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**Interrelationships between Violent crime, demographic
and socioeconomic factors:
A preliminary analysis between Central-Northern
European countries and Mediterranean countries**

By Matteo BELLITTO ^a & Mario COCCIA ^{b†}

Abstract. The paper here investigates possible relationships between violent crime, migration and unemployment. Results seem to show an association between some crimes - such as theft, assaults and sexual violence- and immigration but not between intentional homicides and immigration. Preliminary evidence also suggests that intentional homicides are associated with high rates of unemployment, linking this violent crime to socioeconomic and situational factors within countries. In addition, unlike commonplace opinions, statistical evidence here reveals that rich countries have levels of violent crime higher than poor countries. Especially, violent crime in central-northern European regions (geo-economic areas with high GDP per capita, e.g., Germany, Finland, Norway, etc.) is higher than Mediterranean countries with lower GDP per capita (e.g., Greece, Italy, Spain, etc.). These conclusions are of course tentative. There is need for much more detailed research into the relations between unemployment, immigration and violent crime to explain general causes of these social issues in modern economies. This study concludes with some socioeconomic implications and explanations.

Keywords. Violent crime, Violence, Theft, Sexual violence, Intentional homicides, Immigrants, Migration, Unemployment, Europe, Poverty, Mediterranean countries.

JEL. C10, I30, J10, J11, J15, J20, J60, J61, J62, O15.

1. Introduction

Economic growth of countries in modern economies depends on manifold factors, such as evolution of new technology, low government debt, R&D investments and efficient public research organizations (Acemoglu *et al.*, 2008; Coccia, 2010e, 2013, 2014a, 2016, 2017a, 2017n, 2018; Coccia & Bozeman, 2016; Coccia & Rolfo, 2009, 2010, 2013, Coccia & Wang, 2015, 2016)¹. Dynamics of population and immigration also play a vital role for a sustainable socioeconomic growth of modern nations (Sabbatucci & Vidotto, 2008; Coccia, 2012b). In Europe, in the last two decades, migration flows from poor countries have intensified due to social frictions within African and/or Middle Eastern societies (Hugo, 2005). This phenomenon has generated reflections on the role and impact that migration flows can have on host societies (e.g., European countries), their economies and crime (cf., Coccia, 2017). Current political debate, in the presence of international terrorism, has highlighted its centrality for well-being and security of host societies (Barone *et al.*, 2016; cf., Coccia, 2018a, 2018b). In fact,

^a CNR, National Research Council of Italy, Italy.

☎. 886-7-7310606 ext. 5132

✉. matteo.bellitto@gmail.com

^{b†} Arizona State University, Interdisciplinary Science and Technology Building 1 (ISBT1) 550 E. Orange Street, Tempe- AZ 85287-4804 USA.

☎. + 85287-4804

✉. mario.coccia@cnr.it

contemporary societies are fluid and - in contrast to the mobility policies within the European Union (EU) - a growing mistrust has developed towards immigration (Hugo, 2005). Immigration also involves the problem of integration that means the entering of the individual within a community through the socialization process. In Europe, deviant social phenomena, such as crime, throw light on the flaws of a complex process like the latter one. Moreover, in societies with a high level of division of labor, integration is achieved through the formal adherence of its members to the principles enshrined in cultural contexts, such as morals and ethics, codified in legislative normative systems (Durkheim, 1893, *passim*). In this context, the purpose of this paper is to analyse the possible causes of violence in Europe considering current migratory phenomenon and other socioeconomic factors. In particular, the study here endeavours to analyse relationships between some types of crime, such as homicides, thefts, sexual violence, etc., and some demographic and economic variables. A statistical analysis tries to verify whether there are correlations between immigration, unemployment, crime and violent behaviour in Europe. The structure of this paper is as follows. Next section presents the theoretical framework. After that, the study shows materials and methods to analyse the relationships under study. In addition, a spatial analysis is performed to verify if the crime rate is higher or lower in the northern or southern Europe. Finally, this study discusses results and suggests some socioeconomic implications for policymakers to design policies that reduce violent behaviour in society.

