The relationship between crime, immigration and socioeconomic factors

La relazione tra criminalità, immigrazione e fattori socioeconomici

Ellen G. Cohn, Mario Coccia, Suman Kakar

Abstract

This macro-level study endeavours to analyse possible relationships between various types of crime and socioeconomic factors in 39 European countries using data from EUROSTAT. Results suggest that crime seems to be higher in rich rather than poor countries. In addition, crime seems to be associated with socioeconomic rather than demographic factors. Moreover, statistical analyses also suggest that immigration (as measured by International migrant stock as % of population) is positively associated with, sexual violence and theft across European countries. The findings of this paper can provide a preliminary analysis and encourage the development of more in-depth studies to better understand the general dynamics of crime in Europe and their possible interrelationships with situational factors in order to support relevant policy implications in society.

Keywords: Homicide, Sexual Violence, Theft, Poverty, Immigration, Europe.

Riassunto

L'obiettivo di questo studio è di investigare la relazione tra alcune tipologie di crimine e fattori socioeconomici e demografici in Europa. I risultati rivelano che i paesi ricchi, misurati con un elevato PIL pro-capite, hanno una maggiore incidenza di criminalità rispetto ai paesi con un più basso livello di PIL pro-capite. I risultati sembrano anche suggerire che alcune variabili di immigrazione sono associate ad alcune tipologie di crimine, come violenza sessuale e furti. Questi risultati preliminari sono importanti per stimolare ulteriori ricerche dirette a spiegare queste relazioni in società dinamiche.

Parole chiave: Omicidio, Violenza Sessuale, Furti, Povertà, Immigrazione, Europa.

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Introduction

The nexus between crime, immigration and socioeconomic factors is not a new phenomenon. In fact, this issue has been a part of the American academic and criminal justice landscape since 1900s with the development of criminological theories, such as the Chicago School and the like based entirely on understanding crime in the context of immigration and immigrants. Additionally, the idea that immigration increases crime rates has been central to public and political discourses and debates on immigration policy in the United States since late 1800s (Wadsworth, 2010). However, it was not considered to be a significant problem in Europe until the 1960s, due to the increased movement of people from Southern Europe and the Mediterranean area towards Central and Northern Europe (Melossi, 2003). More recently, internal wars have increasingly led African and Middle Eastern populations to migrate to other countries (Hugo, 2005). The most recent Eurobarometer survey found more respondents identified immigration as one of the most important social issues facing the European Union (EU) than any other concern (King and Lulle, 2016).

Concerns over the impact of immigration on host countries have primarily emphasized economic issues (see e.g., Barone, D'Ignazio, De Blasio, & Naticchioni, 2016; Dai, Liu, & Xie, 2013; Feldmeyer, Harris, & Scroggins, 2015), but current debate has also addressed the effect of migration flows on the security and well-being of host societies, and the relationship between immigration and crime has resurfaced as a key topic of concern. However, inconsistencies in the literature suggest the need for additional research. The goal of this investigation is to analyse possible causes of violence in Europe, considering migratory phenomena and other socioeconomic factors. In particular, this study analyses relationships between socioeconomic and demographic variables and various types of crime, including homicide, sexual violence, and theft, to identify possible relationships between immigration, socioeconomic status, and crime in Europe. In addition the results are reviewed and socioeconomic implications for policymakers are provided.

Literature review

The impact of immigration on crime rate within globalized societies has been debated for decades, although much of the recent research has focused on the United States. The literature can be contradictory and inconsistent (see e.g., Feldmeyer et al., 2015; Hagan, Levi, & Dinovitzer, 2008; Ousey & Kubrin, 2018). While many researchers argue that immigration contributes to an increase in crime, more recent research suggests that this may not be the case. Parkin (2013, p.17) reviewed research on the criminalisation of migration in Europe and stated, "there is little evidence that immigrants, regular or irregular, are responsible for a disproportionate share of crime". Fasani, Mastrobuoni, Owens, & Pinotti (2019, p.2) have pointed out that, "the propensity to engage in crime may vary strongly with social context and the composition of the immigrant population".

