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# The 2008 economic recession and the feeling of safety: is anyone still afraid of walking outdoors after dark?

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**Abstract**
Using the theories of General Strain and the Economics of Crime as intermediating mechanisms, I examine whether the 2008 economic recession had any effect on the individual feeling of safety, both short and long term. I use data gathered from 10 countries during 10 rounds of the European Social Survey, from 2002 to 2020/21 ($N$=139741). I apply Interrupted Time Series ordered logit regression models with the gologit2 user-written command for Stata. Results indicate that long-term, there was no adverse effect amongst all the participants in the utilized sample. Short-term however, by 2010, the feeling of safety diminished in those that felt the most secure just before the crisis. Dividing the sample into smaller groups, short-term negative effects were observed in four countries (Switzerland, Hungary, Norway, Portugal), and long-term negative effects in Britain and Ireland. In addition, I found short-term negative effects in groups of individuals who had outlier preferences and personal characteristics. Those were people that trusted the legal system and the police the least, their self- reported happiness level was low, had very conservative political views, had little education and reported having difficulties in coping with their current income.

**Keywords** General strain theory · Economics of crime theory · Feeling of safety · Economic recession · European social survey · gologit2 for Stata

## 1 Introduction

The idea for this paper developed gradually during the last few months. It was a Saturday night at the end of September last year. I had gone out for dinner at the center of the town with colleagues to celebrate the completion of a PhD thesis of a graduate student. Around 23:30, I called it quits. It was a pleasant night, a bit chilly, so I decided to walk home the 5 km distance. As I was half way, I suddenly noticed a car driving slowly next to the pave-

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ment. Inside there were five men, probably in their early 20s. They pulled the car windows down, started swearing, waving and showing me the finger. They must have been under influence. It so happens that at that time of night and away from the center of the town, there are usually very few people walking outdoors. When this occurred, there was actually no one around. Fortunately, the lighting coming from the street lampposts and some shop windows was adequate. I continued to walk at a steady pace and pretended not to notice them. In about 200 m, I was about to turn to a side road. I started contemplating what would happen if that car followed me there as well. After a couple of minutes however, the young men suddenly decided I was not a fun target to bully anymore and drove off.

It was the first time I was involved in such a threatening situation. Nor have I heard from friends and acquaintances anything of the sort. However, I was scared because had these thugs decided to assault me, there was no one around that I could turn to for help. Although I have not reduced my outdoor walks since the incident, when out at night I have become more apprehensive. The experience got me thinking about this "walking at night in the dark" topic, its potential determinants as well as the characteristics of individuals when they are being asked how safe they feel.

If we can somehow measure people's feeling of safety, we can also have an indicator of their well-being. If the resident of a neighborhood is afraid of walking alone at night this denotes problems of freedom, i.e. of socializing and perhaps a sign of deterioration of an area. In many-a-case, it is associated with a declining economic activity, with diminishing property values and with whole areas gradually becoming inhabitable. It generates a spiral situation that feeds itself. It is thus very important to monitor these feelings at regular intervals, both nationally and locally. Public sector officials can then get feedback of what is going "on the street" and perhaps take the necessary corrective actions before the situation deteriorates further.

The feeling of safety is a very popular topic of research in many academic disciplines including sociology, criminology, political science, economics and psychology. When it comes to economics in particular, some scholars assert that the feeling of safety correlates directly with the prevailing economic conditions. In a recession, governments on one hand need to implement restrictive measures to curb spending and on the other to revitalize the economy. For example, spending cuts can be traced all the way down to less policing and smaller maintenance programs of public infrastructure. Economic downturn also means increased unemployment and in some instances, rising in criminal activity. All this contributes to a lower feeling of safety and can be manifested when one walks alone outside in the dark.

There is empirical evidence nonetheless that the aforementioned claims many times do not hold. Some other researchers investigating the relationship of criminal activity and economic business cycles have found that the former does not increase in recessions. If this is true and taking under consideration the hypothesis that crime correlates with the feeling of safety, then the feeling of safety should not be affected by a deteriorating economic climate.

The data I utilize in this paper is based on responses gathered from individuals participating in the European Social Survey (ESS). The respondents resided in ten European countries: Belgium, Switzerland, Finland, United Kingdom, Hungary, Ireland, Netherlands, Norway, Portugal and Slovenia. I chose these countries because they participated in all ten rounds of the survey during the period 2002 to 2020/21. The ESS has a question asking its participants their feeling of safety when walking alone in a local area after dark. There

are four options to choose: Very unsafe, Unsafe, Safe and Very safe. I measure how the economic recession of 2008[1] affected their reported level of safety in these ten European countries dynamically; that is, short and long term. The 2008 crisis was a global event, exogenous in origin for most countries. To depict it, I form time variables to define specifically the periods before and after the crisis erupted in 2008. In other words, my dependent variable is the individual feeling of safety and the independent variables of interest are these time variables. I compare the results amongst the aforementioned 10 countries for any significant differences. I also investigate whether the feeling of safety of certain subgroups of the sample at hand abide or diverge from the results where all the data is analyzed.

Next, I mention the basic theoretical framework which I utilize in relation to the topics of economic recession, strain, crime and safety. I refer to literature investigating whether the feeling of safety reported by residents correlates adversely with the level of crime at their neighborhood. Furthermore, I list papers that examine if the level of crime is associated with the prevailing economic conditions, both locally and nationally. In the methods section, I describe in detail the logic behind the statistical models built, the dependent and independent variables used and commend on the results. In the last part of the paper, I summarize the findings, point to certain caveats, ponder on possible future research and discuss policy implications.

## 2 Theories and literature review

### 2.1 Association between the feeling of safety and economic recession

The aim of the paper is to investigate whether the recent economic recession had any effect on the feeling of safety of individuals. Hence, a basic definition here is appropriate. According to the National Bureau of Economic Research (NEBR), "A recession is a significant decline in economic activity spread across the economy, lasting more than a few months, normally visible in real GDP, real income, employment, industrial production, and wholesale-retail sales."[2]

Common sense says that you feel unsafe if you think you are about to be hurt physically. The more probable the assault, the more unsafe you feel. This happens for example if you walk at night in a neighborhood where the crime rate is high. Sociologists and economists have come up with theories as to why all this might be the case. One explanation is that in economic recessions people are deprived of economic means, their quality of life diminishes and attempting to improve it, they turn to crime. During such periods, anomie (lawless) proliferates. In other words, villains increase, so does crime, and so does your feeling of being unsafe. Becker (1968) described this type of behavior in his Economic of Crime Theory (EOC). Becker argued that those that consider engaging in a criminal activity attempt to maximize their self-interest (utility) based on the limitations of the environment they function. In a recession these limitations can affect their lives negatively thus they seek

[1] In this paper, I use the names "economic recession of 2008", "economic crisis of 2008", "economic downturn", "financial crisis of 2008", "recession" and "crisis" interchangeably. The same holds for "feeling of safety" and "safety".

[2] https://www.nber.org/news/business-cycle-dating-committee-announcement-january-7-2008.

other ways to improve it, but always taking under consideration the risks involved i.e. getting caught. (Rubin 1978, p.38).

Another approach is to apply the famous Strain theory first introduced by Merton (1938), subsequently altered and improved by many (e.g. Cohen 1955; Cloward and Ohlin 1960, Agnew 1985; Agnew 1992)[3]. In his General Strain Theory (GST) Agnew (2001, p.338) suggested that "…strainful events and conditions are most likely to lead to crime when they (1) are seen as unjust, (2) are seen as high in magnitude, (3) are associated with low social control and (4) create some pressure or incentive for criminal coping." An economic recession is by definition a phenomenon that fulfills Agnew's conditions, thus could indeed increase crime and decrease the feeling of safety.

The diminishing feeling of safety during economic recessions is not linked solely to the fear of being physically assaulted due to the generated lawless. The Economic Insecurity (EI) theory posits that since economic recessions result in job losses, the possibility of becoming unemployed and the financial hardships that may follow, can diminish an individual's overall feeling of safety and stability (Hacker et al. 2014; Rohde and Tang 2018; Ranci et al. 2021). In addition, the Conservation of Resources (COR) theory says that individuals are naturally inclined to protect their valuable assets they have obtained throughout their working life. Hence, in an economic recession the threat of losing these belongings increases their anxiety, which in turn affects negatively the individual's feeling of safety (Hobfoll 1989; Halbesleben et al. 2014). One might interpret these two latter theories as no more than specialized variations of the Strain theory because of the anxiety they generate.

In Fig. 1, I depict in a simplified way the direction of the associations between an economic recession, crime, strain, and the feeling of safety. I hypothesize that an economic recession affects the feeling of safety of individuals through the intermediating mechanisms proposed by the four aforementioned theories. Next, I refer to literature that examines these associations.

### 2.2 Association between economic recession and crime

Levitt (2004) concluded that a strong economy does not seem to play a role in the decrease of crime in the 1990s. Arvanites and Defina (2006, p.139) wrote that " Statistical models indicate that the strong economy of the 1990s reduced all four index property crimes and robbery by reducing criminal motivation". The British newspaper Guardian reported on April 24, 2009 "Recession bites as thefts and burglaries rise. An unexpected 25% increase in personal thefts and a 4% rise in domestic burglaries in the official quarterly crime figures published yesterday confirmed predictions that the recession and rising joblessness will fuel a rise in property crime. The 4% increase in break-ins for the second successive quarter, spanning last summer and winter, marks the end of a sustained 55% fall in burglaries in England and Wales since the mid-1990s."[4] A report by the United nations office on drug and crime (Malby and Davis 2012) noted that in 11 of the 15 countries examined, violent property crime types such as robbery appeared most affected during times of crisis, with up to two-fold increases in some contexts during a period of economic stress. Rosenfeld (2014, p.4) commented: "For some criminologists and other observers, the absence of crime

[3] For a comprehensive list of these theories and empirical research testing them see e.g. Agnew (2001) and Jang and Agnew (2015).

[4] https://www.theguardian.com/uk/2009/apr/24/crime-figures-burglary-theft-rise, accessed 15.11.2024.