2. Theoretical framework and working hypotheses

One of the scientific problems in criminology is socioeconomic factors that cause violent crime, aggression and violent behaviour in society (Coccia, 2017). As a matter of fact, crime can be due to manifold socioeconomic determinants, such as poverty (Lee, 2016), urban densities (Christens & Speer, 2005), psychosocial risk factors (Agnew, 1985), hot temperature as driver of aggression and violent behaviour (Allen, Anderson, & Bushman, 2018; Anderson, 1989), etc. In particular, Coccia (2017, p.190) argues that: “socioeconomic inequality is positively associated with violent crime. In particular, the findings ...seem in general to support the hypothesis that differences between countries in intentional homicides (per 100,000 people) can be explained by the level of income inequality alone, and not thermal climate as a second predictor or the interaction of income inequality and thermal climate. These results suggest that income inequality may overpower the role of hot weather and seasonal variation of temperature to explain the level of violent crime in human society”.

The immigration has received considerable attention in recent years since the public and the media tend to associate the phenomenon with many criminal activities within advanced societies, such as the North America and Europe. The vast literature shows different positions (Dai *et al.*, 2013). On the one hand, it is commonly accepted that immigrants may increase the crime rate, but on the other hand recent studies show that the opposite is true. In fact, immigrants may increase the crime rate because their entry into the non-specialized labor market lowers the conditions of the same market and thus contribute to reducing the possibilities of integration of native workers (Borjas *et al.*, 2010). On the other hand, recent studies by Hooze & De Vroome (2015), analysing Belgium, show that there is no correlation between the entry of immigrants into the labor market and an increase in perception linked to crime rate. It was also found that “by lowering the unskilled wage rate, immigration reduces the opportunity cost of investment in education and encourages more natives to upgrade their skills, which decreases the number of unskilled workers and hence has a positive effect on the crime rate” (Dai *et al.*, 2013, p.157). However, there are main considerations to be done within the same migration phenomenon. In Sweden, studies show that younger people are more likely to commit crimes than older ones and this does not necessarily occur among natives (Beckley, 2015). In the debate, therefore, sample segmentation and a

phenomenon wider contextualization may play an important role. Reid (2005, p.758) argues that: “Missing from the literature on immigration and crime is a consideration of how immigration affects rates of crime at the macro-level”. Since immigrants always fit into a pre-structured socioeconomic context, it is necessary to analyse the problem at macro level, rather than individual behaviour. Although the impact of crime by immigrants is often lower than the natives one, this is not a true image of their general impact on society. In fact, as Reid (2005) critically observes, their macroscopic influence is refracted both on the single episodes of crime and on the possibility that natives could deviate and commit crimes. This social issue can hardly be grasped by the analysis, namely the fact that a large immigrant population could flood the low-wage labor market forcing the native-born population out of the labor market and into a chronic unemployment, leading to criminal activities of displaced workers (Grogger, 1998).

Immigration and its impact on society is not just a European problem. Feldmeyer *et al.*, (2015, p.2) argue that:

“Drawing from the rich literatures on racial segregation and ethnic enclaves, a particularly salient issue is how the segregation of immigrants within communities (relative to the U.S. born) might affect violence rates. To date, research on immigration and crime has largely focused on how the size or growth of immigrant populations (e.g., percent foreign born) is associated with crime rates across communities but has given far less consideration to how immigrants are spatially-distributed within macro-level units”.

Most of the studies discussed just mentioned belong to the category of quantitative studies. However, there are studies in literature where the emphasis has been placed on qualitative issues, such as well-being and, more generally, on causes and effects of happiness about migration phenomenon, such as both the problem of migration by unhappy natives and the one of migrants' decision to settle in certain happier regions (Akay *et al.*, 2014). Akay *et al.* (2014, p.80) argue that in Germany: “as the number of immigrants increases in a region, natives might decide to move to a different one. If natives who are actually those who experience a decrease in their utility as a consequence of immigration, then the remaining sample of non-movers observed in the data will possess a relatively higher level of well-being”.

Conversely, other studies have investigated the reasons why crimes are not committed (DeCamp, 2015). The theory of social bonding by Hirschi (1969) states that: “there are four social factors that prevent delinquency: attachment, commitment, involvement, and belief” (DeCamp, 2015, p.45).

However, there are some theories that deviate from the dominant paradigm according to which crime is a form of cultural deviance and is necessarily related to immigration. Examples in this sense are provided by theories ascribable to what in literature is called *conflict paradigm*: crime is a normal function of certain groups (DeCamp, 2015). “Theories within this paradigm are often called *theories of critical criminology*. The groups in these theories, however, have neither the power to create laws protecting their preferred actions, nor the ability to remove laws barring such actions” (DeCamp, 2015, p.46, Italics added).