There is a considerable amount of research in Europe which suggests a positive correlation between immigration and crime. Solivetti (2018) examined cross-sectional time-series data of crime in Italy and found a direct association between immigration and both violent and property crime. Fasani et al. (2019), also studying crime in Italy, found that immigrants are significantly overrepresented among those charged with, convicted of, and incarcerated for criminal offenses.

Kuhne (2002) reported that while first generation immigrants in Germany are less likely to commit crimes, their children tend to engage in more crime than native German juveniles. Piopiunik & Ruhose (2017) reported that immigration of ethnic Germans significantly increased all crime types except burglary. The researchers suggested that this result may in part be related to the fact that these immigrants were granted citizenship upon arrival in the country; this access to legal status protects them from the possibility of deportation associated with criminal activity, a risk that may act as a deterrent to asylum seekers from other countries (this argument is also supported by Mastrobuoni & Pinotti, 2015).

Leerkes, Engbersen, and van der Leun (2012) found a significant increase in the percentage of criminal suspects apprehended by police in the Netherlands who were undocumented or "irregular" immigrants between 1997 and 2003; they suggest that factors such as social marginalization contributed to this increase. Bovenkerk and Fokkema (2016) reported that while crime rates among the first generation of Moroccan immigrants to the Netherlands was below average, over half of the second generation of young Moroccan men have been charged with at least one criminal offense by age 23. Researchers in France found that unemployed immigrants are more likely to commit crimes than unemployed citizens. They suggest that this may be due at least in part to the more adverse economic circumstances experienced by immigrants compared to nonimmigrants (Aoki and Todo, 2009).

Multiple research studies conducted in Sweden since the 1970s have found that immigrants are overrepresented

in criminal involvement, as are Swedish-born children of immigrants. However, there has been little research into possible causes, although it may be due at least in part to discriminatory practices by the criminal justice system and to differences in immigrant vs. native living conditions (see Beckley, Kardell, & Sarnecki, 2014).

Finally, Lynch and Simon's (2002) examination of immigrant involvement in crime in seven countries reported that countries with more restrictive immigrant policies had significantly higher ratios of immigrant to non-immigrant crime. They argued that this may be related to increased difficulties faced by immigrants in these countries when attempting to integrate into mainstream society. This result is supported by Angeloni & Spano (2018), who also emphasize the difficulties immigrants have in integrating into a host community that lacks positive attitudes towards immigrants.

Conversely, there is also research in Western Europe that supports a negative or nonsignificant relationship between immigration and crime. Bianchi, Buonanno, and Pinotti (2012) found no effect of immigration on various types of crime in Italy, other than robberies, or on the overall crime rate. Fasani et al. (2019) report a clear over-representation of immigrants in prisons in Italy and they also point out that while immigration has increased significantly in Italy since the early 1990s, crime rates have either remained constant or declined. They particularly point out the clear decrease in the incidence of certain serious crimes (homicide, theft, and bank robbery).

Bell, Fasani, & Machin, (2013) compared immigration to the United Kingdom (UK) of asylum seekers in the late 1990s and early 2000s to the more recent flow of migrant workers that began in 2004 as a result of the opening of the United Kingdom labour market to citizens of the European Union (EU) and found that while the earlier immigration of asylum seekers was associated with an increase in property crime, the more recent wave of immigrants from EU accession countries were associated with a reduction in property crime; violent crime showed no effect from either wave. Similarly, neither Jaitman & Machin (2013) nor Fasini et al (2019) found any significant impact of immigration on criminal activity in the UK and Papadopoulos (2010) found no significant relationship between immigration status and self-reported involvement in crime.

