

Mapping global and economic crime in Romania. Regional trends and patterns

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Abstract: *Although many recent studies have approached the topic of economic crime, with a focus on corruption and bribery, the regional dimension of the phenomenon is still under researched. This paper employs a variety of statistical methods, from descriptive statistics to convergence and spatial econometrics, in an attempt to explore global and economic crime in Romania, at county level, over 1990-2014 period. The analysis revealed that developed counties tend to have higher criminality rates, with Ilfov County and Bucharest Municipality frequently on top, and the county rankings are relatively stable in the short run. Against expectations, the regression models that have been estimated could not provide enough support for the variable GDPper capita (proxy for development level) as a statistically significant factor of influence on criminality rate in all years, but the explanatory variable “criminality rate in previous year” proved to be positive and highly significant in all models, indicating the relative inertia of this phenomenon.*

Keywords: *economic crime, spatial model, county, Romania*

JEL Classification: *R19, C54*

Introduction

Following the collapse of socialism, Romania has undergone major politic, social and economic changes, the demise of the totalitarian regime enabling a surge in criminal activity, in general, and economic crime, in special.

Economic crime has various forms, such as misappropriation of assets, bribery, procurement and accounting frauds and, more recently, cyber-crime which has been in a rapid

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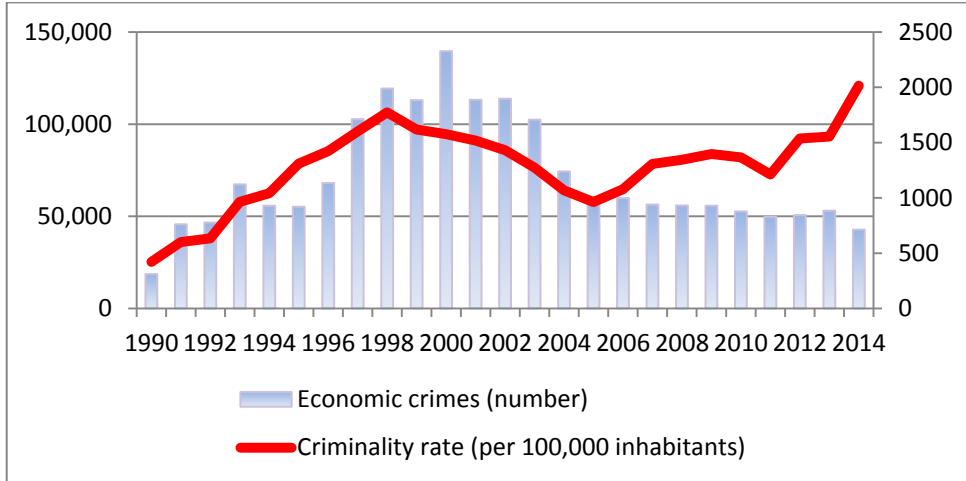
ascending trend in the last years, surpassing most of the “classic” types of economic crime (Global Economic Crime Survey, 2016). Traditional criminal organizations are more refined nowadays, becoming transnational, over-specialized and very sophisticated, sharing markets and spheres of influence, and using all the advantages of globalization: disappearance of internal borders, industrialization, development of commercial transactions, payments via the Internet in real time. Additional favorable factors have been the expansion of shadow economy, poverty, and the weakening of state power in controlling crime (Leția, 2014).

Although its long-term direct and indirect effects can be devastating for a whole nation, the reaction of the society towards business crime is low as compared the response to classic forms of crime (Moldoveanu, 1999). Economic crime takes place in the context of economic world, in business and finance, using methods and means which do not appeal to physical force and violence and therefore are perceived as less threatening for the individual.

Corruption and bribery lately attracted a lot of interest in Romania, in the context of increased efforts undertaken by the National Integrity Agency and the National Anti-corruption Directorate to fight widespread corruption, especially high-level corruption (Romanian Ministry of Justice, 2016b). The total number of economic crimes seem to have leveled in the last decade (although their economic and social impact is increasing), while the general criminality rate (total number of crimes per 100,000 inhabitants) was in a steep ascending trend in the same period (Figure 1). The Romanian National Anticorruption Strategy 2012-2015, which has been extended for two more years (Romanian Government, 2016) under the coordination of the Ministry of Justice, achieved many of its general and specific goals, but economic crime prevention is still unsatisfactory (Romanian Ministry of Justice, 2016a).

