000 population in the neighborhood				$R^2=0.85$
Predictior	Coef	SE Coef	p	VIF
Constant	4.112	1.412	0.006	
x_4	9.967	1.126	0.000	1.342
x_8	0.105	0.029	0.001	1.271
x_{10}	-0.068	0.021	0.003	1.087
y_8 – Property damage per 1000 population in the neighborhood				$R^2=0.89$
Predictior	Coef	SE Coef	p	VIF
Constant	-2.704	0.732	0.001	
x_1	0.073	0.021	0.001	1.908
x_3	0.373	0.061	0.000	3.869
x_4	0.988	0.230	0.000	2.364
x_7	2.182	0.551	0.000	1.478
x_{11}	-0.036	0.007	0.000	3.831

In the case of robbery crimes per 1000 population in the neighborhood, the regression model takes the following form:

$$y_3 = -0.492 + 0.100x_3 + 0.247x_5 + 0.294x_7 - 0.011x_8.$$

The conducted analysis shows that as many as four of the independent variables have a clear impact on the spatial diversity of the intensity of robbery crimes. An increase in the number of unemployed per 1000 population in the neighborhood and the number of alcohol outlets per inhabited area in sq km in the neighborhood and total consumption expenses (in thousands PLN) per 1 person in the neighborhood are conducive to an increase in the intensity of robbery crimes per 1000 population.

On the other hand, an increase in the number of people assisted by the Municipal Family Assistance Center per 1000 population in the neighborhood results in a decrease in the intensity of these kind of crimes.

Analyzing the values of partial and semi-partial correlations coefficients, it can be concluded that the number of alcohol outlets per inhabited area in sq km in the neighborhood and the number of people assisted by the Municipal Family Assistance Center per 1000 population in the neighborhood have the greatest impact on changes in the intensity of robbery crimes.

In the case of apartment burglary per 1000 population in the neighborhood, the regression model takes the following form:

$$y_4 = 0.211 + 0.011x_4 + 0.010x_8.$$

The conducted analysis shows that the spatial diversity of the intensity of apartment burglary is clearly influenced by two of the independent variables, which may partially explain the relatively small value of the coefficient of determination.

An increase in the number of alcohol outlets per average population in the neighborhood and the number of people assisted by the Municipal Family Assistance Center per 1000 population in the neighborhood result in an increase in the intensity of apartment burglary per 1000 population in the neighborhood.

From an analysis of the values of partial and semi-partial correlations coefficients, it can be concluded that both independent variables have a similar impact on the dependent variable.

In the case of theft of property per 1000 population in the neighborhood, the regression model takes the following form:

$$y_5 = 4.112 + 9.967x_4 + 0.105x_8 - 0.068x_{10}.$$

The conducted analysis shows that three of the independent variables have a clear impact on the spatial diversity of the intensity of the property theft analyzed here. Of these, an increase in the number of alcohol outlets per average population in the neighborhood and the number of people assisted by the Municipal Family Assistance Center per 1000 population in the neighborhood result in an increase in the number of thefts of property, while an increase in the share of green areas in the neighborhood has the opposite effect.

From an analysis of the values of partial and semi-partial correlations coefficients, it can be concluded that the number of alcohol outlets per average population in the neighborhood has greatest impact on changes in the intensity of the type of theft studied here.

In the case of property damage per 1000 population in the neighborhood, the regression model takes the following form:

$$y_8 = -2.704 + 0.073x_1 + 0.373x_3 + 0.988x_4 + 0.002x_7 - 0.036x_{11}.$$

The conducted analysis shows that as many as five independent variables have a clear impact on the spatial diversity of the intensity of property damage. An increase in population (in thousands) per 1 sq km of inhabited area in the neighborhood, number of unemployed per 1000 population in the neighborhood, number of alcohol outlets per average population in the neighborhood, total consumption expenses (in thousands PLN) per 1 person in the neighborhood result in an increase in the intensity of property damage, while the increase in the share of the area of single-family buildings in the area of buildings in total in the neighborhood has the opposite effect.

From an analysis of the values of partial and semi-partial correlations coefficients, it can be concluded that the number of unemployed per 1000 population in the neighborhood and the share of the area of single-family buildings in the area of buildings in total in the neighborhood have the greatest impact on changes in the intensity of property damage.

4. Summary and Discussion

This paper contributes to the literature on the interaction between various types of crime and socio-economic determinants at an intraurban scale. Among the ten dependent variables analyzed in neighborhoods for various types of crimes – namely, fights and battery, drug crimes, robbery crimes, apartment burglary, theft of property, commercial buildings burglary, burglary in other buildings, property damage, car theft, and car burglary – half met the assumed significance criteria of the regression model ($R^2 \geq 0.5$; p-level < 0.05; VIF < 5.0).