However, much of the research examining immigration and crime is not only contradictory and ambiguous but also incomplete, particularly when socioeconomic factors are also incorporated. Reid, Weiss, Adelman, & Jaret (2005, p. 758) point out that the literature lacks macro-level research. They stress that because immigrants must fit into the pre-existing socioeconomic context of the host country, individual-level research is not sufficient, and the problem should also be analysed at a macro-level. While the impact of crime committed by immigrants may be lower than the effect of crime committed by natives of the host country, this does not provide a full picture of the general impact of immigrants on crime in society. As Reid et al. (2005) observes, it is not only that immigrants may

engage in criminal activity but also that their presence may influence natives to commit crimes as well. A large influx of immigrants could flood the low-wage labour market, forcing native workers into chronic unemployment and resulting in their involvement in criminal offending (Grogger, 1998). For example, Borjas (2003) and Borjas, Grogger, & Hanson (2010) found that an increase in immigration was linked to a decrease in wages for host-country workers. The research of Bell et al. (2013) in the United Kingdom also shows that immigrant access to labour market opportunities may affect the impact of immigrants on crime. Aoki and Todo (2009) found that unemployed immigrants in France are more likely than unemployed citizens to commit crimes; they suggest this is due to the more adverse economic circumstances experienced by immigrants compared to nonimmigrants. Ousey and Kubrin (2009, p. 68) argued that economically disadvantaged immigrants are more likely to be "pushed into illegal market opportunities, such as the drug trade, for economic reasons". Buonanno (2006) found a relationship between immigration and property crime in Italy, when controlling for income and unemployment rates. Entorf & Spengler (2000) found similar results in Germany.

Conversely, while Card (2001, 2005; see also Butcher & Card 1991) stated that the effect of labour market competition from immigrants has the greatest impact on the least well-educated native workers, his research has showed a surprisingly weak relationship between immigration and labour market opportunities and wages for low-skilled native workers. A study by Brå (2005) reported that while the proportion of immigrants in Sweden identified as "poor" (earning less than half the median income) has increased, the risk of involvement in crime among immigrants has remained relatively unchanged. Similarly, neither Dustman, Fabbri, and Preston (2005) or Manacorda, Manning, and Wadsworth (2012) found any significant overall effect of immigration on the wages or employment opportunities of native workers in the United Kingdom.

Methodology

Sample and source of data
This study analyses 38 European countries in 2014, 2016 and 2017. Data were obtained from the Eurostat (2020a, 2020b, 2020c, 2020d) and World Bank (2020a, 2020b, 2020c) databases, which provide statistical information about the countries of the EU and include information on crime, types of migration, migration flows, and socioeconomic indicators.

Variables and measures of crime
Eurostat obtains data on crime from national authorities who collect information from multiple sources, including police and other law enforcement agencies, courts and prosecutors, correctional agencies, statistical offices, and relevant ministries (Eurostat, 2018). Crimes examined in

this study include homicide, sexual violence, and theft, using rates per 100,000 inhabitants in 2017.

Data on socioeconomic indicators were obtained from the World Bank, including the Gross Domestic Product per capita (GDPPC) based on purchasing power parity as well as income inequality, which is measured using the Gini coefficient. For both factors, data were obtained for 2016-2017 (World Bank 2020a, 2020b). Employment rates for ages 25 to 74 in 2016-2017 were obtained from Eurostat (2020b). Although 2017 crime rates were used in this study, socioeconomic data were also obtained for the immediately preceding year (2016), to allow for the possibility of a lag effect. Additionally, where there were missing values in 2017 (e.g., for income inequality), 2016 data values were used instead. This research strategy avoids misleading results and provides more robust findings.

Immigration data were obtained from both Eurostat and the World Bank. From Eurostat, data on the employment rate of first generation of immigrants was obtained for 2014, the latest year available (Eurostat, 2020c). From the World Bank, information on international migrant stock, which refers to the number of people born in a country other than the one in which they live, was obtained for 2015 (World Bank, 2020c).

Information on these variables, including abbreviations and detailed definitions of each, is provided in Table 1.