In the last decade many scholars have explored the topic of economic malfeasance, with a focus on corruption and bribery (e.g. Profiroiu *et al.*, 2006; Andrei, 2007; Matei and Matei, 2009; Andrei *et al.*, 2010; Miron *et al.*, 2011; Sabău, 2013) but its regional dimension is still under research because information is scarce. Given “the lack of motivation of many units of the local public administration to invest resources in anti-corruption activities” (Romanian Ministry of Justice, 2016a, p.4) there are significant regional differences in economic crime levels. Consequently, for an accurate picture of the phenomenon, it is important to add the regional perspective to the previous studies on criminal activity, as global (national) data can hide the spatial inequalities.

Figure 1. The number of economic crimes and the general criminality rate in Romania, 1990-2014



Source: Own processing.

In this context I engage in various empirical investigations based on statistical methods adapted to the regional scale of the analysis, seeking to substantiate the regional picture of criminal activity in Romania. The rationale of this research is the need to explore the territorial variation and trends in global and economic crime in Romania in order to offer policy-makers useful data for an informed decision. By reaching a spatial insight into this topic I fill a gap in the existing literature on illegal activity in Romania. I also seek to raise awareness on the region-specific challenges of the current national fight against corruption, bribery, money laundering, etc.

Literature review

Crime represents an umbrella concept encompassing a wide range of law-breaking forms. Among them the economic crime ("white collar" crime) is considered more complex, dangerous and far-reaching compared to other delinquencies. In practice, the concept of economic crime include various acts: theft, fraud, embezzlement, distortion of data, industrial sabotage, computer fraud, forgery, counterfeiting, data hiding, documents destruction, giving and taking bribe, corruption, money laundering, tax evasion, crimes relating to accounting documents, fake bids in public procurement procedures, etc. (Leția, 2014).

Economic crime is a breach of trust, speculating the trust of the participants in economic life, the credibility and apparent stability of the financial, commercial or banking circuit.

The damages caused by this form of crime are not only economic, but also patrimonial: less confidence in the power of the state to manage public money, to provide a stable economic and financial environment, to ensure compliance with principles such as equality before the law, fairness, etc. (Leția, 2014).

Economic crime takes the form of professional criminality, characterized by the fact that those who practice this activity as constant occupation and main source of income require specialized knowledge. Such professional economic criminals, so-called "white collars", are often people who enjoy a high social position, holding management jobs (Bujor and Bejan, 1999).

Only a few studies undertaken in Romania have targeted topics such as the amplitude, causes and effects of economic crimes and the appropriate strategies to fight them. Given that corruption and bribery are the most common forms of economic crime in Romania, many studies approached them focusing mostly on public administration sector (Profiroiu *et al.*, 2006; Andrei, 2007; Matei and Matei, 2009; Andrei *et al.*, 2009 and 2010), as well as on public healthcare (Matei and Matei, 2009; Andrei *et al.*, 2010), academic behavior (Teodorescu, 2006 and 2007; Andrei *et al.*, 2010), businesses' fraud risk (Sabău, 2013), unethical business practices (Miron *et al.*, 2011).

Earlier studies stressed that the companies activating in Romania were not stimulated to comply with the legal requirements given the corruption of the state, insufficient regulations in financial and commercial sectors and the weak enforcement of the law (Ghitescu and Banciu, 2001). The situation started to improve following the establishing of the National Anti-corruption Directorate (DNA) in 2002 and the implementation of the Romanian National Anticorruption Strategies 2001-2004, 2005-2007, 2008-2010 and 2012-2015 (Romanian Ministry of Justice, 2016b).

The confused, uncoordinated and ambiguous legal framework has been singled out as the main enabler of economic crime in Romania (Ghitescu and Banciu, 2001). Another major problem was the inability of public institutions to fight economic crimes because they lacked experience, resources, and incentives or were merely corrupt.

Economic crime has large social and financial impact. For instance, during the transition to the market economy, fraudulent loaning schemes, frequent between 1990 and 1995, created a dangerous situation in the national banking system and some big banks went bankrupt (Dacia Felix, Bancorex, etc.), while pyramidal schemes (e.g. Caritas) led to significant social and financial crises until their abolishment in 1994. Other popular forms of economic crime in Romania have been fraudulent privatizations, various ways to avoid taxes (e.g. by recording false expenses in companies' ledgers, illegal VAT recovery related to inexistent export, etc.) illegal tenders, money laundering, traffic with alcohol and cigarettes, counterfeiting, etc. (Ghitescu and Banciu, 2001). Using

aggregate data for the period from 1990 to 2010, Manole and Erdnic (2012) found that the number of economic offences had significant negative effects on Romanian economic growth.