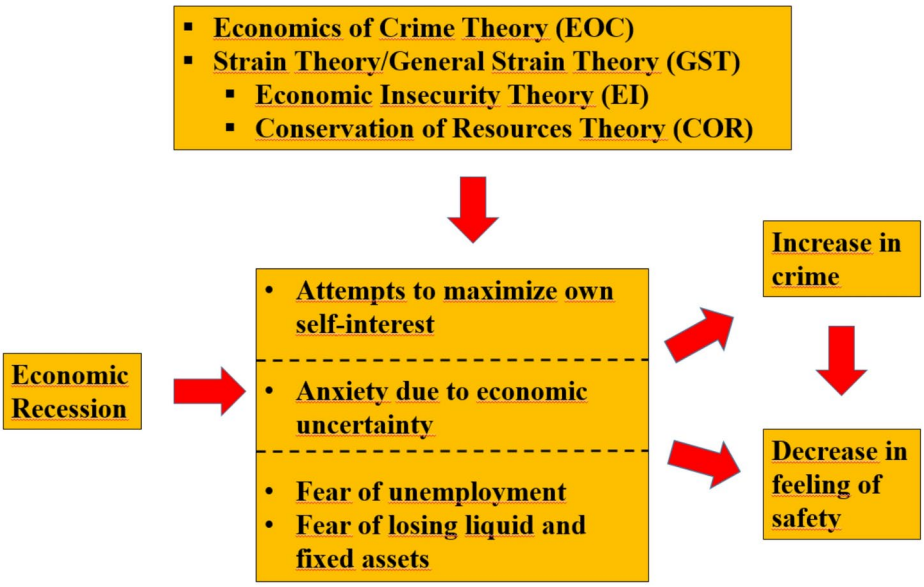


**Fig. 1** Theories and direction of the association between an economic recession, crime, strain, and feeling of safety

increases during the Great Recession simply confirmed their belief that crime has little to do with economic conditions. This view, however, is not supported by recent studies showing that crime rates increase as economic conditions worsen and decrease as they improve."

In his master's thesis Kurtz (2015, p.2) concluded that "Contrary to the Economic Theory of Crime, I find that declining macroeconomic conditions due to the 2008 recession such as rising unemployment rates and declining GDP per capita have no statistically significant effect on property, violent, or total crime over the same time period. Because the hypothesized effect does not occur, I conclude that the Economic Theory of Crime does not hold during the Great Recession".

Bushway et al. (2013, p.23) stated "… economic downturns result in increases in burglary, robbery, and suicide rates; decreases in motor-vehicle theft; and no significant change in homicide rates." Greece was one of countries that suffered the most from the economic recession of 2008. Tsouvelas et al. (2018) examined whether the financial crisis in Greece coincided with an increase in crime. They analyzed crime rates since the start of the crisis and over an extensive time-period (7 years). They found a reversed U shape for homicides, thefts and robberies, with rates peaking in 2010 and 2012 before dropping off in 2014. Using Swedish data, Granath (2021) investigated the impact of the 2008 financial crisis on crime rates in several Swedish municipalities. He reported no significant changes on any crime category. Barry Latzer (2021) wrote, "The main factor is that violent crimes (except robbery) are not, by and large, motivated by economic concerns. Murder and assault tend to be precipitated by anger, sexual jealousy, perceived insults and threats, long-standing personal quarrels, and similar issues, frequently facilitated by alcohol or some other disinhibiting substance"[5]. Finally, Torres-Tellez and Soler (2023) examined the crime rate in Spain dur-

[5] https://lsupress.org/do-hard-times-cause-crime-the-lessons-of-history/, accessed 15.11.2024.

ing the 2008 recession. Albeit the fact that Spain, as Greece, was hit hard by the economic downturn they found no association between crime rates and worsening economic conditions. They mentioned among others that "…in the face of worsening economic conditions, no evidence of a positive and uniform effect on the crime rate is detected." (ibid., p.223)

### 2.3 Association between crime and the feeling of safety

Mason et al. (2013, p.15) noted that "…feelings of personal safety (feeling safe in the home and if walking alone in the local area at night) were consistently associated, respectively, with less and more frequent walking… … a small but significant association between walking frequency in neighborhoods with higher recorded person crime.". Forde (1993, p.407) on the other hand found the opposite. "Analysis suggests that perceived crime in the city and in Canada were not associated with fear of crime and walking alone at night; perceived crime in respondents' neighborhoods showed a weak association". Investigating the same subject, Temelová et al. (2016) asserted that there is a strong correlation between feeling of safety and crime and high feelings of safety in low-crime suburban districts. Finally, Velasquez et al. (2021, p.1) reported "…those with and without functional limitations felt less safe in areas with more crime and perceived as more disordered."

As can be seen, empirical evidence regarding the two aforementioned associations is inconclusive. For the purposes of this paper nonetheless, I assume that (a) economic conditions affect crime and (b) the level of crime correlates inversely with the feeling of safety. The four theories I briefly described earlier support these two assumptions. Thus, since adverse economic conditions increase crime and more crime translates into reduction of safety, I hypothesize that economic conditions also affect the feeling of safety at the individual level. I investigate empirically whether this holds using data from the ESS. Next, I list the variables in my regression models and then describe in detail the quantitative methods implemented.

## 3 Data, variables and methods

The period examined uses data gathered during ten biennial survey rounds of the ESS, from 2002 to 2020/21. In the survey, the same questions were asked in each round, using different representative random samples from the population of the 10 countries listed earlier. In other words, I use time series data, which at the individual level is not a panel.

### 3.1 Dependent variable

To reiterate, the purpose of this empirical paper is to measure whether economic conditions, in particular the financial crisis of 2008, had any effect on the feeling of safety walking outdoors at night. My dependent variable is based on responses to the question "How safe do you - or would you - feel walking alone in this area after dark?" with four reply options: Very unsafe, Unsafe, Safe, Very safe. The responses are ordered thus as will be shown below, in my analysis I run ordered logit models. The coefficients generated by these models are estimations of how, for one unit increase in the independent variable, the dependent variable is expected to change by its respective regression coefficient, while the other control

variables in the model stay at constant values. Note that the generated coefficients are in the ordered log-odds scale. In the analysis that follows, I focus on their sign and on their statistical significance, if any.

### 3.2 Methods and independent variables of interest

As my basic independent variable of interest, I utilize the continuous version of the ESS round variable with values ranging from 1 to 10. I construct two more time related variables that capture the potential effect of the 2008 crisis on the feeling of safety dynamically, that is, both short term and long-term. When it comes to the former, I measure the difference of safety recorded in 2010 (immediately after the crisis) and compare it to the safety levels in 2008. In my long-term analysis, I measure the rate of growth of safety in log odds (positive or negative) during the period before the 2008 crisis as well as during the period afterwards. I then examine whether these two rates differ in a statistically significant way. This methodological approach is called "Interrupted Time Series design" (ITS). It is used frequently in medical and pharmaceutical research to test the effects of different drugs on test animals and treatments on patients (see e.g. Ewusie et al. 2020; Turner et al. 2021)[6].

In this paper, I use the economic recession of 2008 as the "treatment". I measure its effects through the three time-relevant variables. As in Venetoklis (2021, p.1984) the basic regression model is the following:

$Y = b_0 + b_1 * \text{Time} + b_2 * \text{Diff} + b_3 * \text{GrowthD} + (b_{4 \ldots} b_n) * \text{controls} + \text{error}$, where

Y depicts the four levels of the feeling of safety and is the dependent variable I described earlier. It takes the ordered values 1 (Very unsafe), 2 (Unsafe), 3 (Safe) and 4 (Very safe).

Time is one of the three independent variables of interest. It is a continuous variable with values from 1 to 10, representing the ten ESS survey rounds. Its $b_1$ coefficient is the slope of the level of safely for the period before the economic recession erupted in 2008, that is, during the survey years 2002, 2004, 2006 and 2008. The slope is in log-odds.

Diff is a binary variable. It depicts the two periods, before and after the financial crisis and is the second independent variable of interest. It takes the value 0 if the ESS round is 1 to 4 (2002–2008), and 1 if the ESS round is 5 to 10 (2010–2020/21). Its coefficient $b_2$ denotes the change (difference) in the mean value of the feeling of safety immediately after the financial crisis; that is it shows how the feeling of safety changed, between round 4 (2008) and round 5 (2010), always in log odds.

GrowthD is the third independent variable of interest and another time variable. It is associated with the two periods, before and after the 2008 crisis. It takes the value 0 if the ESS round is 1, 2, 3 or 4 (2002–2008) and the values 1 to 6 if the ESS round is 5, 6, 7, 8, 9 and 10 respectively (2010–2020/21). Its coefficient $b_3$ denotes the difference in log odds (growth) after the crisis versus the log odds before the crisis.

### 3.3 Control variables

To generate coefficients depicting an unbiased relation between our dependent and our independent variables of interest, we need to add to our model's right hand side several other control (independent) variables that theoretically may also be associated with the feeling of

[6] Other disciplines have used the ITS method as well. For example, in Education see Gopalan et al. (2020) and in Social Work see Thyler (2012).

safety. Since I assume the feeling of safety and the level of crime correlate, I refer to variables used as control in models where crime is the dependent variable of interest.

Velasquez et al. (2021) concluded that feeling of being unsafe in one's neighborhood is related to poor health. The same has been found in other longitudinal studies earlier (see for example Stafford et al. 2007; Jackson and Stafford 2009). Financial stress due to unemployment caused by the 2008 economic recession can manifest itself indirectly into physical health problems and phobias, one of which is walking alone at night. Conversely, stress can be alleviated through social capital activities, among which one is active interaction with friends and relatives (Frank et al. 2014; French 2018). Some assert that unemployment itself is a good predictor of crime. Behind this is the Economics of Crime theory discussed earlier. In periods of economic recession there are less jobs available, thus people may commit crimes to compensate for their income. When the economy recovers, crime falls because the penalty of being caught is too high compared to the income from working legitimately (Freeman 1996). Choi and Matz-Costa (2018) found that perceived neighborhood safety was associated in statistically significant way with psychological health and physical functioning and the effect was greater in older adults. Also, Kubíčková et al. (2022) investigated the factors that affect the feeling of safety amongst elderly Czechs. Among others, they mentioned that the fear in these seniors increased with age. Hart et al. (2018, p.1) reported, "Individuals who perceived their neighborhood to be safer, more functional and more aesthetic were more likely to be very happy." Ho and McKean (2004) found that confidence in the police and risk perceptions are negatively correlated. Thus, the feeling of safety is also related to how the respondents think of police operations. Blanco and Ruiz (2013) wrote that crime is associated with less trust in a country's institutions. Also, van Prooijen et al. (2022, p.66) argued that if people are suspicious of their country's institutions, they feel less protected by them and this is manifested in less interpersonal trust. Furthermore, political orientation seems to associate with one's feeling of safety. According to Duckit et al. (2002, cited in Napier et al. 2018, p.187) "… conservatives (vs. liberals) perceive the world as a more dangerous place". Putrik et al. (2019) measured the feeling of safety in a Dutch municipality. In their models, the dependent variable was the same as in this paper. For controls, they used socioeconomic characteristics of the respondents including age, gender, level of education and income group. In addition to the aforementioned control variables, in my basic model specification I included a categorical variable depicting the 10 countries in the sample. I did this for comparison purposes, but also to control for certain latent conditions that are unique in each country and might have affected the feeling of safety of their residents.