Variable	Variable Description
Hom	Intentional homicide per 100,000 inhabitants in 2017. Involves the willful and illegal killing of a human being. The crime does not have to be planned in advance but must involve the intent to cause death or serious injury. *Source*: Eurostat, 2020a
SexV	Sexual violence per 100,000 inhabitants in 2017. A combined measure including rape and sexual assault. Rape involves unwanted sexual penetration through the use of force, threat, coercion, intimidation, deception, drugs or alcohol, or the abuse of vulnerability. Sexual assault involves unwanted sexual acts other than rape through the use of force, threat, coercion, intimidation, deception, drugs or alcohol, or the abuse of vulnerability. *Source*: Eurostat, 2020a
Theft	Theft per 100,000 inhabitants in 2017. Involves unlawfully taking property with the intent to keep it permanently without consent and without violence, force, threat, coercion, or deception. *Source*: Eurostat, 2020a
GDPPC	Gross Domestic Product (GDP) per capita based on purchasing power parity (PPP)-constant 2011 international $- in 2016-2017. PPP GDP is gross domestic product converted to international dollars using purchasing power parity rates. An international dollar has the same purchasing power over GDP as the U.S. dollar has in the United States. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant 2011 international dollars. *Source*: The World Bank, 2020a
Inequal	Income inequality is measured with Gini coefficient in 2016-2017. Gini index measures the extent to which the distribution of income (or, in some cases, consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution. A Lorenz curve plots the cumulative percentages of total income received against the cumulative number of recipients, starting with the poorest individual or household. The Gini index measures the area between the Lorenz curve and a hypothetical line of absolute equality, expressed as a percentage of the maximum area under the line. Thus, a Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality. *Source*: The World Bank, 2020b
Unempl	Unemployment rates (%) by age 25-74 years in 2008-2009, and in 2016-2017. It indicates the number of people unemployed as a percentage of the labor force. *Source*: Eurostat, 2020b
1Gen_Employ	Employment rate of first generation of immigrant by age 15-64 years in 2014. *Source*: Eurostat, 2020c
Migr_Stock	International migrant stock (% of population) in 2015. International migrant stock is the number of people born in a country other than that in which they live. It also includes refugees. The data used to estimate the international migrant stock at a particular time are obtained mainly from population censuses. The estimates are derived from the data on foreign-born population—people who have residence in one country but were born in another country. When data on the foreign-born population are not available, data on foreign population—that is, people who are citizens of a country other than the country in which they reside—are used as estimates. After the breakup of the Soviet Union in 1991 people living in one of the newly independent countries who were born in another were classified as international migrants. Estimates of migrant stock in the newly independent states from 1990 on are based on the 1989 census of the Soviet Union. For countries with information on the international migrant stock for at least two points in time, interpolation or extrapolation was used to estimate the international migrant stock on July 1 of the reference years. For countries with only one observation, estimates for the reference years were derived using rates of change in the migrant stock in the years preceding or following the single observation available. A model was used to estimate migrants for countries that had no data. *Source*: The World Bank, 2020c

Table 1: Variables from Eurostat and The World Bank database

Methods

The relation between immigration, unemployment and other socioeconomic conditions, and crime was examined using a country-level analysis based on *N*=38 European countries. Skewed variables were *log*-transformed prior to being included in the statistical analyses. The countries under study were divided in two groups, based on their values above and below the arithmetic mean on the level of international migrant stock (% of population) in 2015. The list of countries in each group is shown in Table 2.

Level of International Migrant Stock	Countries
Low International Migrant stock	Albania, Bosnia and Herzegovina, Bulgaria, Czech, republic, Denmark, Finland, Hungary, Italy, Kosovo, Lithuania, Malta, Macedonia, Poland, Portugal, Romania, Serbia, Slovakia, Turkey
High International Migrant stock	Austria, Belgium, Croatia, Cyprus, UK, Estonia, France, Germany, Greece, Iceland, Ireland, Latvia, Luxembourg, Montenegro, Netherlands, Norway, Slovenia, Spain, Sweden, Switzerland

International Migrant stock *(arithmetic mean of sample N=38 is 11.01 in 2015)*
Table 2: Country groupings

Descriptive statistics (arithmetic mean, M and standard deviation, SD) were calculated for each country grouping, in order to detect differences in crime and other socioeconomic indicators within and between countries.

In addition, the independent samples *t*-test, which compares the means of two independent groups to determine whether the associated population means are significantly different, was used to test the following hypotheses:

- H_0: $\mu_1 = \mu_2$, the two population means in countries with high and low international migrant stock are equal.
- H_1: $\mu_1 \neq \mu_2$, the two population means in countries with with high and low international migrant stock are not equal.