Matei and Matei (2009) investigated the effectiveness of strategies against corruption with a special focus on public administration and healthcare. In line with the mainstream literature, the authors stress that the goal should be achieving an “optimal level of corruption” given that this phenomenon is unlikely to be ever completely eradicated.

Many of the past studies used own questionnaires to collect data for empirical analysis. For instance, Andrei *et al.* (2010), using a representative sample, estimated the level and effects of corruption in some relevant sectors of the economy: education, health, politics, local public administration, and central public administration and found that corruption in the public sector is perceived as the highest, the respondents indicating the low wages as main reason. Profiroiu *et al.* (2006) tried to assess if more decentralized public administration and better local governance could significantly curb corruption on a short and medium time horizon. They used data collected through a statistical survey of local mayors and the questionnaire captures their perception of a variety of topics related to the reform of public administration and the corruption issue. The respondents indicated the low transparency of the decision-making process as the main enabler of local corruption and the need to modernize public administration as a solution to it. A similar analysis on the same dataset was conducted by Teodorescu *et al.* (2007).

Romania is currently included in periodic international research on economic crime (e.g. Global Economic Crime Surveys, assessment of corruption perception by Transparency International, etc.), but these studies are not entirely reliable because they draw on small samples of economic agents and the research design relies heavily on questionnaires which reflect the subjective perceptions and beliefs of the respondents. For instance, it is surprising that in 2009 Romania was credited with one of the lowest levels of economic crime, according to a survey by PriceWaterhouseCoopers (Global Economic Crime Survey, 2010) that placed Romania on the 50th position out of 54 countries, while only 16% of Romanian respondents reported fraud in the last 12 months, compared to a global average of 30%.

The level of 2015 Corruption Perceptions Index published by Transparency International was 46 for Romania, an improvement compared to 43 in the previous three years (the scoring ranks from 0 - meaning that a country is perceived as highly corrupt, to 100 – meaning no corruption at all). Nevertheless, the international ranking is worse, Romania advancing in 2015 to the 58th place on the corruption scale (out of the 168 countries under survey), compared to the 69th place in 2001.

Internationally, asset misappropriation accounted for 64% of the total number of economic crimes in 2015, followed by cybercrime (32%) and bribery and corruption (24%), but in CEE countries, including Romania, bribery and corruption are prevalent (Global Economic Crime Survey, 2016).

In brief, past studies on economic crime in Romania confronted questions of economic crime level in different sectors, main factors of influence, effects, measures to prevent this phenomenon, etc., but the regional perspective is, to our knowledge, completely lacking from previous research.

Methodology and data

This paper undertakes a county-level research on criminal activity in Romania using specific methods of spatial analysis, in addition to descriptive statistics and classic regression models.

Firstly, I analyze the long-run evolution of territorial differences in criminality rate (relative to the population) based on individual county rankings for each year of the period 1990 to 2014, focusing on the extreme values. In this context, I measure the annual territorial dispersion of criminality rate using the sigma convergence indicator introduced by Barro and Sala-i-Martin (1995). Sigma convergence captures the overall dispersion of criminality rate (CR_i) among counties, as follows:

$$\sigma = \frac{\sqrt{\frac{\sum_{i=1}^n (CR_i - \overline{CR})^2}{n}}}{\overline{CR}}, \quad (1)$$

where n is the number of counties.

A decreasing trend in σ values indicates convergence, while the opposite means divergence.

Secondly, a classic regression model is employed for estimating the influence of regional development (proxied by GDP per capita) on criminal activity in Romania. The model includes a one-year lag ($CR_{i,t-1}$) of the dependent variable criminality rate ($CR_{i,t}$) in order to account for the likely inertia (influence of the previous law-breaking scale in county i) of this phenomenon:

$$CR_{i,t} = a + b \cdot CR_{i,t-1} + c \cdot GDP_{i,t} + \varepsilon \quad (2)$$

From an econometric perspective, the time lag in our model specification captures the influence of the factors of influence that are not included in the model and improves the estimation.

Considering that neighboring regions often tend to share common characteristics, I test for spatial dependence in criminal activity by employing Moran's I indicator (Anselin and Rey, 1991):

$$MI = \frac{n \sum_{i=1}^n \sum_{j=1}^n w_{ij} (x_i - \bar{x})(x_j - \bar{x})}{\left(\sum_{i=1}^n \sum_{j=1}^n w_{ij} \right) \sum_{i=1}^n (x_i - \bar{x})^2} \quad (3)$$

Where: x_i and x_j represent the values of the criminality rate in the regions i and j , respectively, \bar{x} is the average (national) criminality rate, and w_{ij} represent spatial weights capturing the "spatial influence" between county j and county i . In this paper I use a first-order queen contiguity matrix, *i.e.* $w_{ij} = 1$ if regions i and j are neighbours and $w_{ij} = 0$ otherwise. Moreover, I apply a permutation test to check if the computed value of Moran's I is statistically significant (Anselin and Rey, 1991).