### 3.4 Variables not used in the final model specification

Holmberg (2005) noted that in the Nordic countries citizens assumed that their perception of safety enhances with more "proximity" policing. Piza and Chillar (2021) examined the effects of police layoffs on crime rates due to the economic recession of 2008. They observed significant increases in crime in the post-layoff period. Piroozfar et al. (2019) reported that there is a positive correlation between the length of residency in an area and the fear of crime. In addition, street lighting seemed to affect the feeling of security when walking in the neighborhood. Mouratidis (2019) found that neighborhoods with higher tree cover are perceived as safer than those with lower tree cover. Wu et al. (2022) on the other

hand described that street safety is relatively low in areas with lack of street interface, large amount of transit traffic and high-density vegetation cover. Rustenbach (2010) investigated sources of negative attitudes towards immigrants in Europe. One of the determinants they found is neighborhood safety. Finklea (2011) discussed the link between economic downturn and crime. She alleged that the GDP of a country maybe a better macroeconomic predictor of crime. She also noted that in some cases, foreclosures resulting from economic recessions increase violent crimes in neighborhoods. Rosenfeld and Levin (2016) examined several macroeconomic indicators that might be connected with crime, including unemployment, GDP, inflation, income and consumer sentiment. They found that inflation is the only indicator that is correlated with the levels of crime in a statistically significant way. They explained that, as market prices spiral upwards demand for stolen goods increases.

In the ESS, there are unfortunately no data depicting neighborhood characteristics. There are no variables depicting police presence, street lightening and length of residency, density of vegetation, foreclosures, or percentage of immigrants residing in the same neighborhood as that of the respondent. Regarding the two aforementioned macroeconomic indicators, I added those to my ESS database from the databanks maintained by the OECD and World Bank[7]. Initially, in my basic regression model, I included as controls both the GDP and the Inflation indicator for each country and for each round and I run two models. I tested two specifications: first with their values for each round at year t and then at year t-1. In both cases, the coefficients came statistically insignificant. I decided not to include them in the final model specification shown in the next section. Table 1 lists all the dependent and independent variables used in the models presented next.

## 4 Results

In Fig. 2, I depict graphically the level of safety amongst the ten countries in my data. Note that although the number of countries participating in all of the 10 ESS rounds is 16, only those 10 had non-missing values for all the variables utilized in my model specifications. Albeit some variation, the slopes of the lines fitted indicate a positive trend in all countries. In other words, during the 20-year period investigated, the feeling of safety at individual level seems to be growing, overall.

What happens to the feeling of safety if we were to apply non-parametric methods, using control variables and taking under consideration the crisis erupted in 2008? I initially run the ordered logit Model 1 (Table 2) with the dependent variable and all the independent variables listed in Table 1. The ESS recommends that weights be used at all times, regardless of whether data from one or from many countries are analyzed. Based on Kaminska (2020), in all my regressions I used post-stratification weights provided by the ESS. In addition, the ITS method requires a minimum of eight time observations before and after the intervention one attempts to measure (Penfold and Zhang 2013). For the purposes of this paper, the intervention is the financial crisis of 2008, and in the data utilized there are 10 such observational instances (four rounds prior and six rounds after the financial crisis). Thus, initial estimations may result in confidence intervals, which are too narrow. In such a case, Efron and Tibshirani (1994) suggest that the ITS model estimates are generated using repeated samples with bootstrapping. In almost all models shown, I used 400 repetitions.

[7] https://data.oecd.org/ (for GDP); https://data.worldbank.org/; (for Inflation)

**Table 1** Dependent and independent variables of the study ($N = 139741$)

| Dependent variable | Mean | S. dev. | Min | Max |
|---|---|---|---|---|
| How safe do you - or would you - feel walking alone in this area after dark? 1 (Very unsafe) 2 (Unsafe) 3 (Safe) 4 (Very safe) | 3.092 | 0.747 | 1 | 4 |
| **Independent variables of interest** | | | | |
| **Time** (The 10 ESS rounds 1 to 10) | 5.395 | 2.836 | 1 | 10 |
| **Diff** (0 if ESS round 1 to 4; 1 if ESS round 5 to 10) | 0.590 | 0.492 | 0 | 1 |
| **GrowthD** (0 if ESS round 1 to 4; 1 to 6 if ESS round 5 to 10 respectively) | 2.013 | 2.119 | 0 | 6 |
| **Control variables** | | | | |
| Country 1 (BE) 2 (CH) 3 (FI) 4 (GB) 5 (HU) 6 (IE) 7 (NL) 8 (NO) 9 (PT) 10 (SI) | 5.202 | 2.723 | 1 | 10 |
| Main Activity 0 (Work) 1(Unemployed) 2(Outside labor markets) 3(Other) | 0.845 | 0.984 | 0 | 3 |
| Trust in people 0 (You can't be too careful) − 10 (Most people can be trusted) | 5.491 | 2.334 | 0 | 10 |
| Trust in legal system 0 (No trust at all) − 10 (Complete trust) | 5.568 | 2.509 | 0 | 10 |
| Trust in police 0 (No trust at all) − 10 (Complete trust) | 6.506 | 2.292 | 0 | 10 |
| Trust in politicians 0 (No trust at all) − 10 (Complete trust) | 4.069 | 2.320 | 0 | 10 |
| Gender 1(Male) 2(Female) | 1.517 | 0.500 | 1 | 2 |
| How religious are you 0 (Not at all religious) − 10 (Very religious) | 4.699 | 2.944 | 0 | 10 |
| Age | 51.061 | 16.897 | 16 | 90 |
| How happy are you 0 (Extremely unhappy) − 10 (Extremely happy) | 7.560 | 1.783 | 0 | 10 |
| How often socially do you meet with friends, relatives or colleagues? 1 (Up to Once/month) 2 (Several time/week) 3 (Up to every day) | 2.257 | 0.748 | 1 | 3 |
| Political ideology placement on left - right scale 0 (Left) 10 (Right) | 5.188 | 2.089 | 0 | 10 |
| Years of full-time education completed | 12.747 | 4.221 | 0 | 30 |
| Subjective general health 1 (Very good) 2 (Good) 3 (Fair) 4 (Bad/Very bad) | 2.136 | 0.847 | 1 | 4 |
| Feeling about household's income nowadays 1 (Living comfortably on present income) 2 (Coping on present income) 3 (Difficult on present income) 4 (Very difficult on present income) | 1.849 | 0.810 | 1 | 4 |

Source: European Social Survey

### 4.1 Results regarding the control variables

The results of Model 1 confirmed the country variability shown graphically in Fig. 1. There were some statistically significant differences between the 10 countries in their feeling of safety levels. There were also differences based on whether the respondents were active in the labor market or not. The more people trusted other people, the police and the legal system, the safer they felt. When it comes to trust towards politicians however, it was the other way. Compared to women, men felt safer walking in the dark. The association of feeling of safety and age was curvilinear as depicted by its two terms. The feeling of safety increased up to a certain age, but as the respondents got older, it diminished. The happier a person was, the more safe he/she felt walking outdoors in the dark. Sociability associated positively

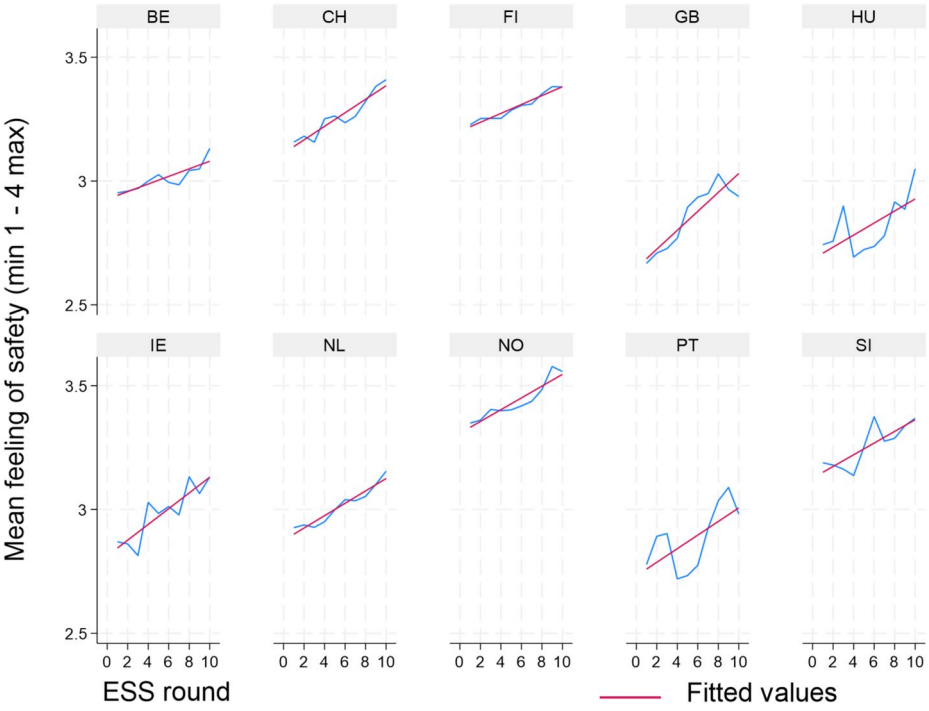


**Fig. 2** Feeling of safety per country during the period 2002–2021. Source: European Social Survey

with safety. Compared to those that met with friends not as often, those that did, were afraid apparently the least. The more conservative views one had, the more unsafe he/she was. Those who considered themselves heathy felt much safer walking in the dark. The same was for the variable depicting one's economic status. If you replied that you lived comfortably on your present income, you most probably felt much safer walking in the dark compared to those that reported making end meet with great difficulty. In general, the results of the control variables abide with previous theory and empirical results investigating the same topic.

