

CRIMINALITY AND SUICIDE AT THE ONSET  
AND DURING THE FINANCIAL CRISIS  
IN GREECE

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**Abstract**

*Background and objectives:* To examine the relationship between rates of criminality and suicide at the onset and during the financial crisis in Greece.

*Methods:* Crime statistics were taken from the Crime Analysis Section of the Public Security Department of the Hellenic Police Headquarters (n=87,755 for the year 2008, n=121,922 for the year 2011, 38.93% increase). The crimes included in the model were homicide, fraud, rape, extortion, narcotics, weapons, sexual exploitation, thefts/ burglaries and robberies. Crude crime rate is the sum of committed crimes per police region per 100,000 residents. Data regarding the total number of suicides were taken from the Hellenic Statistical Authority (ELSTAT) for the years 2008, 2010 and 2011 (n= 366 for 2008 and n=474 for 2011, increase of 29.51%). After computing criminality rates per 100,000 residents per region, eleven repeated measures analyses of variance were conducted in

order to reveal differences in the rates of crimes and number of suicides among 2008, 2010 and 2011. Three linear regression analyses were employed for the prediction of suicides by crime rate per 100,000 residents at the regional level.

*Results:* With regard to crude crime rate there was a statistically significant increase between 2008, 2010 and 2011 ( $p = 0.001$ ). Moreover, there was a significant increase in crime rates per 100,000 residents for fraud ( $p = 0.001$ ), possession of a weapon ( $p = 0.001$ ), thefts/burglaries ( $p = 0.002$ ) and robberies ( $p = 0.017$ ). There was an upward tendency for homicides ( $p = 0.057$ ) and extortions ( $p = 0.059$ ). However, there was a significant decrease per 100,000 residents of rapes ( $p = 0.044$ ). With regard to suicide, there were no statistically significant differences between 2008, 2010 and 2011. Linear regression analyses revealed a statistically significant relationship between crime and suicide. At the regional level, during the years 2008, 2010 and 2011 increases in suicides were predicted by increases in crimes ( $p < 0.01$ ).

*Conclusions:* There was a significant crime increase in Greece during the financial crisis. The crime increases seem to follow a similar pattern to that of suicides, both at the onset and during the financial crisis.

## Introduction

According to the World Health Organization, “violence is the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, which either results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment, or deprivation” (World Health Assembly, 1990). According to the above definition, violence is both internalized as well as externalized. Suicide rates represent internalized violence while crime rates are manifestations of externalized violence.

There are both theoretical positions and research studies examining the relevance of homicide to subsequent suicides and suicide attempts to subsequent homicides (Chan, Beh and Broadhurst, 2003; Cook, 2012; Jokinen et al., 2009; van Wormera and Odiaha, 1999; Yip et al., 2009). Freud defines suicide as “murder inverted by 180 degrees”. Suicide and war are different aspects of a common problem, as they are expressions of human instinctive aggression and destruction (death instinct) (Freud, 2002; Leenaars, 1993). The severe repression of instincts caused by childhood abuse, viewed from a Freudian perspective, can lead to the emergence of

the instinct of death in distorted form. Menninger suggests that the wish for suicide is composed of three elements: wish for death, wish for murder and wish for self-murder (Menninger, 1938) . According to Rank (1936), the fear of death decreases when someone kills – sacrificing another. Thus, through another person’s death one could symbolically “buy off” the death penalty.

According to Durkheim (1979), “suicide is inversely proportional to the degree of integration of the social groups of which the individual consists a part”. Thus, according to Durkheim, both suicide and crime can be seen as deviations from optimal integration into the wider community.

The aims of this study are to examine the changes in crime and suicide as well as the relationship between them at the onset and during the current financial crisis in Greece.

## **Methods**

Crime data were taken from the Crime Analysis Section of the Public Security Department of the Hellenic Police Headquarters. In order to capture a crude rate of criminality we have created a composite measure which encompasses homicides, fraud, rape, extortion, narcotics, weapons, sexual exploitation, thefts/burglaries and robberies. These individual rates and the crude crime rate were then expressed as incidence per 100,000 residents (Table 1). Suicide data were taken from the Hellenic Statistical Authority (ELSTAT) for the years 2008, 2010 and 2011 (Table 1). The absolute number of suicides was calculated for 14 police regions separately. Repeated measures analyses of variance have been used to test for differences in the rates between 2008, 2010 and 2011. Linear regression analyses tested the prediction of suicide by crime rates in Greece in 2008, 2010 and 2011. For the statistical evaluation the SPSS.20 package was used.