Following the mainstream spatial econometrics literature, spatial dependence (if significant) is corrected using spatial models (Anselin, 2005; LeSage and Pace, 2009). The spatial autoregressive model includes the spatial lag of the dependent variable ($\rho \cdot W \cdot CR_{i,t}$) in the previous classic model specification:

$$CR_{i,t} = a + b \cdot CR_{i,t-1} + c \cdot GDP_{i,t} + \rho \cdot W \cdot CR_{i,t} + \varepsilon \quad (4)$$

while the spatial error model accounts for spatial dependence in the error term, as follows:

$$CR_{i,t} = a + b \cdot CR_{i,t-1} + c \cdot GDP_{i,t} + (\lambda W\varepsilon + \nu). \quad (5)$$

I finally choose the appropriate model for our data according to the value of Lagrange multiplier test.

The analysis of global criminality covers the interval 1990 - 2014, but the econometric models will be estimated only from 1995 to 2013 (annually), since this is the longest period for which official statistics on regional GDP are currently available. Data for analysis come from the Romanian Institute of National Statistics TEMPO database, and own computations of per capita values of the variables. As regional data on economic crimes is missing from the official statistics, the analysis relies mainly on spatial data on global crime. Since this category includes economic crime, it is reasonable to expect them to share similar regional patterns. Moreover, empirical studies at aggregate level suggest that the evolution of different main crimes tends to correlate in time (e.g. Manole and Erdinc, 2012).

Results and discussion

The county rankings have been established for each year between 1990 to 2014 based on county official data on criminality rate (total number of criminal offences per 100,000 inhabitants) presented in Appendix. Table 1 illustrates the extremes by featuring the top 5 and bottom 5 counties according to the annual values of criminality rate.

Table 1: Highest and lowest county levels of criminality rate, 1990-2014

	Top 5 counties	Bottom 5 counties
1990	Ilfov, Bucharest Municipality, Satu Mare, Brăila, Galați	Harghita, Argeș, Suceava, Sălaj, Vâlcea
1991	Ilfov, Brăila, Timiș, Mehedinți, Bucharest Municipality	Suceava, Harghita, Neamț, Dâmbovița, Sălaj
1992	Ilfov, Timiș, Brăila, Hunedoara, Mehedinți	Harghita, Suceava, Brașov, Argeș, Vâlcea
1993	Ilfov, Mehedinți, Constanța, Hunedoara, Bacău	Argeș, Vâlcea, Neamț, Brașov, Suceava
1994	Ilfov, Mehedinți, Hunedoara, Giurgiu, Timiș	Neamț, Argeș, Brașov, Vâlcea, Tulcea
1995	Ilfov, Mehedinți, Dolj, Iași, Bihor	Argeș, Neamț, Vrancea, Sălaj, Vâlcea
1996	Hunedoara, Ilfov, Mehedinți, Timiș, Giurgiu	Argeș, Neamț, Sălaj, Vâlcea, Maramureș