In general, the phenomenon under study here is a complex social issue because the effects of immigration and socioeconomic factors on crime are often not equal over time and space within and between societies. There are studies that deal with social issues of the impact of immigration on crime and political debate can use this problem during election, such as in Italy (Barone *et al.*, 2016). In fact, it was found that the election campaigns for the 2001 elections in Italy were the first to focus mainly on the social issue of immigration linked to that of national security (Barone *et al.*, 2016). It emerges clearly that the problem has to be also addressed from the point of sociological analyses.

Hence, considering the theoretical framework discussed above, it is possible to declare some working hypotheses as follows:

- *Working hypothesis 1 (WH1)* Immigration increases criminal activities between

countries

- *Working hypothesis 2 (WH2)* Criminal activities are higher in poor rather than rich countries.

The purpose of the study here is to see whether statistical evidence supports the hypotheses just mentioned.

3. Materials and methods

Sample

The sample of this study is based on following countries in Europe: Belgium, Bulgaria, Czech Republic, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Croatia, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, the Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden, United Kingdom, Iceland, Liechtenstein, Norway, Switzerland, Montenegro, Macedonia, Albania, Serbia, and Bosnia Herzegovina.

Measures

Crime is measured with the following variables for 2008-2013 period:

- *Homicide* is defined as an unlawful death purposefully inflicted on a person by another person, including serious assault leading to death and death as a result of a terrorist attack. Attempted homicide, manslaughter, death due to legal intervention, justifiable homicide in self-defense and death due to armed conflict are excluded. Intentional homicide is reported fairly consistently across jurisdictions within the EU, with definitions varying less between countries than for other types of crime (Eurostat, 2018).
- *Sexual violence* includes rape and other sexual assault. Rape is defined as sexual intercourse without valid consent and sexual assault refers to sexual violence not amounting to rape. Sexual assault includes an unwanted sexual act, an attempt to obtain a sexual act, or contact or communication with unwanted sexual attention not amounting to rape. It also includes sexual assault with or without physical contact, including drug-facilitated sexual assault; sexual assault committed against a marital partner against her/his will, sexual assault against a helpless person, unwanted groping or fondling, harassment and threats of a sexual nature (Eurostat, 2018).
- *Theft* is defined as depriving a person or organization of property without force with the intent to keep it. For the purpose of this article, theft excludes burglary, housebreaking, robbery and theft of a motor vehicle (Eurostat, 2018).
- *Assault* refers to physical attack against the body of another person resulting in serious bodily injury. It excludes indecent/sexual assault, threats and slapping/punching. Assault leading to death is also excluded (Eurostat, 2018).

Migration of population, as defined by Eurostat (2018), is measured here by following variables:

- *Crude rate of net migration plus adjustment* (2008-2013): The crude rate of net migration plus adjustment is defined as the ratio of net migration (including statistical adjustment) during the year to the average population in that year. The value is expressed per 1000 persons. The net migration plus adjustment is calculated as the difference between the total change and the natural change of the population (Eurostat, 2018).
- *First generation of immigrants (total 2014)*: immigrants are people arriving or returning from abroad to take up residence in a country for a certain period, having previously been resident elsewhere. Immigration is the number of immigrants for a given area during the year. First generation of immigrants is foreign born citizens or residents who have immigrated to a new country of residence (Eurostat, 2018).

Socio economic factors, as defined by Eurostat (2018), are measured as follows:

- *GDP per capita*: Gross Domestic Product, abbreviated as GDP, is a basic

measure of the overall size of a country's economy. As an aggregate measure of production, GDP is equal to the sum of the gross value added of all resident institutional units engaged in production, plus any taxes on products and minus any subsidies on products. Gross value added is the difference between output and intermediate consumption (Eurostat, 2018).

- *Unemployment*: An unemployed person is defined by Eurostat, according to the guidelines of the International Labour Organization, as: someone aged 15 to 74 (in Italy, Spain, the United Kingdom, Iceland, Norway: 16 to 74 years); without work during the reference week; available to start work within the next two weeks (or has already found a job to start within the next three months); actively having sought employment at some time during the last four weeks (Eurostat, 2018).

4. Data analysis and procedures

Data are from EUROSTAT for 2008 – 2013 period. The study design is based on descriptive statistics, correlation and regression analyses. Data have had a horizontal and vertical cleaning (removing some countries with missing values). The normal distribution of variables is checked with Kurtosis and Skewness coefficients. Skewed variables were ln-transformed before including in statistical analyses.