Descriptive statistics associated with bivariate Pearson correlations were used to verify relationships between variables, with the degree of association determined by the coefficient of correlation. One-tailed tests of significance for correlation were computed to consider the associations between variables in the last year available in the databases. Partial correlations were also performed, controlling for level of income inequality and unemployment.

Linear functions of the dependent variables (the three crime measures) on the explanatory variables of immigration indicator were analyzed with following *log-log* model of simple regression:

$$log\ y_t = \alpha + \beta_1\ log\ x_{1,\ t-2} + u \qquad [1]$$

where

y = a dependent variable (homicide, sexual violence, or theft)
x_1 = an immigration-related explanatory variable (international migrant stock)
α is a constant; β= coefficient of regression; *u* = error termMultiple regression analysis were also performed, considering the following model:

$$log\ y_t = \alpha + \beta_1\ log\ x_{1,\ t-2} + \beta_2\ log\ x_{2,\ t-2} + u \qquad [2]$$

where

y = a dependent variable is sexual violence
x_1 = international migrant stock
x_2 = a socioeconomic explanatory variable given by income inequality
α is a constant; β= coefficient of regression; *u* = error term

Linear relationships between variables were analyzed based on the last year available in the database to provide the most updated information regarding current dynamics of the socioeconomic phenomena under study. Moreover, models [1] and [2] have a time lag delay of two years between explanatory (t-2) and dependent (t) variables. Because immigration and socioeconomic factors in previous years may affect crime in subsequent years, this better supports a logical relation between variables under study. In this way, estimated relationships can provide consistent and robust results regarding the phenomena being examined.

Ordinary least squares was used to estimate the unknown parameters of relations in the regression models described above [1-2]. In addition, R^2 and standard error

of the estimate were utilized to assess goodness of fit and results between models. *F*-tests were used to evaluate how reliably the independent variables used in each model predict the dependent variable.

This analysis provides a good approximation of the social dynamics of crime linked to immigration in countries that have a good or a problematic socioeconomic context. Statistical analyses were performed with SPSS® version 24. Overall, the purpose of these statistical analyses was to clarify and generalize, as far as possible, the main relations between crime and immigration, considering indicators of the socioeconomic context of European countries under study.

Results

Descriptive statistics

Descriptive statistics are shown in Table 3. In general, countries with high international migrant stock have higher mean levels of crime than countries with low international migrant stock, although in some cases, the standard deviation of variables is high because of differences between countries within each group. In addition, countries with high international migrant stock show a higher GDPPC, lower income inequality, and lower levels of unemployment. Additionally, the mean employment rate of first generation of immigrant is lower in countries with high international migrant stock. Moreover, independent samples T-test shows that SexV, GDPPC and 1Gen_Employ have a significant difference of means between groups under study.

	Low International Migrant stock		High International Migrant Stock			
	Mean	Std. Deviation	Mean	Std. Deviation	Independent Samples T-Test	Equal variance
Hom	1.43	0.80	2.06	3.71	—	—
SexV	17.07	21.74	57.90	62.67	-3.01**	assumed
Theft	841.55	922.96	1311.57	860.81	—	—
GDPPC	25881.94	10837.74	42957.49	18352.02	-3.62***	assumed
Inequal	32.99	4.73	30.78	3.31	—	
Unempl	10.47	7.37	8.19	4.98	—	
1Gen_Employ	65.11	4.31	63.41	7.81	-6.86***	not assumed

Note: arithmetic mean of International migrant stock= 11.01; High group of countries >11.01; Low group of countries <11.01
**=*p*< .01; ***p< .001
Table 3. Descriptive statistics

Correlation analyses

Table 4 shows one-tailed bivariate correlations between variables. There is a significant positive correlation between international migrant stock and sexual violence (r = .46, *p*< .003), and theft (r = .46, *p* < .002); there is also a significant positive correlation between GDPPC and both sexual violence (r=.77, p<.001) and theft (r=.75, *p*< .001).