### 4.2 Results regarding the independent variables of interest

The log odds of feeling safe before the 2008 crisis (Time) increased and the increase was statistically significant. Immediately after the crisis, the feeling of safety (Diff) stayed flat. Although the sign of its coefficient was negative, it was not statistically significant. Put differently, at first glance it seems that the 2008 crisis had no short-term effect, overall. Looking at the difference in log odds between the period after the crisis and the one before (GrowthD), we see an increase. That is, the feeling of safety did not decrease, it did not grow at the same rate, but it increased even faster than during the pre-crisis period. This is implied by the statistical significance of the GrowthD coefficient. This latter finding is in conformity with a recent OECD report according to which, the overall feeling of safety has risen in recent years. In 31 OECD countries examined, 71% of people overall felt safe when walking alone at night, up from 67% in 2010-12 (Zanden et al. 2020).

**Table 2** Basic interrupted time series ordinal logit model using all the data

| Model 1 | | | | | | |
|---|---|---|---|---|---|---|
| Weights: Yes | | | | | | |
| Bootstrapping: Yes | | | | | | |
| Stata command: ologit | Coeff. | Std. Err | z | P>z | C I | |
| **Independent variables of interest** | | | | | | |
| **Time**: Log odds before the crisis | 0.049 | 0.008 | 6.002 | 0.000 | 0.033 | 0.065 |
| **Short term impact of crisis** | | | | | | |
| Year 2008 (Ref.) | 0.000 | | | | | |
| **Diff**: Log odds difference of Year 2010 vs. 2008 | -0.021 | 0.022 | -0.934 | 0.350 | -0.064 | 0.023 |
| **Long term impact of crisis** | | | | | | |
| **GrowthD** Difference of log odds after the crisis vs. before the crisis | 0.021 | 0.009 | 2.265 | 0.024 | 0.003 | 0.040 |
| **Control variables** | | | | | | |
| **Country** | | | | | | |
| 1 (BE – Ref.) | 0.000 | | | | | |
| 2 (CH) | 0.567 | 0.024 | 23.186 | 0.000 | 0.519 | 0.615 |
| 3 (FI) | 0.682 | 0.025 | 27.805 | 0.000 | 0.634 | 0.73 |
| 4 (GB) | -0.318 | 0.026 | -12.148 | 0.000 | -0.369 | -0.267 |
| 5 (HU) | -0.200 | 0.027 | -7.330 | 0.000 | -0.253 | -0.146 |
| 6 (IE) | -0.011 | 0.026 | -0.423 | 0.672 | -0.061 | 0.039 |
| 7 (NL) | -0.094 | 0.021 | -4.459 | 0.000 | -0.136 | -0.053 |
| 8 (NO) | 0.956 | 0.027 | 35.521 | 0.000 | 0.903 | 1.008 |
| 9 (PT) | 0.177 | 0.028 | 6.354 | 0.000 | 0.122 | 0.232 |
| 10 SI) | 0.930 | 0.026 | 35.819 | 0.000 | 0.879 | 0.981 |
| **Main Activity** | | | | | | |
| 0 (Work – Ref.) | 0.000 | | | | | |
| 1(Unemployed) | 0.038 | 0.031 | 1.222 | 0.222 | -0.023 | 0.098 |
| 2(Outside labor markets) | -0.107 | 0.018 | -5.882 | 0.000 | -0.142 | -0.071 |
| 3(Other) | 0.053 | 0.05 | 1.045 | 0.296 | -0.046 | 0.151 |
| **Trust** | | | | | | |
| Trust in people | 0.096 | 0.003 | 30.928 | 0.000 | 0.09 | 0.102 |
| Trust in legal system | 0.035 | 0.004 | 9.094 | 0.000 | 0.027 | 0.042 |
| Trust in police | 0.021 | 0.004 | 5.283 | 0.000 | 0.013 | 0.028 |
| Trust in politicians | -0.011 | 0.003 | -3.22 | 0.001 | -0.018 | -0.004 |
| **Gender** | Coeff. | Std. Err | z | P>z | C I | |
| 1(Male – Ref.) | 0.000 | | | | | |
| 2(Female) | -1.001 | 0.012 | -82.371 | 0.000 | -1.025 | -0.977 |
| | | | | 0.000 | | |
| **How religious are you** | -0.018 | 0.002 | -8.322 | 0.000 | -0.023 | -0.014 |
| **Age** | 0.046 | 0.002 | 21.086 | 0.000 | 0.042 | 0.050 |
| **Age*Age** | 0.000 | 0.000 | -22.735 | 0.000 | -0.001 | 0.000 |
| **How happy are you** | 0.062 | 0.004 | 14.478 | 0.000 | 0.054 | 0.070 |
| **How often do you meet socially with friends**, etc. | | | | | | |
| 1 (Up to Once/month – Ref.) | 0.000 | | | | | |
| 2 (Several time/week) | 0.014 | 0.016 | 0.92 | 0.357 | -0.016 | 0.045 |

**Table 2** (continued)

| Model 1 | | | | | | |
|---|---|---|---|---|---|---|
| 3 (Up to every day) | 0.144 | 0.017 | 8.299 | 0.000 | 0.11 | 0.178 |
| **Political ideology on left - right scale** | -0.014 | 0.003 | -4.938 | 0.000 | -0.019 | -0.008 |
| **Years of full-time education completed** | 0.015 | 0.002 | 9.309 | 0.000 | 0.012 | 0.019 |
| **Subjective general health** | | | | | | |
| 1(Very good - Ref) | 0.000 | | | | | |
| 2(Good) | -0.528 | 0.016 | -33.671 | 0.000 | -0.558 | -0.497 |
| 3(Fair) | -0.678 | 0.02 | -33.519 | 0.000 | -0.718 | -0.639 |
| 4 (Bad/Very bad) | -0.812 | 0.034 | -23.936 | 0.000 | -0.879 | -0.746 |
| **Feeling about household's income** | | | | | | |
| 1 (Living comfortably – Ref.) | 0.000 | | | | | |
| 2 (Coping with present income) | -0.142 | 0.014 | -10.432 | 0.000 | -0.169 | -0.116 |
| 3 (Difficult with present income) | -0.230 | 0.023 | -10.003 | 0.000 | -0.275 | -0.185 |
| 4 (Very Difficult with present income) | -0.323 | 0.039 | -8.188 | 0.000 | -0.400 | -0.246 |
| /cut1 | -2.143 | 0.079 | | | -2.298 | -1.988 |
| /cut2 | -0.110 | 0.079 | | | -0.264 | 0.044 |
| /cut3 | 2.782 | 0.078 | | | 2.629 | 2.936 |
| N | 139,741 | | | | | |
| aic | 264,659 | | | | | |
| bic | 265,023 | | | | | |
| Pseudo R2 | 0 0.101 | | | | | |

Note: Dependent variable is the feeling of safety: 1 (Very unsafe) 2 (Unsafe) 3 (Safe) 4 (Very safe)

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

Source: European Social Survey

### 4.3 The parallel lines / parallel regression assumption

For the aforementioned model's coefficients to be unbiased, the potential effect of the predictors on the ordered dependent variable needs to be similar both in magnitude and in statistical significance also across the collapsed groups of the ordered dependent variable. This is the so-called "parallel lines" or "parallel regressions" assumption (Williams 2006). Brant (1990) proposed a method with which one can test whether this assumption is violated. Stata has a user-written post estimation command called -surprisingly- brant (Long and Freese 2014). The test can generate an overall statistically significant result if the parallel lines assumption is indeed violated. It also indicates which of the coefficients of the control variables are biased. However, the brant command cannot function if the model tested includes weights and/or is bootstrapped. To check for the parallel lines assumption, I run once more Model 1 without applying weights or bootstrapping (not shown). In that model, the coefficients generated were similar in magnitude, sign and statistical significance as with Model 1. The brant test I run afterwards came statistically significant (Chi2: 4935.66; p > chi2: 0.000; df:68).

Another user-written command called gologit2 (Williams 2016) may account for the bias indicated by the brant test. gologit2 can adjust the coefficients of the control variables in the original ordered model to reflect more accurately their potential effects on the dependent variable. Instead of the original ordered logit model with M ordered dependent variable categories, gologit2 generates separate M-1 binary logit models. It collapses the original

ordered dependent variable into combinations of binary ones. In our case, gologit2 initially collapsed the four categories of the dependent variable feeling of safety (1 Very Unsafe, 2 Unsafe, 3 Safe, 4 Very Safe) and created three separate binary dependent variables. Then, it compared in turn the effects of the independent variables at the category 1 versus 2, 3 and 4, at 1 and 2 versus 3 and 4 and finally at 1, 2 and 3 versus 4. (Table 3).

In the first binary logit Model (2a), there were no effects generated, either short or long term. In the second model (2b), there was no short-term effect but a positive long-term effect. In Model 3c, the independent variables of interest now indicated a short-term negative effect, which had not been captured by the original ordered logit Model 1. It now seems that, overall, the economic crisis effected short term those that in 2008 felt very secure walking alone at night. By 2010, this group's feeling of safety decreased significantly compared to the feeling of safety of the other three groups combined.

### 4.4 Analysis of subgroups in the sample

Are there special cases where the effects of the 2008 crisis on the feeling of safety differ from these depicted in Models 2a, 2b and 2c? Recall that I am particularly interested in the *negative* effects of the crisis. I hypothesized that if I run the same Model 2 but now based solely on a single characteristic of the control variables, I may identify such cases. I thus divided the sample into subgroups based on the control variables listed in Table 1 and run same Model 2 specification using each subgroup's data. I defined these groups by aggregating all control variables that had values from 0 to 10 into three cohorts 0–4, 5–7 and 8–10 in an attempt to have similar number of observations per group. I also divided the variable Age based on whether the respondent was 20 years or under, 21 to 30, 31 to 40, 41 to 50, 51 to 65, and 66 and older. In other words, I made the division based on the probable phases of the respondent's working career. Finally, regarding the years of education, I hypothesized that the respondent had basic, high school, university or graduate level education (0–9, 10–13, 14–18, and 19–30 years of schooling respectively).