Preliminary analyses performed here are:

Descriptive statistics: Arithmetic mean (M), Standard Deviation (SD), Asymmetric Coefficient (AS) and Kurtosis (KS). Data are also analysed with a comparative study, using descriptive statistics (arithmetic mean and standard deviation), between the following groups of countries:

- M: Mediterranean Countries = Albania, Bosnia and Herzegovina, Croatia, Cyprus, Republic of Macedonia, Greece, Italy, Kosovo, Malta, Montenegro, Portugal, Serbia, Slovakia, Slovenia, Spain. *This set of countries tends to have average GDP per capita lower and unemployment rate higher than Central-Northern European Countries.*
- CN: Central-Northern European Countries = Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Latvia, Liechtenstein, Lithuania, Luxembourg, Netherlands, Norway, Poland, Romania, Sweden, Switzerland, UK. *This set of countries tends to have average GDP per capita higher and unemployment rate lower than Mediterranean Countries in Southern Europe.*

Main statistical analyses are:

Correlation analysis does not specify the direction of causality between variables X and Y , and provides a measure of the degree of association among observations x_i and y_i ($i=1, \dots, N$) with the Pearson's correlation coefficient, r (Wonnacott and Wonnacott, 1990). Variables under study in correlation analyses here are indicated in the section "Measures". This analysis is also performed dividing the countries in High and Low GDP per capita, according to countries have a GDP per capita higher or lower the arithmetic mean of the sample under study. Finally, a partial correlation is performance between some variables, controlling GDP per capita.

Regression analysis estimates the relationships among variables. In general, regression analysis focuses on the relationship between a dependent variable and one or more explanatory variables (called predictors). The specification of liner models of simple regression analysis applied here is given by:

$$Y_t = \lambda_0 + \lambda_1 x_t + u_t \quad t=\text{time} \quad (1)$$

where:

Y_t = Intentional Homicide per 100,000 inhabitants, 2008-2013 period

x_t = Unemployment rates (%), 2008-2013 period

u_t = Error term

$$Z_t = \alpha_0 + \alpha_1 w_t + \varepsilon_t \quad t=time \quad (2)$$

where:

Z_t = Sexual Assault, 2008-2013 period

w_t = Crude rate of net migration plus adjustment (2008-2013)

ε_t = Error term

Remark: Skewed variables were ln-transformed before including in statistical analyses in order to analyse normal distributions. Goodness of fit is measured with the coefficient of determination R^2 . Analysis of Variance (ANOVA) is also performed to calculate the F -test and check the overall significance of models under study (Wonnacott & Wonnacott, 1990). These models are estimated with the Ordinary Least Squares (OLS) method. Next section presents the results of statistical analyses. Statistical analyses here are performed with Statistics Software SPSS®21.0

5. Results

The variable Homicide and Theft show a low variance within sample under study (Mhomicide= 1.77; SD= 1.37; Mtheft = 1421.79; SD= 1275.13, respectively), whereas, assault shows high variability within sample (Massault= 225.88; SD= 386.08; cf., Table 1). High variability is also present for data of sexual violence, rape and sexual assault.

Table 1. Descriptive statistics

	Homicide 2008-2013	Assault 2008-2013	Sexual Violence 2008-2013	Rape 2008-2013	Sexual Assault 2008-2013	Theft 2008-2013
V	38	38	33	37	34	38
M V	0	0	5	1	4	0
AM	1.77	225.88	39.90	10.41	28.73	1421.79
SD	1.37	386.08	53.48	15.69	38.62	1275.13
AS	2.08	3.48	2.73	3.17	2.46	1.69
ASE	0.38	0.38	0.41	0.39	0.40	0.38
KS	4.45	14.93	8.49	10.80	6.72	3.53
KSE	0.75	0.75	0.80	0.76	0.79	0.75

Note: V= Valid cases; M V= Missing Values; AM= Arithmetic Mean; SD= Standard Deviation; AS= Asymmetry; ASE= Asymmetry Standard Error; KS= Kurtosis; KSE= Kurtosis Standard Error.