	Top 5 counties	Bottom 5 counties
1997	Ilfov, Hunedoara, Mehedinți, Bacău, Timiș	Maramureș, Vâlcea, Argeș, Neamț, Sălaj
1998	Ilfov, Mehedinți, Covasna, Alba, Hunedoara	Maramureș, Sălaj, Neamț, Vâlcea, Vrancea
1999	Ilfov, Mehedinți, Dolj, Covasna, Gorj	Vâlcea, Sălaj, Cluj, Maramureș, Neamț
2000	Ilfov, Mehedinți, Tulcea, Brașov, Covasna	Sălaj, Cluj, Maramureș, Neamț, Argeș
2001	Ilfov, Covasna, Gorj, Vrancea, Brașov	Sălaj, Cluj, Neamț, Maramureș, Teleorman
2002	Ilfov, Alba, Bacău, Gorj, Bucharest Municipality	Sălaj, Bihor, Maramureș, Giurgiu, Prahova
2003	Gorj, Ilfov, Alba, Hunedoara, Bacău	Vâlcea, Bihor, Sălaj, Prahova, Giurgiu
2004	Gorj, Covasna, Hunedoara, Alba, Dâmbovița	Vâlcea, Bihor, Prahova, Timiș, Brăila
2005	Hunedoara, Neamț, Harghita, Gorj, Calarași	Vâlcea, Galați, Argeș, Timiș, Bihor
2006	Hunedoara, Harghita, Bucharest Municipality, Olt, Ilfov	Vâlcea, Argeș, Prahova, Bihor, Galați
2007	Hunedoara, Alba, Gorj, Olt, Calarași	Brăila, Prahova, Ilfov, Bistrița-Năsăud, Buzău
2008	Hunedoara, Alba, Gorj, Olt, Mureș	Ilfov, Covasna, Galați, Botosani, Bihor
2009	Hunedoara, Gorj, Alba, Olt, Calarași	Ilfov, Galați, Botosani, Iași, Brăila
2010	Hunedoara, Alba, Gorj, Giurgiu, Mureș	Ilfov, Galați, Teleorman, Suceava, Iași
2011	Hunedoara, Brașov, Harghita, Alba, Tulcea	Ilfov, Teleorman, Vâlcea, Calarași, Iași
2012	Tulcea, Hunedoara, Constanța, Bucharest Municipality, Brașov	Teleorman, Bihor, Buzău, Maramureș, Covasna
2013	Constanța, Hunedoara, Alba, Bucharest Municipality, Vaslui	Teleorman, Bihor, Covasna, Galați, Bistrița-Năsăud
2014	Bucharest Municipality, Hunedoara, Brașov, Mureș	Olt, Covasna, Teleorman, Gorj, Arad

Source: Processed by the author.

Although county ranking changes in time, there has been some stability in the short run. For instance, the Ilfov County has constantly been on the top position from 1990 until 2002, having the highest number of criminal offences relative to its population. From 2003, the Ilfov County gradually moved to lower positions, reaching the bottom group of the scale between 2007 and 2011. Similarly, the Timiș County moved from high to low ranking, while the Brașov County followed an opposite trend, from low to high criminality rate. The Bucharest Municipality, on the other hand, displayed a more stable position, belonging to the top 5 counties for most of the period under investigation. Other counties frequently positioned in the top criminality group are: Hunedoara, Alba, Gorj

and Ilt. The relative stability in the top group of counties suggests that some local factors of influence have acted steadily, keeping the criminality rate quite high in these counties.

A common denominator of many counties in top 5 seems to a higher than average development level, but there are also some exceptions. At the opposite end of the distribution, the lowest values of the criminality rate can be found in Teleorman, Vâlcea, Sălaj, Bihor and Neamț.

The general pattern in territorial malfeasance seems to be one of higher criminality in richer counties, despite some temporary exceptions, such as the well-developed Ilfov, Timiș and Brașov counties displaying small levels of criminality rate in some years, or the less-developed Tulcea, Harghita and Covasna counties belonging to the top group of criminality rate for short periods of time.

In order to check for territorial similarities/dissimilarities in illegal activity among neighbor counties, I first tested for spatial autocorrelation in the values of the criminality rate at county (NUTS 3) level. The Moran's I statistic displays positive and significant values for most years (Table 2), indicating that counties having similar (high/low) intensity of criminal activity tend to cluster. This means that there are larger zones (including several neighboring counties) having common law-breaking patterns. Such a spatial design is suggestive for similar factors of influence acting not only in a certain region but also in a larger zone in its neighborhood.

Table 2: Diagnostics for spatial dependence of criminality rate in Romania (Moran index)

Year	Moran's I			
	Index (pseudo p-value)	Mean	S.D.	Z-Value
1990	0.2509 (0.0010)	-0.0303	0.0735	3.825
1991	0.2085 (0.0070)	-0.0231	0.0843	2.7483
1992	0.1829 (0.0150)	-0.0268	0.0855	2.4529
1993	0.1026 (0.0620)	-0.0217	0.0803	1.5471
1994	0.1675 (0.0160)	-0.0276	0.0885	2.2034
1995	0.1348 (0.0430)	-0.0299	0.0894	1.8435
1996	0.1503 (0.0340)	-0.0277	0.0912	1.9513
1997	0.0875 (0.1050)	-0.0234	0.0861	1.2883
1998	0.0968 (0.0860)	-0.0226	0.0922	1.2963
1999	0.1557 (0.0270)	-0.0244	0.0900	2.0633