These criteria allowed for the identification of independent variables that determine the intensity of crimes in neighborhoods, specifically for drug crimes, robbery crimes, apartment burglary, theft of property, and property damage.

Socio-economic determinants exert a dual impact on the intensity of crime occurrence: they can either increase or decrease the number of crimes and have varying impact strengths, as determined by the values of partial and semi-partial correlation coefficients. Table 3 presents a summary of the intensity and strength of the impact of these variables."

The independent variable that most strongly influences the occurrence of crimes is the accessibility of alcohol outlets. Alcohol outlets per average population in neighborhoods (statistically significantly) affect four types of crimes (as detailed in Table 3), including drug crimes, apartment burglary, theft of property, and property damage.

However, in terms of alcohol outlets per area, neighborhoods predominantly impact robbery crimes. Collectively, these factors increase the intensity of all five types of crimes for which satisfactory regression models were established, with three types exhibiting increased intensity.

Similar results were reported in a study by Trangenstein *et al.* (2018), conducted in Baltimore City, which demonstrated that increased spatial access to alcohol outlets contributes to a rise in the number of violent crimes. Likewise, research by Speer *et al.* (1998) in Newark, NJ, found that the density of alcohol outlets was the single strongest predictor of violent crime.

Further supporting this positive correlation, studies by Cameron *et al.* (2012), Connor *et al.* (2011), Gorman *et al.* (2001), Gyimah-Brempong (2001), Livingston *et al.* (2007), Roman *et al.* (2009), Scribner *et al.* (1995), and Speer *et al.* (1998) have demonstrated similar results.

Additionally, research conducted in the North Island of New Zealand by Cameron *et al.* (2016) not only corroborated these findings but also recommended the need for political interventions to minimize crime by limiting the issuance of licenses for alcohol sales.

Another set of independent variables that significantly influences the spatial diversity of crime intensity, affecting more than one crime type, pertains to factors determining the population's financial situation (refer to Table 3).

The number of unemployed individuals per 1,000 residents in a neighborhood significantly escalates the intensity of property damage and, to a lesser extent, also contributes to an increase in the intensity of robbery crimes. Another influential factor is the total consumption expenses (in thousands PLN) per one person in the

neighborhood. This variable is associated with a rise in the number of robbery crimes and property damage.

Conversely, the independent variable related to receiving state social assistance — specifically, the number of individuals assisted by the Municipal Family Assistance Center per 1,000 residents — notably decreases the incidence of robbery crimes, while simultaneously leading to an increase in apartment burglaries and theft of property.

Research conducted in France and Great Britain by Jawadi *et al.* (2021) demonstrates that an increase in the unemployment rate leads to a rise in non-violent crimes. However, this study also indicates an escalation in the number of violent crimes, specifically robbery, and a significant increase in non-violent property damage.

Another study by Raphael and Winter-Ebmer (2001) links the decline in unemployment during the 1990s to a reduction in property crime in the United States, thus affirming the significance of unemployment as an indicator of property crime. A similar conclusion is drawn from research conducted in Swedish counties (Edmark, 2005), where unemployment was found to have positive and significant effects on the rates of burglary, car theft, and bike theft.

Research conducted by Hicks and Hicks (2014) revealed a strong correlation between visible consumption and violent crime, while finding no relationship with property crime. However, the authors did not exclude the possibility of such a relationship. Additionally, they discovered that visible consumption serves as a more potent signal to potential criminals than income does.

This study also identified an influence of consumption expenses on the overall crime rate, but it did not establish a relationship with disposable income. In contrast, our research corroborated the impact of consumption expenditure on violent crimes but yielded a slightly different outcome regarding property crimes, as we found a significant association between disposable income and an increased rate of property damage.

The government's budget for justice, aimed at reducing unfair income through social assistance, was studied by Wang and Hu in China (2022), and the research indicated a significant correlation with the overall crime rate. Conversely, research by Hannon and Defronzo (1998) in large metropolitan counties in the USA suggests that providing social assistance to the poorer segments of society is an effective method to reduce crime.

In our research, we found that state social assistance significantly decreases the number of violent crimes, specifically robbery crimes, but it concurrently increases

the incidence of non-violent crimes, such as apartment burglary and theft of property.

The group of independent variables that determines the quality of life in a neighborhood, influencing housing conditions and the surroundings of apartments, affects one type of crime. This group includes five independent variables (as listed in Table 3), three of which contribute to a reduction in crime intensity, the share of the area of single-family buildings in the area of buildings in total in the neighborhood significantly decreases property damage intensity, a smaller share of green areas in the neighborhood leads to a reduction in property theft, and the share of the area of hotel buildings in the area of buildings in total in the neighborhood lowers the incidence of drug crimes.