I built 58 models with three cumulative logit binary versions of the dependent variable in each (174 models in total). Running each one separately, is like interacting the subgroup in question with all the other control variables concurrently. As with the Models 1, 2a, 2b and 2c -where I utilized all the data-, these models generated coefficients for the period before the crisis ($b_1$Time), immediately after the crisis ($b_2$Diff) and the difference between the coefficients for the periods after and before the crisis ($b_3$GrowthD). Each of these coefficients can come out statistically insignificant (depicted as "0"), statistically significant with a negative sign (depicted as "-") and statistically significant with a positive sign (depicted as "+"). Thus, in each model there were potentially 27 (3*3*3) such combinations or "regimes" that could arise. After running the models, I identified 14 such regimes. In Table 4I list the regimes, the type of cumulative logit model and whether the effect of the financial crisis on the feeling of safety was positive, negative or none, both short term and long term. From left to right, the first of the signs refers to $b_1$Time, the second to $b_2$Diff and the third to $b_3$GrowthD. For example in regime "+-0" there were 10 models out of the 174 where the $b_1$Time was statistically significant and positive, the $b_2$Diff was statistically significant but negative, and the $b_3$GrowthD was statistically non-significant. This indicates that the impact of the financial crisis was negative and short-term. In the majority of these sub-group models (73%), the financial crisis of 2008 had no effect on the feeling of safety.

**Table 3** Interrupted time series ordinal logit model based on gologit2 using all the data

| Model 2 | 2a | 2b | 2c |
|---|---|---|---|
| **Cumulative Dependent variable**: | 1 (Very unsafe) vs. 2 (Unsafe) 3 (Safe) 4 (Very safe) | 1 (Very unsafe) 2 (Unsafe) vs. 3 (Safe) 4 (Very safe) | 1 (Very unsafe) 2 (Unsafe) 3 (Safe) vs. 4 (Very safe) |
| Weights: Yes | | | |
| Bootstrapping: Yes | | | |
| Stata command: gologit2 | | | |
| **Independent variables of interest** | | | |
| **Time**: Log odds before the crisis | 0.047 | 0.047 *** | 0.047 *** |
| **Short term impact of crisis** | | | |
| Year 2008 (Ref.) | 0.000 | 0.000 | 0.000 |
| **Diff**: Log odds difference of Year 2010 vs. 2008 | 0.130 | 0.011 | -0.063 * |
| **GrowthD** Difference of log odds after the crisis vs. before the crisis | 0.028 | 0.028 * | 0.028 * |
| **Control variables** | | | |
| **Country** | | | |
| 1 (BE – Ref.) | 0.000 | 0.000 | 0.000 |
| 2 (CH) | 0.236 * | 0.152 *** | 0.769 *** |
| 3 (FI) | 0.666 *** | 0.577 *** | 0.794 *** |
| 4 (GB) | -1.014 *** | -0.643 *** | 0.056 |
| 5 (HU) | 0.043 | -0.059 | -0.536 *** |
| 6 (IE) | -0.634 *** | -0.390 *** | 0.272 *** |
| 7 (NL) | 0.265 *** | 0.074 | -0.217 *** |
| 8 (NO) | 0.224 * | 0.427 *** | 1.149 *** |
| 9 (PT) | 0.830 *** | 0.437 *** | -0.088 * |
| 10 SI) | 2.057 *** | 1.355 *** | 0.817 *** |
| **Main Activity** | | | |
| 0 (Work – Ref.) | 0.000 | 0.000 | 0.000 |
| 1(Unemployed) | 0.013 | 0.013 | 0.013 |
| 2(Outside labor markets) | -0.114 | -0.114 *** | -0.114 *** |
| 3 (Other) | 0.043 | 0.043 | 0.043 |
| **Trust** | | | |
| Trust in people | 0.142 *** | 0.114 *** | 0.082 *** |
| Trust in legal system | 0.074 *** | 0.050 *** | 0.020 *** |
| Trust in police | 0.024 ** | 0.024 *** | 0.024 *** |
| Trust in politicians | 0.047 *** | 0.009 | -0.028 *** |
| **Gender** | | | |
| 1(Male – Ref.) | 0.000 | 0.000 | 0.000 |
| 2(Female) | -1.281 *** | -1.142 *** | -0.926 *** |
| **How religious are you** | -0.019 *** | -0.019 *** | -0.019 *** |
| **Age** | 0.066 *** | 0.052 *** | 0.038 *** |
| **Age*Age** | -0.001 *** | -0.001 *** | -0.000 *** |
| **How happy are you** | 0.030 ** | 0.037 *** | 0.083 *** |
| **How often socially do you meet with friends**, etc. | | | |
| 1 (Up to Once/month – Ref.) | 0.000 | 0.000 | 0.000 |
| 2 (Several time/week) | 0.022 | 0.022 | 0.022 |
| 3 (Up to every day) | -0.004 | 0.089 ** | 0.198 *** |

**Table 3** (continued)

| Model 2 | 2a | 2b | 2c |
|---|---|---|---|
| **Political ideology on left - right scale** | -0.014 ** | -0.014 *** | -0.014 *** |
| **Years of full-time education completed** | 0.047 *** | 0.025 *** | 0.012 *** |
| **Subjective general health** | | | |
| 1 (Very good – Ref.) | 0.000 | 0.000 | 0.000 |
| 2 (Good) | 0.042 | -0.236 *** | -0.637 *** |
| 3 (Fair) | -0.386 *** | -0.580 *** | -0.664 *** |
| 4 (Bad/Very bad) | -0.836 *** | -0.798 *** | -0.569 *** |
| **Feeling about household's income** | | | |
| 1 (Living comfortably – Ref.) | 0.000 | 0.000 | 0.000 |
| 2 (Coping with present income) | -0.098 | -0.091 ** | -0.175 *** |
| 3 (Difficult with present income) | -0.356 *** | -0.300 *** | -0.160 *** |
| 4 (Very Difficult with present income) | -0.686 *** | -0.462 *** | -0.053 |
| Constant | 1.111 *** | -0.145 | -2.612 *** |
| N | 139,741 | | |
| aic | 265,519 | | |
| bic | 266,553 | | |
| Pseudo R2 | 0.118 | | |

Note: Dependent variable is the feeling of safety: 1 (Very unsafe) 2 (Unsafe) 3 (Safe) 4 (Very safe)

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

Source: European Social Survey

I found positive effects in 25 models (14.4%) and in 22 (12.6%) negative effects. Note that only three (13.6%) of those latter models, the negative effect was long term. The rest indicated short-term negative effects. Also in the majority of cases (59.1%), the reduction of the feeling of safety was reported by those respondents that previously felt the most secure.

In Tables 5 and 6, I list the actual models in which negative effects were observed. In their specifications, I included the same independent variables as those shown in Model 2. I report only the coefficients of interest ($b_1$Time, $b_2$Diff and $b_3$GrowthD)[8]. To be consistent with each of the three logit models generated by gologit2, I applied the parallel lines assumption in all control variables and let the three coefficients of interest fluctuate freely. In other words, I run so-called "Partial Proportional Odds" models (Williams 2016, pp. 9–11). I also tested other combinations of models where no weights were included in the specification and/or where I let gologit2 generate automatically the best fit. The results came similar to the ones I report here.

Table 5 contains models based on data from each of the six countries in which the 2008 crisis generated negative effects. Switzerland (CH), Hungary (HU), Norway (NO) and Portugal (PT) had short-term negative effects (Models 3, 5, 7 and 8), whereas Britain (GB) and Ireland (IE) had long term negative effects (Models 4 and 6). Table 6 on the other hand, depicts the models based on individual characteristics of respondents in which negative effects were found. Here we observe only short-term negative effects and mostly, but not only, in those individuals with outlier preferences and personal characteristics. For example, negative effects on their feeling of safety were found in those people that trusted the legal system and the police the least (Models 10, 12), their happiness level was low (Model 13),

[8] The complete models with all the estimated parameters are available upon request.

**Table 4** Summary of cumulative logit models based on sub-groups of sample: the effect of 2008 financial crisis on the feeling of safety

| | **Negative effects** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Cum. dep. var | Cum. dep. var | Cum. dep. var | | | | |
| | **Regime** | 1 vs. 2,3,4 | 1,2 vs. 3,4 | 1,2,3 vs. 4 | Total | | | Effect |
| 1 | +-0 | 2 | 1 | 7 | 10 | 45.5% | 5.7% | Negative short term |
| 2 | +-+ | 0 | 1 | 3 | 4 | 18.2% | 2.3% | Negative short term |
| 3 | 0-+ | 0 | 2 | 2 | 4 | 18.2% | 2.3% | Negative short term |
| 4 | ++- | 2 | 1 | 0 | 3 | 13.6% | 1.7% | Negative long term |
| 5 | 0–0 | 0 | 0 | 1 | 1 | 4.5% | 0.6% | Negative short term |
| | Sub total | 4 | 5 | 13 | 22 | 100.0% | 12.6% | |
| | | 18.2% | 22.7% | 59.1% | 100.0% | | | |
| | **No effects** | | | | | | | |
| | | Cum. dep. var | Cum. dep. var | Cum. dep. var | | | | |
| | **Regime** | 1 vs. 2,3,4 | 1,2 vs. 3,4 | 1,2,3 vs. 4 | Total | | | Effect |
| 6 | +00 | 24 | 25 | 19 | 68 | 53.5% | 39.1% | No effect |
| 7 | 000 | 25 | 17 | 17 | 59 | 46.5% | 33.9% | No effect |
| | Sub total | 49 | 42 | 36 | 127 | 100.0% | 73.0% | |
| | | 38.6% | 33.1% | 28.3% | 100.0% | | | |
| | **Positive effects** | | | | | | | |
| | | Cum. dep. var | Cum. dep. var | Cum. dep. var | | | | |
| | **Regime** | 1 vs. 2,3,4 | 1,2 vs. 3,4 | 1,2,3 vs. 4 | Total | | | Effect |
| 8 | 00+ | 1 | 5 | 6 | 12 | 48.0% | 6.9% | Postive long term |
| 9 | 0+0 | 2 | 2 | 1 | 5 | 20.0% | 2.9% | Positive short term |
| 10 | 0++ | 0 | 2 | 1 | 3 | 12.0% | 1.7% | Positive short and long term |
| 11 | -+0 | 1 | 1 | 0 | 2 | 8.0% | 1.1% | Positive short term |
| 12 | ++0 | 0 | 1 | 0 | 1 | 4.0% | 0.6% | Positve short term |
| 13 | +0+ | 0 | 0 | 1 | 1 | 4.0% | 0.6% | Positive long term |
| 14 | -0+ | 1 | 0 | 0 | 1 | 4.0% | 0.6% | Positive long term |
| | Sub total | 5 | 11 | 9 | 25 | 100.0% | 14.4% | |
| | | 20.0% | 44.0% | 36.0% | 100.0% | | | |
| | Total | 58 | 58 | 58 | 174 | | | |

Note: Dependent variable is the feeling of safety: 1 (Very unsafe) 2 (Unsafe) 3 (Safe) 4 (Very safe)
Source: European Social Survey

they had very conservative political views (Model 14), had little education (Model 15) and reported having difficulties based on their current income (Model 17).