## **Results**

The overall numbers of crimes for the years 2008, 2010 and 2011 were 87,755, 115,327 and 121,922 respectively (increase of 38.93%). The overall numbers of suicides for the years 2008, 2010 and 2011 were 366, 371 and 474 respectively (increase of 29.51%). Eleven one-way repeated measures analyses of variance were conducted to compare the effect of time on number of suicides per region, on crude crime rate and its per

100,000 residents incidence at regional level. There was a significant increase in crude crime rate per 100,000 residents (*Wilks' Lambda* = 0.34,  $F(2,12) = 11.79$ ,  $p = 0.001$ ). Specifically, there was a significant increase per 100,000 residents for fraud (*Wilks' Lambda* = 0.13,  $F(2,12) = 38.76$ ,  $p = 0.001$ ), possession of a weapon (*Wilks' Lambda* = 0.31,  $F(2,12) = 13.32$ ,  $p = 0.001$ ), thefts/burglaries (*Wilks' Lambda* = 0.36,  $F(2,12) = 10.84$ ,  $p = 0.002$ ) and robberies (*Wilks' Lambda* = 0.51,  $F(2,12) = 5.84$ ,  $p = 0.017$ ). There was a substantial but non-significant increase of homicides (*Wilks' Lambda* = 0.62,  $F(2,12) = 3.67$ ,  $p = 0.057$ ) and extortions (*Wilks' Lambda* = 0.49,  $F(2,12) = 4.11$ ,  $p = 0.059$ ). There was not significant effect of time on crime rates per 100,000 residents for narcotics (*Wilks' Lambda* = 0.93,  $F(2,12) = 0.93$ ,  $p = 0.654$ ) or sexual exploitation (*Wilks' Lambda* = 0.67,  $F(2,12) = 2.91$ ,  $p = 0.093$ ). However, there was a significant decrease in crime rates per 100,000 residents of rapes (*Wilks' Lambda* = 0.10,  $F(2,3) = 13.42$ ,  $p = 0.032$ ) (see Table 2).

As for suicide, there was no significant effect of time on the number of suicides (*Wilks' Lambda* = 0.82,  $F(2,12) = 1.32$ ,  $p = 0.304$ ).

Linear regression analysis was used to investigate the prediction, at the regional level, of suicide rates by the crude crime rate per 100,000 residents during 2008.  $R^2$  was 0.54 and *Adjusted R<sup>2</sup>* was 0.50. Therefore 50% of the variance in suicides at the regional level could be predicted by the independent variable. The model was highly significant,  $F(1,12) = 14.00$   $p < 0.01$ . Consequently, the more suicides that appear in a certain region in 2008, the higher crude rate of criminality tends to appear (Table 3).

A similar regression analysis was then done for the year 2010.  $R^2$  was 0.44 and *Adjusted R<sup>2</sup>* 0.40. Again, the model was highly significant:  $F(1,12) = 9.52$ ,  $p < 0.01$ . Consequently, increases in suicide rates were again predicted by increases in crude criminality rates. (Table 3).

Finally, the linear regression analysis was repeated for the year of 2011.  $R^2$  was 0.57 and *Adjusted R<sup>2</sup>* 0.48. The model was again significant:  $F(1,12) = 12.95$ ,  $p < 0.01$ . Consequently, as was the case with the other two years examined, criminality rates predicted suicide rates (Table 3).

## Discussion

As the results of the analysis at the regional level show, there was a significant increase in violence in Greece between 2008 and 2011.

Increases were found in both crimes against property (fraud, theft /burglary) as well as violent crimes (possession of a weapon, homicides).

With regard to crime in Greece, Artinopoulou (2011), also detected an increase. Data from 2000 to 2008 showed an upward trend in offenses against property (fraud, theft /burglary, robbery).

A study that explored the impact of the economic crisis on crime indicators for 2008-2009 at the national level showed that in 7 out of 11 countries impacted by the crisis, there was a systematic increase in at least one criminality rate (UNODC, 2012). In other countries, however, there was no reduction in any of the crime indicators. The largest increase was noted in robberies followed by homicide crimes. The above finding is in agreement with criminological theories according to which, in times of economic stress, an increase in both property crimes and violent crimes is expected (Rodriguez and Larrauri, 2012). Specifically, homicides appeared to be related to economic changes in countries that already presented with high levels of violence such as Brazil, El Salvador and Jamaica (UNODC, 2012).

An increase in homicides, financial crimes, and overall crime rates in times of financial crisis have been highlighted in the literature (Khang et al., 2005; Stuckler et al., 2009; Wilson and Wilson, 2013). Furthermore, there are well-known social costs associated with high and persistent youth unemployment, such as heightened crime rates (Morsy, 2012). According to the Eurostat, Greece youth unemployment rates were 16.8% in 2008, 24.8% in 2010 and 35.4% in 2011.

According to the present study, overall suicide rates have not systematically increased among 2008, 2010 and 2011. The findings of this study confirm the view that there has been a non-directional fluctuation of suicides in Greece over the last decade (Fountoulakis et al., 2012). However, it is well known that periods of financial crises are usually associated with a significant increase of suicides (Chang et al., 1998; Giotakos, 2010; Stuckler et al., 2009a; Stuckler et al., 2009b; Utela, 2010). Recently, other authors have found an increase in suicides over the course of the economic crisis in Greece (Arie, 2013; Fountoulakis et al., 2013; Giotakos et al., 2011; Kentikelenis et al., 2011; Kentikelenis, 2014; Kondilis et al., 2013; Madianos et al., 2014).