Table 2. Descriptive statistics between Mediterranean countries and Central-Northern European countries

		Homicide	Assault	Sex Violence	Rape	Sex Assault	Theft	GDP PC	Crude rate of net migration	Unemployment rate	1st gen of immigrants	
M	N	Valid	15	15	12	14	13	15	11	15	10	9
		Missing	0	0	3	1	2	0	4	0	5	6
		Mean	1.68	68.94	11.72	2.36	9.15	671.15	14095.45	1.07	13.79	1291.02
		Std. Dev.	0.94	75.21	7.31	1.11	6.13	614.28	7720.60	4.00	7.56	2042.59
CN	N	Valid	23	23	21	23	21	23	22	23	22	18
		Missing	0	0	2	0	2	0	1	0	1	5
		Mean	1.83	328.24	56.00	15.31	40.85	1911.34	27701.14	1.58	7.93	1513.71
		Std. Dev.	1.61	468.34	61.63	18.32	45.11	1363.72	18064.67	6.16	3.00	2530.99

Note: 1st gen of immigrants = First generation of immigrants (total 2014). Countries: M: Mediterranean Countries = Albania, Bosnia and Herzegovina, Croatia, Cyprus, Republic of Macedonia, Greece, Italy, Kosovo, Malta, Montenegro, Portugal, Serbia, Slovakia, Slovenia, Spain. CN: Central-Northern European Countries = Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Latvia, Liechtenstein, Lithuania, Luxembourg, Netherlands, Norway, Poland, Romania, Sweden, Switzerland, UK

Table 2 shows that homicides, assault, sexual violence, rape, sexual assault, theft, GDP per capita, crude rate of net migration, and first generation of

immigrants are higher in Central-Northern European countries than Mediterranean countries.

Table 3. Correlation

		Homicide	Assault	Sexual Violence	Rape	Sexual Assault	Theft	Unemployment	Crude rate of net migration
Homicide	r	1.00							
	Sign.								
	N								
Assault	r	-0.13	1.00						
	Sign.	0.48							
	N	32							
Sexual Violence	r	-0.19	.63**	1.00					
	Sign.	0.34	0.001						
	N	28	28						
Rape	r	-0.01	.52**	.82**	1.00				
	Sign.	0.95	0.001	0.001					
	N	31	31	28					
Sexual Assault	r	-0.25	.59**	.98**	.71**	1.00			
	Sign.	0.19	0.001	0.001	0.001				
	N	29	29	28	28				
Theft	r	-0.09	.54**	.65**	.65**	.61**	1.00		
	Sign.	0.64	0.001	0.001	0.001	0.001			
	N	32	32	28	31	29			
Unemployment	r	.45*	-0.19	-.46*	-.47**	-.43*	-.49**	1.00	
	Sign.	0.01	0.32	0.01	0.001	0.02	0.001		
	N	31	31	27	30	28	31		
Crude rate of net migration	r	-.49**	0.32	.41*	0.30	0.37	0.20	-.59**	1.00
	Sign.	0.001	0.08	0.03	0.10	0.05	0.27	0.001	
	N	32	32	28	31	29	32	31	

Note: * Correlation is significant at the 0.05 level (2-tailed); ** Correlation is significant at the 0.01 level (2-tailed).

Table 3 shows that intentional homicide has a high positive association with unemployment between EU countries ($r = 0.45$, p -value < 0.01), whereas there is a negative association between Crude rate of net migration and intentional homicide ($r = -0.49$, p -value < 0.001).

Table 4. Partial Correlation, controlling Gross Domestic Product (GDP) per capita

Control variable:		Homicide	Assault	Sexual Violence	Rape	Sexual Assault	Theft	Unemployment
GDP PC	r	1.00						
	Sign.							
	df							
Assault	r	.09	1.00					
	Sign.	.66						
	df	24						
Sexual Violence	r	.25	.39	1.00				
	Sign.	.20	.04					
	df	24	24					
Rape	r	.48	.36	.80	1.00			
	Sign.	.01	.06	.00				
	df	24	24	24				
Sexual Assault	r	.10	.35	.95	.59	1.00		
	Sign.	.59	.07	.00	.00			
	df	24	24	24	24			
Theft	r	.24	.37	.56	.44	.55	1.00	
	Sign.	.22	.06	.00	.02	.00		
	df	24	24	24	24	24		
Unemployment	r	.29	.10	-.23	-.21	-.17	-.30	1.00
	Sign.	.13	.60	.25	.28	.39	.13	
	df	24	24	24	24	24	24	

Note: r = Pearson's correlation; Sign = Significance; df = degree of freedom; GDP PC = Gross Domestic Product per Capita.