## 5 Concluding remarks

### 5.1 Summary

The empirical analysis indicates that during the 20-year period scrutinized the 2008 recession had no negative effects on the feeling of safety, overall. Short-term however, by 2010,

**Table 5** Models with negative effects of financial crisis on the feeling of safety per country

| Model | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|
| **Country** | CH | GB | HU | IE | NO | PT |
| Weights: Yes | | | | | | |
| Bootstraopping: Yes | | | | | | |
| Stata command: gologit2 | | | | | | |
| Control variables: Yes | | | | | | |
| **Model** | 3a | 4a | 5a | 6a | 7a | 8a |
| **Cumulative dependent variable**: 1 (Very unsafe) vs. 2 (Unsafe) 3 (Safe) 4 (Very safe) | | | | | | |
| **Time** | 0.116 | 0.117 ** | -0.177 * | 0.148 ** | 0.003 | 0.175 * |
| Year 2008 (Ref.) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| **Diff** | -0.405 | 0.400 ** | -0.312 | 0.557 ** | -0.088 | **-0.601** ** |
| **GrowthD** | 0.025 | **-0.136** ** | 0.475 *** | **-0.219** ** | 0.207 | 0.067 |
| **Model** | 3b | 4b | 5b | 6b | 7b | 8b |
| **Cumulative Dependent variable**: 1 (Very unsafe) 2 (Unsafe) vs. 3 (Safe) 4 (Very safe) | | | | | | |
| **Time** | 0.002 | 0.034 | -0.018 | 0.165 *** | 0.087 * | 0.008 |
| Year 2008 (Ref.) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| **Diff** | -0.099 | 0.472 *** | **-0.319** *** | 0.192 * | **-0.449** *** | **-0.245** * |
| **GrowthD** | 0.117 ** | -0.012 | 0.160 *** | **-0.190** *** | 0.098 * | 0.138 ** |
| **Model** | 3c | 4c | 5c | 6c | 7c | 8c |
| **Cumulative Dependent variable**: 1 (Very unsafe) 2 (Unsafe) 3 (Safe) vs. 4 (Very safe) | | | | | | |
| **Time** | 0.117 *** | 0.063 | 0.165 ** | 0.092 ** | 0.112 *** | -0.083 |
| Year 2008 (Ref.) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| **Diff** | **-0.211** ** | 0.267 ** | **-0.732** *** | -0.105 | **-0.249** ** | **-0.456** *** |
| **GrowthD** | -0.035 | -0.030 | -0.070 | -0.022 | 0.015 | 0.295 *** |
| N | 13,827 | 16,965 | 12,096 | 16,368 | 13,701 | 11,681 |
| aic | 26,369 | 37,196 | 22,954 | 34,946 | 23,514 | 21,876 |
| bic | 26,625 | 37,459 | 23,205 | 35,208 | 23,770 | 22,126 |
| Pseudo R2 | 0.087 | 0.092 | 0.051 | 0.068 | 0.121 | 0.062 |
| **Negative effects** | | | | | | |
| **Cumulative Dependent variable**: | 1 ,2, 3 vs. 4 | 1 vs. 2, 3, 4 | 1, 2 vs. 3, 4 | 1 vs. 2, 3 ,4 | 1, 2 vs. 3, 4 | 1 vs. 2, 3, 4 |
| Regime | +-0 | ++- | 0-+ | ++- | +-+ | +-0 |
| Effect | Short term | Long term | Short term | Long term | Short term | Short term |
| **Cumulative Dependent variable**: | | | 1, 2, 3 vs. 4 | 1, 2 vs. 3, 4 | 1, 2, 3 vs. 4 | 1, 2 vs. 3, 4 |
| Regime | | | +-0 | ++- | +-+ | 0-+ |

**Table 5** (continued)

| Model | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|
| Effect | | | Short term | Long term | Short term | Short term |
| **Cumulative Dependent variable**: | | | | | | 1, 2, 3 vs. 4 |
| Regime | | | | | | 0-+ |
| Effect | | | | | | Short term |

Note: Dependent variable is the feeling of safety: 1 (Very unsafe) 2 (Unsafe) 3 (Safe) 4 (Very safe)

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

Source: European Social Survey

the feeling of safety diminished specifically in those respondents that felt the most secure just before the crisis. One might conclude that both the General Strain and the Economics of Crime theories hold in the former case and do not in the latter, that is, depending on the chronological interval examined. This indicates that crime conditions prevailing at street level deteriorated just after the recession, but improved later. Note however that my intention is not to directly test these theories empirically. Rather, I utilize them as background and intermediating mechanisms in my attempt to identify subgroups of respondents whose feelings of safety were affected negatively by the economic recession of 2008.

The aforementioned mixed results were estimated using the whole sample. Once I divided the data into smaller subgroups, the models revealed additional negative effects, mostly short term. What were the characteristics of those groups? First, it seems that the 2008 economic crisis made those that were already economically weaker, even more insecure (Weinstein and Stone 2018). People who had less trust in the country's institutions probably felt less secure as well (Blanco 2011; Blanco and Ruis 2013; Palmisano and Sacchi 2024). Those who live in safer neighborhoods report being in general happier. The contrary is true for those who reside in crime- ridden areas (Cheng and Smyth 2015). In addition, being unhappy usually means being psychologically and physically more vulnerable (Headey and Yong 2019). Hence, the combination of being unhappy and living in conditions of economic downturn enhanced one's feelings of insecurity. Finally, those who are ideologically more conservative have a tendency to focus on the negative behavior of minorities, since this is where crime is mostly observed (Whittle and Parker 2014). If conservative respondents perceived that crime increased in the recent economic recession, they also reported feeling less secure. Note that these results are similar with some of the associations of the same variables included in Model 1. However, there are important differences in their interpretation. In Model 1, these variables were used as plain controls. Now however, they interact with the variables depicting time and the economic crisis and reveal the effect they have -in any- on the feeling of safety, separately. The consensus appears to be that negative effects were mostly felt in those parts of the respondents, which had outlier preferences and personal characteristics.

## 5.2 Caveats

There are several caveats in the analysis. One is due to several variables not used in the models as controls. I do not know whether their inclusion would have altered the results

**Table 6** Models with negative effects of financial crisis on the feeling of safety based on individual characteristics

| Model | 9 | 10 | 11 | 12 | |
|---|---|---|---|---|---|
| | Trust in people 5–7 | Trust in legal system 0–4 | Trust in legal system 8–10 | Trust in police 0–4 | |
| Weights: Yes | | | | | |
| Bootstraopping: Yes | | | | | |
| Stata command: gologit2 | | | | | |
| Control variables: Yes | | | | | |
| Model | 9a | 10a | 11a | 12a | |
| **Cumulative Dependent variable**: 1 (Very unsafe) vs. 2 (Unsafe) 3 (Safe) 4 (Very safe) | | | | | |
| **Time** | 0.052 | 0.148 *** | 0.041 | 0.089 * | |
| Year 2008 (Ref.) | 0.000 | 0.000 | 0.000 | 0.000 | |
| **Diff** | 0.074 | **-0.214 *** | 0.476 ** | -0.042 | |
| **GrowthD** | 0.053 | -0.021 | -0.043 | -0.004 | |
| **Model** | 9b | 10b | 11b | 12b | |
| **Cumulative Dependent variable**: 1 (Very unsafe) 2 (Unsafe) vs. 3 (Safe) 4 (Very safe) | | | | | |
| **Time** | 0.049 ** | 0.068 *** | 0.007 | 0.079 *** | |
| Year 2008 (Ref.) | 0.000 | 0.000 | 0.000 | 0.000 | |
| **Diff** | 0.040 | -0.051 | 0.151 | -0.045 | |
| **GrowthD** | 0.013 | 0.017 | 0.080 ** | -0.017 | |
| **Model** | 9c | 10c | 11c | 12c | |
| **Cumulative Dependent variable**: 1 (Very unsafe) 2 (Unsafe) 3 (Safe) vs. 4 (Very safe) | | | | | |
| **Time** | 0.052 *** | 0.042 * | 0.055 ** | 0.051 * | |
| Year 2008 (Ref.) | 0.000 | 0.000 | 0.000 | 0.000 | |
| **Diff** | **-0.079 *** | **-0.115 *** | **-0.107 *** | **-0.141 *** | |
| **GrowthD** | 0.020 | 0.045 * | 0.024 | 0.063 * | |
| N | 69,121 | 42,760 | 36,072 | 23,996 | |
| aic | 130,700 | 89,224 | 64,275 | 50,457 | |
| bic | 131,084 | 89,588 | 64,632 | 50,797 | |
| Pseudo R2 | 0.0906 | 0.0762 | 0.11 | 0.0825 | |
| **Negative effects** | | | | | |
| **Cumulative Dependent variable**: | 1, 2, 3 vs. 4 | 1 vs. 2, 3, 4 | 1 vs. 2, 3, 4 | 1, 2, 3 vs. 4 | |
| Regime | +-0 | +-0 | +-0 | +-+ | |
| Effect | Short term | Short term | Short term | Short term | |
| **Cumulative Dependent variable**: | | 1, 2, 3 vs. 4 | | | |
| Regime | | +-+ | | | |
| Effect | | Short term | | | |
| **Model** | 13 | 14 | 15 | 16 | 17 |
| Weights: Yes | | | | | |
| Bootstraopping: Yes | | | | | |
| Stata command: gologit2 | | | | | |
| Control variables: Yes | | | | | |
| **Model** | 13a | 14a | 15a | 16a | 17a |