Conversely, there is a significant negative correlation between unemployment rates and both sexual violence (*r* = -.55, *p*< .001) and theft (*r* = -.55; *p*< .001). Income inequality is also negatively correlated with both sexual violence and theft, although the correlation coefficients are small than either GDPPC or unemployment.

		Log Migr_Stock	Log Hom	Log SexV	Log Theft
Log Migr_Stock	r	1	−.188	.461**	.464**
	Sig. (1-tailed)		.14	.003	.002
	N	37	35	35	37
		Log 1Gen_Employ			
Log 1Gen_Employ	r	1	.008	.187	.135
	Sig. (1-tailed)		.484	.181	.256
	N	26	26	26	26
		Log GDPPC			
Log GDPPC	r	1	−.280*	.773**	.748**
	Sig. (1-tailed)		.049	0	0
	N	38	36	36	38
		Log Inequal			
Log Inequal	r	1	.031	−.429**	−.361*
	Sig. (1-tailed)		.436	.009	.023
	N	31	30	30	31
		Log Unempl			
Log Unempl	r	1	.049	−.550**	−.546**
	Sig. (1-tailed)		.388	0	0
	N	38	36	36	38

Note: ** Correlation is significant at the 0.01 level (1-tailed). * Correlation is significant at the p= 0.05 level (1-tailed).
Table 4. Bivariate correlation

As shown in Table 5, partial correlations between international migrant stock and both sexual violence and theft, controlling for both income inequality and unemployment, confirm previous results. Finally, with the exception of a slight but significant negative correlation with GDPPC (r=-.28, p<.05), homicide is not significantly correlated with any of the variables under study.

Control Variables, log Inequal	Log Migr_Stock		Log Hom	Log SexV	Log Theft
Log Migr_Stock		1	−0.17	0.459	0.383
Significance (1-tailed)	.		.193	.007	.022
df		0	26	26	26
Control Variables, log Unempl	Log Migr_Stock				
Log Migr_Stock		1	−0.188	0.553	0.460
Significance (1-tailed)	.		.143	.001	.003
df		0	32	32	32

Table 5. Partial correlation

Regression analysis

Table 6 shows the results of the simple regression analyses. First, the estimated relationships suggest that a 1% increase in international migrant stock increases expected sexual violence by 0.67% ($p< .01$) and expected theft by 0.45% ($p< .01$). The R^2 value indicates that about 22% of the variation in sexual violence and 15% of the variation in theft can be attributed linearly to international migrant stock.

Second, the estimated relationships also suggest that a 1% increase in the GDPPC increases expected sexual violence by 1.86% ($p< .001$) and expected theft by 1.39% ($p< .001$). The R^2 value indicates here that about 62% of the variation in sexual violence and 54% of the variation in theft can be attributed linearly to GDPPC.

Third, the estimated relationships suggest that a 1% increase in income inequality reduces expected sexual violence by 3.77% ($p<.05$) and expected theft by 2.73% ($p<.05$). The R^2 value indicates that about 17% of the variation in sexual violence and 14% of the variation in theft can be attributed linearly to income inequality.

Finally, the estimated relationships suggest that a 1% increase in unemployment reduces expected sexual violence by 1.24% ($p<.001$) and expected theft by .97% ($p <.001$). The R^2 value indicates that about 33% of the variation in both types of crime can be attributed linearly to unemployment.

Homicide does not show significant relationships with any of the independent variables.