Year	Moran's I			
	Index (pseudo p-value)	Mean	S.D.	Z-Value
2000	0.2664 (0.0040)	-0.0236	0.0981	2.9555
2001	0.2641 (0.0050)	-0.0218	0.0930	2.8801
2002	0.19472 (0.0230)	-0.0255	0.0957	2.3001
2003	0.0683 (0.1810)	-0.0244	0.0944	0.9305
2004	-0.0818 (0.2700)	-0.0218	0.0973	-0.6168
2005	-0.0832 (0.2830)	-0.0229	0.0979	-0.6157
2006	-0.0577 (0.3830)	-0.0255	0.0983	-0.3278
2007	0.0996 (0.1020)	-0.0291	0.0966	1.3322
2008	0.1837 (0.0310)	-0.0206	0.0963	2.1208
2009	0.2347 (0.0080)	-0.0230	0.0941	2.7395
2010	0.2054 (0.0100)	-0.0244	0.0916	2.5090
2011	-0.0973 (0.2290)	-0.0239	0.0951	-0.7723
2012	0.0551 (0.1870)	-0.0256	0.0979	0.8246
2013	0.0883 (0.1130)	-0.0251	0.0945	1.2007
2014	0.1343 (0.0520)	-0.0244	0.0975	1.6695

Source: Author's computations in Open Geoda.

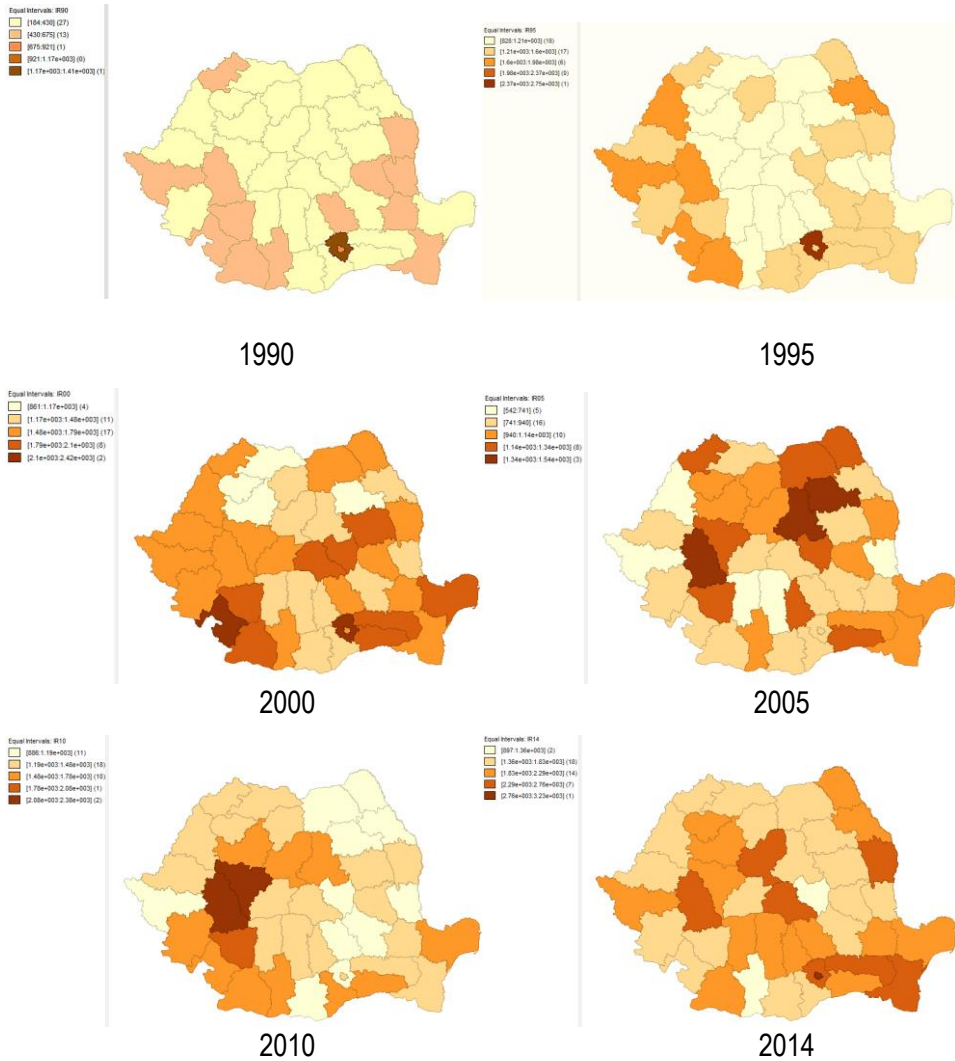
The maps in Figure 2 illustrate the values of criminality rate by county, in selected years, confirming that low/high values of this indicator tend to cluster. This territorial pattern is specific to positive spatial dependence (neighborhood similarity). Like the annual county rankings in Table 1, the maps reveal sizeable differences in time and space, the highest/lowest values changing location across the country. It is also visible on the maps that high/low values tend to cluster, but these clusters are not stable in time.