In a study of suicide in Greece during the crisis, conducted using a different methodology (i.e., comparison of periods 2001–2007 vs 2008–

2011), an increase in suicides of 27.2% was identified. Moreover, a statistically significant increase in total suicide rates during the crisis for subjects aged 50–54 years ( $t=3.43$ ,  $p=0.007$ ) was found (Kontaxakis et al., 2013). Of course, it should be noted that our study involves only three individual separate years at the onset and during the economic crisis, and not an extended period, before and during the financial crisis.

It is plausible that the impact of crisis depends mainly on its depth and duration as well as on society's ability to develop protective mechanisms for the citizens. It is possible that the impact of the economic crisis on suicide in Greece will show in the coming years (Kontaxakis and Havaki-Kontaxaki, 2012; Mckee et al., 2010).

The limitations of this study concern the small time frame of observation, i.e., only three years of the early phase of the financial crisis. Additionally, the study is correlational and cannot be taken as proof of causal relationships. Extrapolating from the regional to the individual level entails the possibility of committing an ecological error. In ecological correlations the statistical unit is regional population rather than individuals (Robinson, 1950). According to van de Vijver et al. (2008) the ecological correlations tend to be higher than the correlations at the level of individuals.

In conclusion, there was a significant crime increase in Greece during the financial crisis. The crime increases seem to follow a similar pattern to that of suicides, both at the onset and during the financial crisis.

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**Table 1. Crime rates per 100,000 residents and number of suicides per region in Greece among 2008, 2010 and 2011.**

	Crude crime rate per 100,000 residents			N. of suicides		
	2008	2010	2011	2008	2010	2011
West Greece	355.77	931.72	1126.37	33	27	36
Peloponnese	407.19	1012.13	1029.23	29	30	33
Epirus	197.28	343.36	337.74	14	16	13
Central Greece	397.77	699.01	626.34	18	21	23
West Macedonia	138.32	274.00	254.68	8	9	14
East Macedonia and Thrace	185.72	272.78	339.23	14	26	33
South Aegean	345.46	499.92	581.65	18	9	14
Ionian Islands	298.37	752.86	720.42	11	8	9
Central Macedonia	204.73	385.78	537.95	32	24	19
Thessaly	183.81	328.22	286.21	22	34	33
Crete	497.96	852.26	925.63	28	27	37
North Aegean	146.62	184.03	208.73	4	10	4
Attica	1349.09	1596.35	1671.08	111	109	172
Thessaloniki	1246.80	1277.31	1317.17	24	21	34

**Table 2. Change of crime rates per 100,000 residents and absolute number of suicides during 2008, 2010 and 2011**

	2008		2010		2011		Wilks' Lambda	$F(1,12)$	$p$	$\eta^2$
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
Crude crime rate	425.35	386.14	672.12	424.02	711.60	445.62	0.34	11.79	.001	0.66
Homicides	0.92	0.61	1.31	0.54	1.42	0.76	0.62	3.67	.057	0.38
Fraud	5.01	6.67	10.19	7.36	13.57	8.95	0.13	38.76	.001	0.87
Rapes	2.36	2.20	1.93	1.29	1.70	1.45	0.57	4.22	.044	0.43
Extortion	0.83	0.68	1.22	0.77	1.57	1.05	0.49	4.11	.059	0.51
Narcotics	91.70	28.63	92.99	20.91	89.49	20.64	0.93	0.93	.654	0.07
Weapons	25.32	22.57	32.63	26.61	34.30	21.98	0.31	13.32	.001	0.69
Sexual exploitation	2.08	1.59	2.98	2.58	1.66	1.75	0.67	2.91	.093	0.33
Thefts/ burglaries	286.03	346.69	505.94	367.67	534.51	389.36	0.36	10.84	.002	0.64
Robberies	11.26	17.34	23.00	28.67	24.54	31.40	0.51	5.84	.017	0.49
<sup>a</sup> Suicides	26.14	26.01	26.50	25.24	33.86	41.30	0.82	1.32	.304	0.18

<sup>a</sup>Mean number of crimes or suicides per region

**Table 3. Linear regression for the prediction of the number of suicides by the regional crude crime rate per 100,000 residents during 2008, 2010 and 2011.**

Predictor	<i>B</i>	<i>SE B</i>	<i>β</i>
Crude crime rate 2008 <sup>1</sup>	0.05	0.01	0.73
Crude crime rate 2010 <sup>2</sup>	0.04	0.01	0.67
Crude crime rate 2011 <sup>3</sup>	0.07	0.02	0.72

Note:

<sup>1</sup>Dependent variable: 2008 number of suicides (method enter)  $R^2=0.54$   $F(1,12) = 14.00$   $p<0.01$ .

Note:

<sup>2</sup>Dependent variable: 2010 number of suicides (method enter)  $R^2=0.44$   $F(1,12) = 9.52$ ,  $p<0.01$ .

Note:

<sup>3</sup>Dependent variable: 2011 number of suicides (method enter)  $R^2=0.52$   $F(1,12) = 12.95$ ,  $p<0.01$ .

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