Table 5. Bivariate correlation with logarithmic values

		LN Homicide	LN Assault	LN Sex Violence	LN Rape	LN Sex Assault	LN Theft	LN Unempl oyment	LN 1stgenim mtot
LN Homicide	r	1							
	Sig.								
	N								
LN Assault	r	-.128	1						
	Sig.	.484							
	N	32							
LN Sex Violence	r	-.188	.631**	1					
	Sig.	.337	.001						
	N	28	28						
LN Rape	r	-.011	.520**	.825**	1				
	Sig.	.952	.003	.001					
	N	31	31	28					
LN Sex Assault	r	-.250	.596**	.980**	.710**	1			
	Sig.	.191	.001	.001	.001				
	N	29	29	28	28				
LN Theft	r	-.087	.542**	.659**	.657**	.616**	1		
	Sig.	.636	.001	.001	.001	.001			
	N	32	32	28	31	29			
LN Unemployment	r	.452*	-.185	-.468*	-.477**	-.432*	-.499**	1	
	Sig.	.011	.318	.014	.008	.022	.004		
	N	31	31	27	30	28	31		
LN 1stgen immmtot2014	r	-.348	.516**	.702**	.538**	.660**	.466*	-.100	1
	Sig.	.075	.006	.001	.005	.001	.014	.620	
	N	27	27	24	26	25	27	27	

Note: *. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed). LN1stgenimmmtot2014 = LN First generation of immigrants (total 2014).

Table 5 shows that the variable first generation of immigrants (total 2014) has a high positive association with assault ($r = 0.516$, p -value < 0.006), sex violence ($r = 0.702$, p -value < 0.001), rape ($r = 0.538$, p -value < 0.005), sex assault ($r = 0.66$, p -value < 0.001), theft ($r = 0.466$, p -value < 0.014), whereas unemployment has a positive association with intentional homicide ($r = 0.452$, p -value < 0.011).

Tables 6 and 7 show correlation considering countries with GDP per capita higher or lower than arithmetic mean of the sample under study.

Table 6. Correlations in countries with GDP per capita lower than arithmetic mean

		LN Unemployment	Crude rate of net migration
LN Homicide	r	0.22	-.691**
	Sign.	0.41	0.001
	N	16	17
LN Assault	r	-0.03	0.22
	Sign.	0.90	0.40
	N	16	17
LN Sex Violence	r	0.07	0.13
	Sign.	0.80	0.62
	N	15	16
LN Rape	r	-0.25	-0.10
	Sign.	0.34	0.69
	N	16	17
LN Sex Assault	r	0.17	0.16
	Sign.	0.55	0.55
	N	15	16
LN Theft	r	-0.15	-0.24
	Sign.	0.58	0.36
	N	16	17

Note: *. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed).

Table 6 shows that intentional homicide has a high negative association with crude rate of net immigration between EU countries with a low GDP PC ($r = -0.69$, p -value < 0.001).

Table 7. Correlations in countries with GDP per capita higher than arithmetic mean

		LN Unemployment	Crude rate of net migration
LN Homicide	r	0.47	-0.05
	Sign.	0.08	0.85
	N	15	15
LN Assault	r	0.49	0.03
	Sign.	0.06	0.91
	N	15	15
LN Sex Violence	r	-0.04	0.39
	Sign.	0.91	0.21
	N	12	12
LN Rape	r	0.20	0.04
	Sign.	0.48	0.90
	N	14	14
LN Sex Assault	r	-0.22	0.16
	Sign.	0.46	0.60
	N	13	13
LN Theft	r	-0.14	0.06
	Sign.	0.62	0.84
	N	15	15

Note: *. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed).

Table 7 does not show any association of variables under study between EU countries with a high GDP per capita.

Table 8. Estimated relationship of homicide on unemployment

	Non-standard Coefficients		Standard Coefficients	t	Sign.
	B	Standard Error	Beta		
LN Unemployment	.67	.247	.452	2.72	.011
Constant	-1.13	.532		-2.13	.041

Note: Dependent variable is LN Homicide (2008-2013); Explanatory variable is LN Unemployment rate (2008-2013).

The coefficient of regression of model in table 8 indicates that a 1% higher level of unemployment seems to increase the expected intentional homicides by 0.67 % ($p\text{-value} < .011$). R^2 of model in table 8 indicates that about 18% of the variation in violent crimes (intentional homicides) can be attributed (linearly) to unemployment.