	Dependent variables		
Level of immigration	*Log Hom*	*Log SexV*	*Log Theft*
Constant α	.55	1.60**	5.68***
(St. Err.)	(.35)	(.52)	(.44)
Coefficient β log Migr_Stock	−.16	.67**	.45*
(St. Err.)	(.15)	(.22)	(.19)
R^2	.035	.22	.15
(St. Err. of Estimate)	(.72)	(1.08)	(.90)
F	1.17	8.94**	5.83*
N	33	33	33
Level of economic wealth			
Constant α	4.36	−16.22***	−7.70**
(St. Err.)	(2.43)	(2.61)	(.58)
Coefficient β logGDPPC	−.40	1.86***	1.39***
(St. Err.)	(.24)	(.25)	(.22)
R^2	.08	.62	.54
(St. Err. of Estimate)	(.70)	(.75)	(.66)
F	2.93	54.46***	38.87***
N	34	34	34
Level of income inequality			
Constant α	−1.26	15.86**	16.05**
(St. Err.)	(4.21)	(5.47)	(5.56)
Coefficient β log Inequal 2017	.43	−3.77*	−2.73*
(St. Err.)	(1.22)	(1.59)	(1.32)
R^2	.01	.17	.14
(St. Err. of Estimate)	(.79)	(1.03)	(.86)
F	.13	5.65*	4.26*
N	28	28	28
Level of Unempl			
Constant α	.05	5.67***	8.72***
(St. Err.)	(.50)	(.68)	(.54)
Coefficient β log Unempl (St. Err.)	.07	−1.24***	−.97***
	(.77)	(.31)	(.25)
R^2	.003	.33	.32
(St. Err. of Estimate)	(.74)	(.99)	(.79)
F	.09	15.90***	15.13***
N	33	33	33

Significance: ***$p<0.001$; **$p<0.01$; *$p<0.05$

Table 6. Estimated relationships using a *log-log* models (simple regression)

Table 7 shows the results of two the multiple regression models examining sexual violence. Model 1 suggests that, when controlling for income inequality, a 1% increase in international migrant stock increases sexual violence by .52% ($p < .01$). The model also shows that when controlling for international migrant stock, a 1% increase in income inequality, reduces sexual violence by 3.4% ($p=.05$). The R^2 value indicates that about 38% of the variation in sexual violence can be attributed linearly to international migrant stock and income inequality.

Model 2 suggests that, when controlling for unemployment, a 1% increase in international migrant stock, increases sexual violence by .68% ($p=.001$), and when controlling for international migrant stock, a 1% increase in unemployment reduces sexual violence by 1.19% ($p=.001$). The R^2 value indicates that about 50% of the variation in sexual violence can be attributed linearly to international migrant stock and unemployment, indicating the important role of these predictors in explaining the level of sexual violence between countries.

	Dependent variable			
	Model 1 Sex V		*Model 2* *Sex V*	
Constant α (St. Err.)	13.50** (4.88)	Constant α (St. Err.)	3.89*** (.68)	
Coefficient β log Migr_Stock (St. Err.)	.52** (.20)	Coefficient β log Migr_Stock (St. Err.)	.68*** (.18)	
log Inequal (St. Err.)	−3.40* (1.39)	Log Unemployment, 2017 (St. Err.)	−1.19*** (.28)	
R^2	.38	R^2	.50	
(St. Err. of Estimate)	(.89)	(St. Err. of Estimate)	(.87	
F	8.09**	*F*	15.88***	
N	28	*N*	34	

Significance: ***$p<0.001$; **$p<0.01$; *$p<0.05$
Table 7. Estimated relationships using a log-log models (multiple regression)

Discussion and Conclusion

The results of this study indicate that immigrants are more likely to migrate to countries with higher socioeconomic indicators (such as high GDPPC, low income inequality, and low unemployment). Additionally, the study shows a positive linear relationship between immigration level and both sexual violence and theft, but not homicide.

Descriptive statistics suggest that countries with higher international migrant stock have higher levels of crime as compared to countries with low international migrant stock. Correlation analyses indicate a significant positive correlation between GDPPC and both sexual violence and theft as well as a significant negative correlation between unemployment rates and these crimes. The results also indicated that despite varying levels of income inequality and unemployment, both sexual violence and theft, but not homicide, are significantly associated with international migrant stock. However, when a simple linear regression analysis is performed, the results indicate that there is a positive effect of international migrant stock on both sexual violence and theft. A similar relationship is observed between GDPPC and these crimes. Homicide is not significantly related to international migrant stock, unemployment, or income inequality.

The results of the multiple regression analysis confirmed these observed relationships and demonstrated that when controlling for income inequality and unemployment, the effects of international migrant stock on sexual violence remain positive. The results suggest that 50% of the variation of sexual violence can be attributed linearly to international migrant stock and unemployment (instead, 38% of the variation of sexual violence can be attributed linearly to international migrant stock and income inequality).