**Table 6** (continued)

| Model | 9 | 10 | 11 | 12 | |
|---|---|---|---|---|---|
| **Cumulative Dependent variable**: 1 (Very unsafe) vs. 2 (Unsafe) 3 (Safe) 4 (Very safe) | Happines 0–4 | Political 8–10 | Education 0–9 | Health fair 3 | Difficulties with Income 3 |
| **Time** | 0.024 | 0.032 | 0.080 * | 0.073 * | 0.061 |
| Year 2008 (Ref.) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| **Diff** | -0.094 | 0.014 | -0.175 | 0.007 | -0.165 |
| **GrowthD** | 0.094 | 0.127 | 0.053 | 0.063 | 0.054 |
| **Model** | 13b | 14b | 15b | 16b | 17b |
| **Cumulative Dependent variable**: 1 (Very unsafe) 2 (Unsafe) vs. 3 (Safe) 4 (Very safe) | | | | | |
| **Time** | 0.004 | 0.038 | 0.054 * | **0.055** ** | 0.036 |
| Year 2008 (Ref.) | 0.000 | 0.000 | 0.000 | **0.000** | 0.000 |
| **Diff** | -0.004 | -0.091 | 0.003 | **-0.129** * | -0.138 |
| **GrowthD** | 0.063 | 0.075 * | 0.004 | **0.042** | 0.040 |
| **Model** | 13c | 14c | 15c | 16c | 17c |
| **Cumulative Dependent variable**: 1 (Very unsafe) 2 (Unsafe) 3 (Safe) vs. 4 (Very safe) | | | | | |
| **Time** | **0.037** | **0.064** * | **0.053** * | **0.056** * | **0.039** |
| Year 2008 (Ref.) | **0.000** | **0.000** | **0.000** | **0.000** | **0.000** |
| **Diff** | **-0.473** *** | **-0.170** * | **-0.193** ** | **-0.173** ** | **-0.232** ** |
| **GrowthD** | **0.120** * | **0.014** | **0.021** | **0.018** | **0.032** |
| N | 8364 | 19,541 | 30,303 | 33,484 | 19,000 |
| aic | 18,605 | 37,492 | 62,151 | 68,345 | 40,298 |
| bic | 18,901 | 37,823 | 62,500 | 68,682 | 40,613 |
| Pseudo R2 | 0.0737 | 0.111 | 0.0872 | 0.0823 | 0.0655 |
| **Negative effects** | | | | | |
| **Cumulative Dependent variable**: | 1, 2, 3 vs. 4 | 1, 2, 3 vs. 4 | 1, 2, 3 vs. 4 | 1, 2 vs. 3, 4 | 1, 2 vs. 3, 4 |
| Regime | 0-+ | +-0 | +-0 | +-0 | 0–0 |
| Effect | Short term | Short term | Short term | Short term | Short term |
| **Cumulative Dependent variable**: | | | | 1, 2, 3 vs. 4 | |
| Regime | | | | +-0 | |
| Effect | | | | Short term | |

Note: Dependent variable is the feeling of safety: 1 (Very unsafe) 2 (Unsafe) 3 (Safe) 4 (Very safe)

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

Source: European Social Survey

generated, but in a quasi-experimental ex-post study such as this, it is by definition hard to achieve 100% unbiased estimates. Another problem refers to whether the results of the study can be generalized to a larger population. Since I have analyzed a limited number of countries, this is perhaps not possible. In addition, in my data, there are no variables iden-

tifying the specific areas where the respondents reside nor are there any statistics on crimes committed locally. Moreover, even if such information did exit, the analysis is retrospective, that is, not current. It covers a period in which the first measurement of the individual feeling of safety was back in 2002 and the most recent in 2021. Hence, we cannot use these results to implement immediate reactive and geographically targeted policies.

### 5.3 Future research and policy implications

The methodological approach where I examine separately subgroups in the data might reveal still more diversions from the general picture described with the models using all the data. I could for example create subgroups of respondents based on not just one of their preferences and personal characteristics, but based on combinations of two or three. Models using those subgroups would then generate coefficients as if there were two or three way interactions between the combined characteristics and the other control variables. The down side would be the reduction in the number of observations per model. Another topic for future research is to examine what happened and why at country level. Recall that short-term negative effects were observed in Switzerland, Hungary, Norway and Portugal and long-term negative effects in Britain and Ireland. On the contrary, the 2008 economic crisis did not affect negatively the overall feeling of safety in Belgium, Finland, Netherlands and Slovenia. I cannot immediately identify the reasons behind such differences. The most obvious explanation has to do with the overall policies implemented at that period in each country to combat the financial crisis. This is something I plan to investigate in the future. For each of the 10 countries, I would obviously need to gather crime prevention policies applicable through the 20-year period under scrutiny and somehow codify them so I can include them as variables in respective regression models. Finally, another topic not examined in this paper is the part of the sample where the effect of the 2008 crisis was either non-existent or positive. As shown in Table 4, in the majority of the models the effect of the 2008 crisis was either statistically insignificant (73%) or positive (14.4%). A future research question could for example investigate the individual preferences and personal characteristics of respondents that make them immune to exogenous economic shocks.

Ettema and Smajic (2015, p102) found that perceived safety when walking in different locations "…makes people more active, probably because it increases people's autonomy and self-esteem". Bennetts et al. (2017) mentioned that safety is a main goal when attempting to regenerate urban projects. Eller and Frey (2019, p.56) emphasized that "Making people feel safe is (or at least should be) a basic goal of decision-makers in all parts of private, professional and public life". In that respect, information regarding personal safety is important since it affects directly the quality of life, the welfare and the well-being of all citizens. As discussed above because of the nature of the data at hand and the retrospective nature of the analysis, direct and reactive actions to improve the feeling of safety are not possible. Nonetheless, the results can assist national and local authorities to act proactively, that is to plan future policies for example on the subject of neighborhood safety (Petersen et al. 2024). The results provide valuable feedback of how citizens evaluated their own level of safety and at the same time can identify specific characteristics in groups of respondents where the economic crisis of 2008 had an adverse effect on their feeling of safety, both short and long term. More so, the characteristics and preferences of those that are immune

to economic downturns can help shape targeted policies that could perhaps alleviate the hardships involved.

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**Data availability** The European Social Survey data for the analysis was uploaded from https://ess.sikt.no/en/?tab=overview. The actual database used as well as the stata code written for the reported models in the paper, are available upon request.

## Declarations

**Competing interests** The author has no relevant financial or non-financial interests to disclose.



## References

Agnew, R.: A revised strain theory of delinquency. Soc. Forces. **64**(1), 151–167 (1985)
Agnew, R.: Foundation for a general strain theory of crime and delinquency. Criminology. **30**(1), 47–88 (1992)
Agnew, R.: Building on the foundation of general strain theory: Specifying the types of strain most likely to lead to crime and delinquency. J. Res. Crime. Delinquency. **38**(4), 319–361 (2001). https://doi.org/10.1177/0022427801038004001
Arvanites, T.M., Defina, R.H.: Business cycles and street crime. Criminology. **44**(1), 139–164 (2006)
Becker, G.S.: Crime and punishment: An economic approach. J. Polit. Econ. **76**(2), 169–217 (1968)
Bennetts, H., Soebarto, V., Oakley, S., Babie, P.: Feeling safe and comfortable in the urban environment. J. Urbanism: Int. Res. Placemaking Urban Sustain. **10**(4), 401–421 (2017)
Blanco, L.: The Impact of Insecurity on Democracy and Trust in Institutions in Mexico. Pepperdine University, School of Public Policy Working Papers. Paper 25 (2011). https://digitalcommons.pepperdine.edu/sppworkingpapers/25
Blanco, L., Ruiz, I.: The impact of crime and insecurity on trust in democracy and institutions. Am. Econ. Rev. **103**(3), 284–288 (2013)
Brant, R.: Assessing proportionality in the proportional odds model for ordinal logistic regression. Biometrics, 1171–1178 (1990)
Bushway, S., Cook, P.J., Phillips, M.: The net effect of the business cycle on crime and violence. Economics and youth violence: Crime, disadvantage and community, 23–52 (2013)
Cheng, Z., Smyth, R.: Crime victimization, neighborhood safety and happiness in China. Econ. Model. **51**, 424–435 (2015)
Choi, Y.J., Matz-Costa, C.: Perceived neighborhood safety, social cohesion, and psychological health of older adults. Gerontologist. **58**(1), 196–206 (2018)
Cloward, R.A., Lloyd, E., Ohlin: Delinquency and Opportunity (1960)
Cohen, A.K.: Delinquent Boys. Free, New York (1955)
Duckitt, J., Wagner, C., Du Plessis, I., Birum: IThe psychological bases of ideology and prejudice: Testing a dual process model. J. Personal. Soc. Psychol. **83**(1), 75 (2002)
Efron, B., Tibshirani, R.: JAn Introduction To the Bootstrap. Chapman and Hall/CRC (1994)