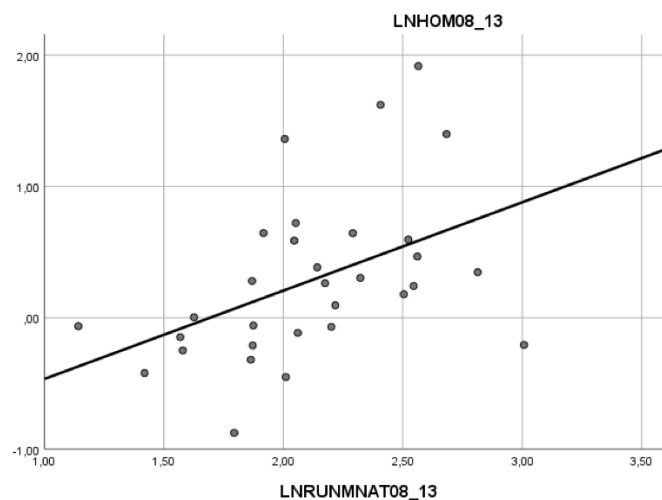


Figure 1. Estimated relationship of homicide (LNHOM08_13) on unemployment rate (2008-2013), (logarithmic scale)

Table 9. *Estimated relationship of crude rate of net migration on sexual assault*

	Non-standard Coefficients		Standard Coefficients	t	Sign
	B	Standard Error	Beta		
Crude rate of net migration	.08	.04	.37	2.04	.05
Constant	2.81	.20		14.27	.001

Note: Dependent variable is LN Sexual Assault (2008-2013); Explanatory variable is crude rate of net migration (2008-2013).

R² of model 2 indicates that about 10% of the variation in sexual assaults can be attributed (linearly) to rate of net migration. It seems that an increase of crude rate of net migration might slightly increase sexual assault (Table 9). However, the model is weak.

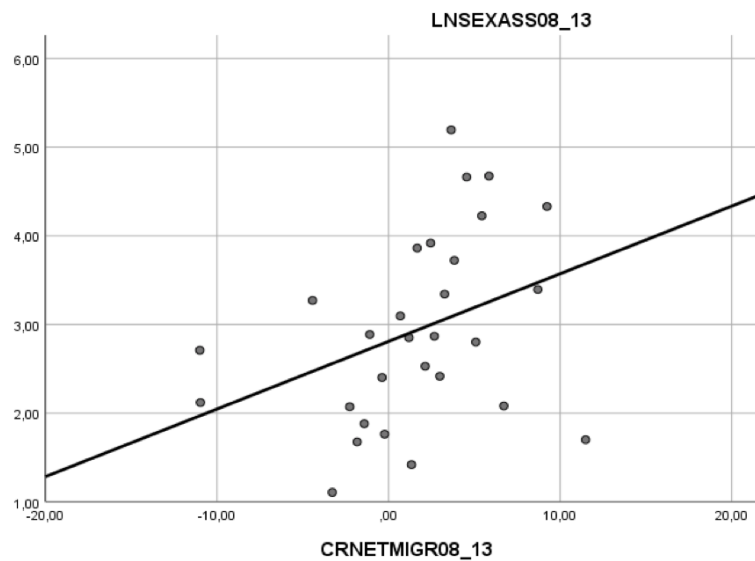


Figure 2.

Estimated relationship of sexual assault on crude rate of net migration (logarithmic scale), 2008-2013 period.

6. Discussion and concluding remarks

This study shows possible relationships between crime, immigration, and unemployment. Results seem to show that immigration and unemployment might increase specific typologies of crime in Europe. In particular, results suggest an association between specific crimes -such as theft, assaults and sexual violence- and immigration *but not* between intentional homicides and immigration (*Working hypothesis 1*). The study also shows that intentional homicides are associated with high rates of unemployment, linking this violent crime to socioeconomic and situational factors within countries (cf., [Benati & Coccia, 2017, 2018](#)).

Moreover, the statistical analysis does not support (i.e., falsify *sensu* Popper) *Working hypothesis 2*: criminal activities are higher in rich rather than poor countries. In fact, statistical evidence reveals higher intensity of the typologies of crime in central-northern Europe (richer regions, with higher GDP per capita) than Mediterranean countries with lower GDP per capita.