The Western part of the country and the Bucharest-Ilfov region seem to monopolize the highest criminality rates for most years of the period. This spatial design suggests a positive correlation between development and criminality.

In the last year of the interval under investigation the criminality levels display a more dispersed territorial picture, with high values recorded in at least one county from almost all regions of the country (Figure 2-2014).

Figure 2. Criminality rate by county, selected years

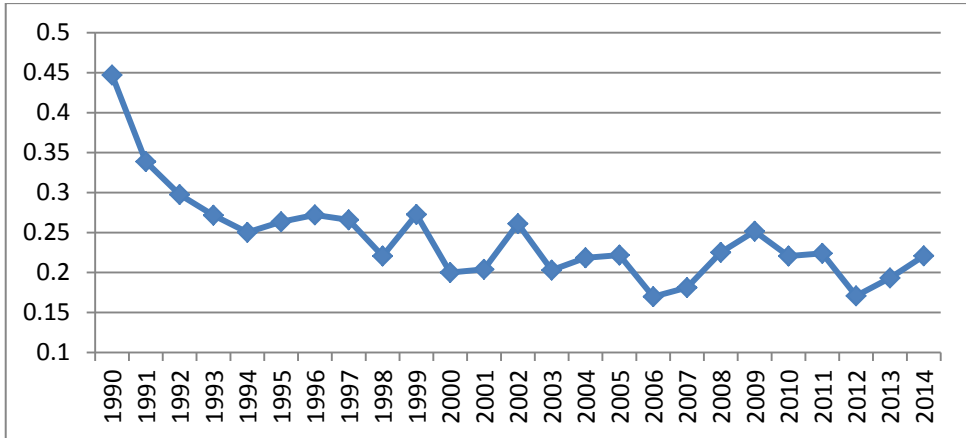




Source: Own processing in Open Geoda.

The sigma convergence indicator displayed in Figure 3 shows a significant drop in spatial dispersion of the criminality rate during the first years of transition to market economy. It is worth mentioning that this decline in inter-county differences occurred in the context of an overall rise in criminal offences throughout the country. Since 1995 the sigma convergence indicator has varied less, remaining within a limited range of values (0.16 to 0.26), suggesting that the spatial variation in criminal activity tends to stabilize.

**Figure 3. Dispersion of criminality rate among counties
(sigma convergence), 1990-2014**



Source: Own processing.

The analysis went on with the annual regressions on criminality rate in relation to the development level captured by GDP per capita. Due to limited official statistics on regional GDP, the econometric models have been estimated from 1995 to 2013, the longest period for which data are currently available. The results (Table 3) show what the variable “criminality rate in previous year” is positive and highly significant (as expected) in every year of the 1995-2013 period, indicating a relative inertia of the phenomenon. This suggests that past values of criminality in a county is the best forecast variable for its future levels.

Although preliminary statistical analysis of the data suggested a positive link between the criminality rate in a county and its development level, statistical tests related to the annual regression models revealed that the variable GDP per capita statistically significant only in four years: 2001, 2004, 2006 and 2012 (Table 3). This result, which is against our expectations, shows the need to test additional explanatory variables in the models. Depending on the availability of data, it would also be better to break down the dependent variable “criminality rate” into relevant components (main types of offences) that might have divergent trends.