Eller, E., Frey: DPsychological perspectives on perceived safety: Social factors of feeling safe. Perceived safety: A multidisciplinary perspective, 43–60 (2019)
Ettema, D., Smajic, I. Walking, places and wellbeing. Geogr. J. **181** 102–109 (2015). https://doi.org/10.1111/geoj.12065
Ewusie, J.E., Soobiah, C., Blondal, E., Beyene, J., Thabane, L., Hamid, J.S.: Methods, applications and challenges in the analysis of interrupted time series data: A scoping review. J. Multidisciplinary Healthc., 411–423 (2020)
Finklea, K.M.: Economic Downturns and Crime. Congressional Research Service, Library of Congress, December (2011)
Forde, D.R.: Perceived crime, fear of crime, and walking alone at night. Psychol. Rep. **73**(2), 403–407 (1993)
Frank, C., Davis, C.G., Elgar, F.J.: Financial strain, social capital, and perceived health during economic recession: A longitudinal survey in rural Canada. Anxiety Stress Coping. **27**(4), 422–438 (2014)
Freeman, R.B.: Why do so many young American men commit crimes and what might we do about it? J. Economic Perspect. **10**(1), 25–42 (1996)
French, D.: Financial strain in the united Kingdom. Oxf. Econ. Pap. **70**(1), 163–182 (2018)
Gopalan, M., Rosinger, K., Ahn, J.B.: Use of quasi-experimental research designs in education research: Growth, promise, and challenges. Rev. Res. Educ. **44**(1), 218–243 (2020)
Granath, J. Economic crises and crime: the effects of the great recession on swedish crime rates. Master Thesis. Uppsala University, Department of Economics (2021)
Hacker, J.S., Huber, G.A., Nichols, A., Rehm, P., Schlesinger, M., Valletta, R., Craig: SThe economic security index: A new measure for research and policy analysis. Rev. Income Wealth. **60**, S5–S32 (2014)
Halbesleben, J.R., Neveu, J.P., Paustian-Underdahl, S.C., Westman, M.: Getting to the COR Understanding the role of resources in conservation of resources theory. J. Manag. **40**(5), 1334–1364 (2014)
Hart, E.A.C., Lakerveld, J., McKee, M., Oppert, J.M., Rutter, H., Charreire, H., Mackenbach, J.D.: Contextual correlates of happiness in European adults. PloS One, **13**(1), e0190387 (2018)
Headey, B., Yong, J.: Happiness and longevity: Unhappy people die young, otherwise happiness probably makes no difference. Soc. Indic. Res. **142**, 713–732 (2019)
Ho, T., McKean, J.: Confidence in the Police and perceptions of risk. W Criminol. Rev. **5**, 108 (2004)
Hobfoll, S.E.: Conservation of resources: A new attempt at conceptualizing stress. Am. Psychol. **44**(3), 513 (1989)
Holmberg, L.: Policing and the feeling of safety: The rise (and fall?) of community policing in the nordic countries. J. Scandinavian Stud. Criminol. Crime. Prev. **5**(2), 205–219 (2005)
Jackson, J., Stafford, M.: Public health and fear of crime: A prospective cohort study. Br. J. Criminol. **49**(6), 832–847 (2009)
Jang, S.J., Agnew, R.: Strain Theories and Crime. In: James D. Wright (editor-in-chief), International Encyclopedia of the Social & Behavioral Sciences, 2nd edition, Vol 23. Oxford: Elsevier. pp. 495–500. ISBN: 9780080970868 (2015)
Kaminska, O.: Guide to using weights and sample design indicators with ESS data. Eur. Social Surv. (2020). https://www.europeansocialsurvey.org/sites/default/files/2023-06/ESS_weighting_data_1_1.pdf)
Kubíčková, L., Rašticová, M., Hazuchová, N.: What are Czech seniors afraid of? Study on feeling of safety among seniors. Sage Open. **12**(3), 21582440221116106 (2022)
Kurtz, J.: Crisis and Crime: Examining the Effect of Macroeconomic Conditions on Criminal Activity During the Great Recession, Masters Thesis, New York University (2015)
Latzer, B.: The Roots of Violent Crime in America: from the Gilded Age Through the Great Depression. LSU (2021)
Levitt, S.D.: Understanding why crime fell in the 1990s: Four factors that explain the decline and six that do not. J. Economic Perspect. **18**(1), 163–190 (2004)
Long, J.S., Freese, J.: Regression models for categorical dependent variables using Stata, 3rd Edition. College Station, TX: Stata Press (2014)
Malby, S., Davis, P., Wever, W., Broek, E., Rizzi, R., Pysden, C.: Monitoring the Impact of Economic Crisis on Crime. United Nations Office on Drugs and Crime (2012)
Mason, P., Kearns, A., Livingston, M.: Safe going: The influence of crime rates and perceived crime and safety on walking in deprived neighbourhoods. Soc. Sci. Med. **91**, 15–24 (2013)
Merton, R.K.: Social structure and anomie. Am. Sociol. Rev. **3**(5), 672–682 (1938)
Mouratidis, K.: The Impact of Urban Tree Cover on Perceived Safety, vol. 44, p. 126434. Urban Forestry & Urban Greening (2019)
Napier, J.L., Huang, J., Vonasch, A.J., Bargh, J.A.: Superheroes for change: Physical safety promotes socially (but not economically) progressive attitudes among Conservatives. Eur. J. Social Psychol. **48**(2), 187–195 (2018)
Palmisano, F., Sacchi, A.: Trust in public institutions, inequality, and digital interaction: Empirical evidence from European union countries. J. Macroecon. **79**, 103582 (2024)

Penfold, R.B., Zhang, F.: Use of interrupted time series analysis in evaluating health care quality improvements. Acad. Pediatr. **13**(6), S38–S44 (2013)
Petersen, K., Weisburd, D., Hinkle, J.C., Telep, C.W., Fay, S.: Does level of geography influence proactive policing's impact on crime? A synthesis of systematic reviews of three evidence-based policing strategies. Aggress. Violent. Beh., **101988** (2024)
Piroozfar, P., Farr, E.R., Aboagye-Nimo, E., Osei-Berchie, J.: Crime prevention in urban spaces through environmental design: A critical UK perspective. Cities. **95**, 102411 (2019)
Piza, E.L., Chillar, V.F.: The effect of Police layoffs on crime: A natural experiment involving new jersey's two largest cities. Justice Evaluation J. **4**(2), 176–196 (2021)
Putrik, P., Van Amelsvoort, L., Mujakovic, S., Kunst, A.E., van Oers, H., Kant, I., De Vries: N. K. Assessing the role of criminality in neighbourhood safety feelings and self-reported health: Results from a cross-sectional study in a Dutch municipality. BMC Public. Health. **19**, 1–12 (2019)
Ranci, C., Beckfield, J., Bernardi, L., Parma, A.: New measures of economic insecurity reveal its expansion into EU middle classes and welfare States. Soc. Indic. Res. **158**(2), 539–562 (2021)
Rohde, N., Tang, K.K.: Economic insecurity: Theoretical approaches. In: Handbook of Research on Economic and Social well-being, pp. 300–315. Edward Elgar Publishing (2018)
Rosenfeld, R.: Crime and the great recession: Introduction to the special issue. J. Contemp. Crim. Justice. **30**(1), 4–6 (2014)
Rosenfeld, R., Levin, A.: Acquisitive crime and inflation in the united states: 1960–2012. J. Quant. Criminol. **32**, 427–447 (2016)
Rubin, P.H.: Economics of crime. Atlanta Economic Rev. **28**(4), 38–43 (1978)
Rustenbach, E.: Sources of negative attitudes toward immigrants in europe: A Multi-Level analysis 1. Int. Migrat. Rev. **44**(1), 53–77 (2010)
Stafford, M., Chandola, T., Marmot, M.: Association between fear of crime and mental health and physical functioning. Am. J. Public Health. **97**(11), 2076–2081 (2007)
Temelová, J., Novák, J., Jíchová, J.: Safe life in the suburbs? Crime and perceptions of safety in new residential developments in prague's hinterland, Czech Republic1. Eur. Urban Reg. Stud. **23**(4), 677–696 (2016)
Thyer, B.A.: Quasi-experimental Research Designs. Oxford University Press (2012)
Torres-Tellez, J., Montero Soler, A.: After the economic crisis of 2008: Economic conditions and crime in the last decade for the case of Spain. Am. J. Econ. Sociol. **82**(3), 223–239 (2023)
Tsouvelas, G., Konstantakopoulos, G., Vakirtzis, A., Giotakos, O., Papaslanis, T., Kontaxakis, V.: Criminality in Greece during the years of financial crisis: 2008–2014. Psychiatrike = Psychiatriki. **29**(1), 19–24 (2018)
Turner, S.L., Karahalios, A., Forbes, A.B., Taljaard, M., Grimshaw, J.M., McKenzie, J.E.: Comparison of six statistical methods for interrupted time series studies: Empirical evaluation of 190 published series. BMC Med. Res. Methodol. **21**(1), 134 (2021)
Van Prooijen, J.W., Spadaro, G., Wang, H.: Suspicion of institutions: How distrust and conspiracy theories deteriorate social relationships. Curr. Opin. Psychol. **43**, 65–69 (2022)
van Zanden, J.L., Rijpma, A., Malinowski, M.: Mira d'Ercole, M. How's Life? 2020: Measuring Well-being. How's Life? OECD (2020). https://doi.org/10.1787/9870c393-en
Velasquez, A.J., Douglas, J.A., Guo, F., Robinette, J.W.: What predicts how safe people feel in their neighborhoods and does it depend on functional status? SSM-Population Health. **16**, 100927 (2021)
Venetoklis, T.: Exogenous shocks and citizens' with satisfaction with governmental policies: Can empirical evidence from the 2008 financial crisis help Us understands better the effects of the COVID-19 pandemic? Qual. Quant. **55**(6), 1973–2000 (2021)
Weinstein, N., Stone, D.N.: Need depriving effects of financial insecurity: Implications for well-being and financial behaviors. J. Exp. Psychol. Gen. **147**(10), 1503 (2018)
Whittle, T.N., Parker, K.F.: Public ideology, minority threat, and felony collateral sanctions: A state-level analysis. Criminal Justice Rev. **39**(4), 432–454 (2014)
Williams, R.: Generalized ordered logit/partial proportional odds models for ordinal dependent variables. Stata J. **6**(1), 58–82 (2006)
Williams, R.: Understanding and interpreting generalized ordered logit models. J. Math. Sociol. **40**(1), 7–20 (2016)
Wu, W., Guo, J., Ma, Z., Zhao, K.: Data-driven approach to assess street safety: Large-scale analysis of the microscopic design. ISPRS Int. J. Geo-Information. **11**(11), 537 (2022)