These findings can be explained as follows: richness of countries attracts immigration and this might generate social repercussions that foment crime both at a micro and macro level. In general, immigrants tend to enter in European non-specialized labor market that is congested and this reduces their possibilities for inclusion and possibly this is a precipitating factor of crime. Moreover, poor migrant people induce higher income inequality in richer countries and this socioeconomic issue generates “relative deprivation”: inequality breeds social tensions and the less well-off individuals feel dispossessed when compared with

wealthier people (Stack, 1984; Coccia, 2017). As a matter of fact, in richer societies poor migrant people can be frustrated by their failure to attain the material attributes of success (this failure is more galling when they are confronted by the success of those around them) might become violent in a place where economic inequality is high (Fajnzylber *et al.*, 2002). In particular, the relative deprivation “reduces one's ability to compete for scarce jobs by imposing standards of competition that those individuals cannot realistically be expected to meet, and, therefore, it is directly related to involvement in crime and violence as those individuals adapt to that reality in any way they can” (Kovandzic *et al.*, 1998, p. 590). In addition, high levels of income inequality induce feeling of disadvantage and unfairness that leads poor people, such as migrants, to seek compensation and satisfaction by all means, including committing crimes against poor and rich individuals (Fajnzylber *et al.*, 2002). In short, immigration, combined with high income inequality, can generate negative social interactions, resource deprivation and low sense of control over one's life (Elgar & Aitken, 2011, Coccia, 2017).

This study also shows that it is not simple to discover the comprehensive effects of immigration on crime because the relation is affected by manifold factors. Overall, then, we stress that the results of this study are preliminary. Even though we could not face a comprehensive analysis of these social issues for their complexity, in the presence of a continuous social change in Europe, we believe that psychosocial risk factors and income inequality have their vital weight in the debate on the relationship between crime, immigration, and other socioeconomic indicators (cf. also, Coccia, 2017). The preliminary results here can also support fruitful insights for a policy of conflict resolution that ameliorates socioeconomic conditions of population, and indirectly reduces violence and other crimes, such as programs of economic aid directed to eliminate income inequality and improve the standard of living and work opportunities of young people in society (cf., Ackoff & Rovin, 2003; Ehrlich, 1968). The aim is to provide education and socioeconomic opportunity for young population and migrants to support wellbeing and reduce *situational factors* of aggression and violent behaviour (cf., Agnew, 1985). In fact, Krieger & Meierrieks (2010, p.902) confirm that social policies ameliorate short-run and long-run socioeconomic conditions of population (e.g., reduction of unemployment, poverty, inequality, and social dissatisfaction), and indirectly reduce relative deprivation of people and violence as a result. As a matter of fact, developmental programs can help to raise socioeconomic progress and wellbeing directed to lower income inequality, poverty and relative deprivation of poor people, such as migrants, that are factors underlying violence in society. Fajnzylber *et al.* (2002) also claim that economic growth and equal distribution of income reduce poverty, and the rate of poverty alleviation has a crime-reducing effect.

To conclude, statistical evidence here seems to show that immigration and unemployment might increase specific typologies of crime in Europe. However, we reiterate that results here are, of course, tentative. Variables taken into consideration here provide a partial framework for a comprehensive analysis of these social issues in Europe because, in general, many factors between countries are often not equal over time and space. There is need for much more detailed research into the relations between unemployment, immigration, and crime. Hence, further empirical studies will be needed in future to explore this *terra incognita* and verify, with more data between countries, the reliability of results discussed here.

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Notes

¹ Cf. also Calabrese et al., 2005; Calcatelli et al., 2003; Cavallo et al., 2014, 2015; Chagpar and Coccia M. 2012; Coccia and Rolfo, 2010, 2013; Coccia, 2001, 2002, 2003, 2004, 2005, 2005a, 2005b, 2005c, 2005d, 2005e, 2006, 2006a, 2007, 2008, 2009, 2009a, 2010, 2010a, 2010b, 2010c, 2010d, 2012, 2012a, 2012b, 2012c, 2012d, 2013, 2013a, 2014, 2014a, 2014b, 2014c, 2014d, 2014e, 2014f, 2015, 2015a, 2015b, 2016, 2016a, 2017, 2017a, 2017b, 2017c, 2017d, 2017e, 2017f, 2017g, 2017h, 2017i, 2017l, 2017m, 2018, 2018a, 2018b, Coccia and Cadario, 2014; Coccia et al., 2010, 2015; Coccia and Finardi, 2012.

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