**Table 3: Results from the annual regression models
(dependent variable: criminality rate)**

Year	Coefficient (prob)	Adjusted	F-statistic
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	Constant	Criminality rate in previous year	GDP per capita	d R-squared	(prob)
1995	60.410 (0.7503)	1.1300 (0.0000)	0.1956 (0.6815)	0.7217	54.157 (0.000)
1996	302.010 (0.1863)	0.9169 (0.0000)	-0.1664 (0.7636)	0.6476	38.681 (0.0000)
1997	51.0375 (0.7697)	0.9938 (0.0000)	0.4383 (0.3102)	0.8238	91.190 (0.0000)
1998	428.009 (0.0117)	0.7939 (0.0000)	0.2531 (0.5618)	0.7612	62.153 (0.0000)
1999	-91.786 (0.6048)	1.0161 (0.0000)	-0.2813 (0.4967)	0.7988	77.440 (0.0000)
2000	534.935 (0.0000)	0.6086 (0.0000)	0.1645 (0.5548)	0.7368	54.577 (0.0000)
2001	36.0789 (0.7924)	0.7994 (0.0000)	0.6684 (0.0164)	0.7664	63.995 (0.0000)
2002	-228.612 (0.1038)	1.0641 (0.0000)	0.1331 (0.6190)	0.8038	79.904 (0.0000)
2003	492.858 (0.0000)	0.6226 (0.0000)	-0.2904 (0.1637)	0.7396	55.385 (0.0000)
2004	394.255 (0.0029)	0.7288 (0.0000)	0.6102 (0.0033)	0.6294	33.115 (0.0000)
2005	239.008 (0.0406)	0.7356 (0.0000)	-0.1571 (0.2431)	0.6855	42.513 (0.0000)
2006	187.117 (0.0666)	0.7117 (0.0000)	0.4396 (0.0001)	0.6868	42.774 (0.0000)
2007*	519.903 (0.0021)	0.8182 (0.0000)	-0.2009 (0.2472)	0.4644	-
2008	-204.726 (0.0835)	1.1778 (0.0000)	0.0148 (0.8746)	0.8475	108.41 (0.0000)
2009	30.827 (0.7986)	1.0574 (0.0000)	-0.0506 (0.6931)	0.8304	95.482 (0.0000)
2010	339.723 (0.0039)	0.7524 (0.0000)	-0.0396 (0.7587)	0.7588	65.485 (0.0000)
2011	395.420 (0.0282)	0.5948 (0.0000)	-0.0164 (0.9270)	0.4359	15.068 (0.0000)
2012	621.381 (0.0005)	0.5600 (0.0000)	0.4494 (0.0101)	0.4378	15.187 (0.0000)
2013	-44.0718 (0.7125)	1.0103 (0.0000)	0.0777 (0.4834)	0.8197	88.655 (0.0000)

* Spatial Error Model (Maximum Likelihood estimation) for 2007; classic regression (OLS estimation) for all other years.

The annual econometric models are all statistically valid and the independent variables, except for a few years, explain most (between 65% and 85%) of the spatial variation in the dependent variable "criminality rate". Despite significant spatial dependence

revealed by Moran's I, classic regression proved to be a better fit for the data, apart for the year 2007, where a Spatial Error Model was chosen based on the indication of the Lagrange multiplier test.

Conclusions

In this paper the territorial patterns of criminal offences in Romania have been explored over the 1990-2014 period by means of appropriate spatial analysis techniques. The data showed that the Western part of the country and the Bucharest-Ilfov region recorded the biggest criminality rates for most of the period under investigation. The statistic analysis suggested a positive link between the criminality rate in a county and its development level, but the annual regression models could not provide support for the variable GDP per capita as a statistically significant factor of influence on criminality rate (except for a few years) and new explanatory variables should be tested in future research. On the contrary, the explanatory variable "criminality rate in previous year" proved to be positive and highly significant in all models, indicating a relative inertia of the phenomenon. It seems that recent levels of criminality in a county represent the best forecast.

Given the lack of territorial data on economic crimes in the Romanian official statistics, the analysis focused on spatial data regarding global crime. Since this category includes economic crime, they should share similar regional patterns, as indicated in some empirical studies. Amid rising widespread criminal offences, the differences between counties fell off and a sigma convergence process in criminality rate took place. The relative stability in the group of counties having the highest levels of criminal offences suggests the presence of constant local factors of influence that need to be addressed by the appropriate decision makers. The scale of this phenomenon and the risks involved in relation to law enforcement, national budgets, decreasing public confidence in the rule of law, etc. require new complex and effective forms of prevention, fighting, investigating and sanctioning business crimes. Failure in reducing economic crimes and alleviating their negative effects endangers the development of a healthy economy and society.

More effective measures should be taken for discouraging economic crimes, strengthening the mechanisms for law enforcement, raising public awareness as regards the risks that emerge from economic offences. Such measures should be disseminated through various means including social media, so as more individuals do take a resolute stand against corruption. The anti-corruption strategy needs to be more inclusive, involving the population at large and the focus on corruption prevention and countering it in its early stages.

A critical role in the detection, prevention and combating of crime in business is played by investigation entities. For instance, the role of investigative journalists in detecting corruption, fraud, etc is well known. There is a need to increase the effectiveness of the local investigation instruments, within the national legal system, taking into account that having a set of appropriate and specific tools and using special investigative techniques can improve the efforts in fighting economic crime.

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