The results of this research seem to suggest that there is a higher prevalence of sexual violence and theft in rich countries. Additionally, the unemployment rate is significantly and negatively correlated with these crimes. However, the direction of the relationship varies with both the economic indicator and the type of crime being examined. Overall, these findings support earlier research that links increased income inequality to higher levels of crime, suggesting that immigration-related economic inequities may contribute to criminal behaviour.

These results may be interpreted through the lens of two key criminological theories: strain and relative deprivation. Strain theory (Agnew, 2011) emphasizes the impact on behavior of blocked access to legitimate means of achieving social (including socioeconomic) goals. The observed associations between GDPPC, unemployment

rates, income disparity, and crime in countries with a higher GDPPC suggest that individuals, particularly immigrants, who are either unable to obtain employment or are ineligible for employment may experience strain, which may contribute to involvement in crime. Engbersen & Van der Leun's (2001) marginalization thesis suggests that the marginalization experienced by immigrants, particularly undocumented immigrants, creates an increased risk of involvement in crime.

Relative deprivation, which is derived from strain theory, involves perceived inequities or disparities between what one has and what one believes one deserves, particularly when one compares oneself to others (Coccia, 2018; Smith, Pettigrew, Pippen, & Bialosiewicz, 2012). When a perceived disparity is seen as unfair, it may lead to strain and an increased risk of involvement in crime. Relative deprivation theory links crime to subjective perceptions of inequality and thus explains criminality committed by individuals who may not be experiencing actual economic deprivation. Because countries with higher GDPPC are likely to have larger numbers of middle- and upper-class residents, unemployed or underemployed immigrants may experience feelings of relative deprivation when comparing themselves to employed native residents who enjoy a comfortable living (cf., Coccia, 2017, 2018). This socioeconomic disparity may produce feelings of anger, stress, frustration, and helplessness among immigrants, and may increase the likelihood of criminal behavior.

The link between economic inequality and criminal behavior in this study suggests that social policies and programs that focus on providing both economic aid and social support to communities with high levels of immigration and unemployment may be an appropriate method of reducing crime and violence (see e.g., Pratt & Godsey, 2003). In particular, economic policies that are designed to both increase economic prosperity and reduce income inequality may be most effective in lowering cultural deviance, aggression, and violent behaviour in society (see e.g., Daly, Wilson, & Vasdev, 2001; Fajnzylber, Lederman, & Loayza, 2002).

Although this study has provided some interesting, albeit preliminary, results, it has several limitations. First, the cross-national scope of this research presents problems due to variations in data collection and reporting practices across countries. Specifically, the reporting and recording of unemployment data raises a number of questions, as in some countries not all unemployed persons are officially registered. Essentially, in some countries there may be a "dark figure of unemployment" which may help to explain the inverse relationship between unemployment and theft. Second, differences in crime-reporting practices make comparing crime rates across different countries difficult. For example, some countries, such as Poland, consider minor assaults or the theft of an item worth less than a specified amount to be an "offense" or "contravention" rather than a crime. Thus, those countries may not include these acts in their reports to Eurostat, thus reducing their reported rates of these crimes. Third, country-specific social norms may affect the willingness of victims to report certain types of crimes, particularly sexual violence. Obviously, such unreported crimes will not be included in the Eurostat database. Thus, generalizing the results of this research should be done with caution. Finally, the estimated relationships in this study focus on analysis of variables in specific years (which were the recent years available in the database). However, future research should consider more recent data, when available, and when possible should examine time series of variables to provide more dynamic relations of the phenomena under study over time and space.

Despite these limitations, the results presented here clearly illustrate the need for more detailed examinations of the relationship between unemployment, migration and crime over time and space to better understand aggression and crime in the context of immigration. In addition, a detailed statistical analysis of existing crime prevention policies in the EU may provide more information regarding the economic, social, and spatial requirements for controlling crime. The link between immigration and crime should also be examined geospatially, to consider the relationship between crime and community heterogeneity.

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