Conversely, two variables in this group increase crime intensity: the share of the area of office buildings in the area of buildings in total in the neighborhood elevates drug crime intensity; and a higher population (in thousands) per one sq km of inhabited area in the neighborhood increases property damage.

Research conducted by Hipp *et al.* (2019) demonstrates that areas with a higher concentration of detached single-family housing units are associated with reduced crime rates across all crime types. Similarly, the results from Greenberg *et al.* (1982), despite being from descriptive studies without further analysis, also support this thesis.

In the areas they analyzed, which predominantly consisted of single-family houses, the prohibition of commercial buildings — including potential crime attractors such as alcohol outlets or pawn shops — was observed. In our research, areas with single-family houses significantly lowered the level of property damage, although they had no discernible effect on the other types of crimes we analyzed.

Numerous studies conducted by various researchers also confirm that green spaces contribute to reducing the level of crime in cities. This is evidenced by studies carried out in diverse locations, including Toronto, Canada (Onifade, 2020), Brisbane, Australia (Kimpton et al., 2017), New Haven, USA (Gilstad-Hayden *et al.,* 2015), Tehran, Iran (Ambrey and Shahni, 2017), metropolitan areas in Indonesia (Sukartini *et al.,* 2021), and cities in South Africa (Venter *et al.,* 2022).

Hotel buildings are classified as risky facilities (Eck *et al.,* 2007). While most research results suggest that hotel buildings contribute to an increase in crime density in their surroundings (Sun *et al.,* 2022) and on the plots on which they are located (Bowen *et al.,* 2022), with a significant number of property-related crimes committed within the hotel buildings themselves (Huang *et al.,* 1998), our research did not confirm these findings. Instead, we obtained a contrasting result, indicating that hotel buildings reduce the rate of drug-related crimes in the neighborhood.

However, we did not find any significant impact of hotel buildings on rates of property crimes or violent crimes.

Research conducted by Bowen *et al.* (2022) indicates that office buildings are among the top 25 parcels experiencing the highest levels of violent crime. However, the immediate vicinity of these office buildings does not record a high number of violent crimes (20 crimes at the parcel level), while within a 400-meter buffer zone around them, the number is almost seven times higher (136 incidents).

Our research demonstrates that the presence of office buildings has a noticeable impact throughout the neighborhood, contributing to an increase in the intensity of drug-related crimes.

Numerous studies support the thesis that an increase in population density correlates with a rise in crime rates (Hanley *et al.,* 2016; Wang and Hu, 2022; Yang *et al.,* 2019). Stark (1987) posits that high population density is a critical factor influencing neighborhood-level crime, alongside poverty, mixed land use, transience, and dilapidation, in his theory of deviant neighborhoods.

Our research corroborates this in terms of the property damage rate in neighborhoods. However, some studies challenge this thesis (Chamlin and Cochran, 2004; Rotolo and Tittle, 2006).

Table 3. *The strength and direction of the influence of independent variables*

Dependent variables	Independent variables									
	x1	**x3**	**x4**	**x5**	**x7**	**x8**	**x10**	**x11**	**x13**	**x14**
y2			↑↑						↓	↑
y3		↑		↑↑	↑	↓↓				
y4			↑			↑				
y5			↑↑			↑	↓			
y8	↑	↑↑	↑		↑			↓↓		

Note: *Explanation: (a) ↑ means that the variable increases the intensity of crime; ↑↑ significantly increases crime intensity (b) ↓ means the variable reduces the intensity of crime; ↑↑ significantly reduces the intensity of crime.*
Source: *Own study.*

5. Conclusions

The results obtained in this study allowed to confirm the research hypotheses: (1) The prevalence of crime is influenced by a range of socio-economic determinants. (2) Various categories of crime are influenced by distinct socio-economic variables. The incidence of property damage and robbery is predominantly influenced by a spectrum of socio-economic variables.

The research results facilitate the formulation of several recommendations for policymakers aimed at crime prevention and reduction:

(a) Policymakers are advised to give special attention to alcohol outlets, as they significantly influence various types of crimes, including violent ones.

(b) Unemployment, as a social phenomenon, substantially impacts crime rates. Initiatives focused on the professional activation of unemployed individuals can effectively limit property damage and violent crimes, such as robbery.

(c) The form of social assistance for the most impoverished should be re-evaluated, considering that the current approach contributes to an increase in two types of crimes (Apartment burglary and Theft of property).

(d) Green areas are correlated with lower property theft rates, justifying the planning of new green spaces and urban greening initiatives.

(e) Areas with single-family houses are observed to significantly reduce the property damage rate.

(f) Increased population density is associated with a rise in property damage, suggesting that the current trend towards denser urban fabric and development intensification should be re-examined.

The appropriate shaping of social policy, coupled with strategic spatial planning and development, are potent tools for reducing crime rates and enhancing safety levels in urban areas.

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