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ORIGINAL RESEARCH

The Shadow of the Financial Crisis: Socio-Economic and Welfare Policy Development and Fear of Crime in Europe. A Random Effects Within-Between Model Analysis of the European Social Survey, 2002–2018

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Abstract
Previous cross-sectional research has found large cross-country differences in crime-related feelings of insecurity associated not with crime rates but with welfare state policies reflecting that fear of crime serves as an expression of generalized social insecurities. The financial crisis plunged European societies into a period of severe socio-economic insecurities. Against this backdrop, I use hybrid multilevel models to test hypotheses if changes in socio-economic conditions and social policies – in particular following the 2008 financial crisis – have affected feelings of insecurity in 27 European countries, using nine rounds of the European Social Survey. Most indicators except the homicide rate did not show significant effects on fear of crime in the longitudinal dimension. The consequences of the financial crisis for people's well-being did not extend to fear of crime. Social expenditures in-kind for families and children showed the strongest association with fear of crime cross-sectionally but may lack the necessary country-level variation over time to produce significant effects. Mirroring research on generalized trust, fear of crime seems relatively stable over time and deeply associated with welfare state institutions.

Keywords Fear of crime · Financial crisis · Multilevel models · Europe · Welfare state · Cross-national comparison

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1 Introduction

Fear of crime[1] has a long research tradition. Since the 1960s, scholars have worked on this topic, with no sign of it abating. Fear of crime can diminish individual well-being and societal cohesion, and permeate political culture (Hale, 1996; Krulichová, 2021; Wenzelburger, 2020). It is therefore essential to gain a better understanding of factors influencing fear of crime and the mechanisms that underly this process. There has been an extensive literature on what causes fear of crime ranging from individual characteristics and experiences to local community conditions and macro-level societal influences (Boers, 2003; Lee & Mythen, 2017). One of these different research streams, the so-called generalized insecurities thesis, focuses on the fundamental insight that fear of crime is not solely about crime and the risk of victimization, but can be seen as an outlet for expressing other and more general fears and worries (e.g. Farrall et al., 2009; Hummelsheim et al., 2011; Jackson, 2004).This approach has been fruitfully applied to the analysis of considerable country-level differences in crime-related feelings of insecurity across Europe. A number of comparative studies found effects of social welfare spending and economic performance on fear of crime, based on cross-sectional designs (Hummelsheim et al., 2011; Vauclair & Bratanova, 2017; Vieno et al., 2013; Visser et al., 2013). However, as any other study aiming at cause-and-effect statements, macro- and multilevel analyses are sensitive to issues of endogeneity and omitted variable bias (Gangl, 2010; Kim & Swoboda, 2011). In addition, while country-level social structures and policies may be less changeable than individual-level phenomena they are certainly not static (Tormos et al., 2017) and we still know little about the effects of such macro-level changes on social attitudes and cognitions. The 2008 financial crisis was one of a few major events in recent decades with global consequences, leading to a sudden economic slump and triggering wide-ranging changes in (social) policy strategies. Studies have started to investigate the consequences of the financial crisis on people's social perceptions and attitudes (e.g. Giugni & Grasso, 2018).

The current study contributes to this research stream and intends to fill a gap in the fear of crime literature by extending Hummelsheim et al.'s (2011) seminal analysis of country differences in fear into a longitudinal analysis of dynamic macro-level changes in relation to changes in fear of crime, thus putting hypotheses on societal-level influences on fear of crime to a stronger test. This is achieved by using hybrid multilevel models which include variations between countries (between-level effects) and changes over time (within effects) simultaneously (Fairbrother, 2014; Schmidt-Catran & Fairbrother, 2016). The dataset includes nine waves of the European Social Survey (ESS) for 27 countries combined with country-level indicators of social and economic conditions, welfare expenditures, and crime rates. Over the period 2002–2018, the average fear of crime declined steadily but increased slightly around 2008. The model results confirm the negative between effect of non-monetary welfare expenditures on fear of crime, and changes in homicide rates also show a strong, positive, and robust effect on fear of crime. The economic predictors show no robust effects on fear of crime.

[1] I will use the terms fear of crime and crime-related feelings of insecurity simultaneously. See Farrall et al., 2009 for a discussion of terms.

2 Fear of Crime as an Expression of Broader Social Insecurities

In this paper, I explore how socio-economic and social policy indicators and especially their development over time affect fear of crime, adding to an extensive body of research which is based on the generalized insecurities thesis. Early in the history of fear of crime research the question arose whether fear of crime was solely a consequence of victimization experiences and risks. Garofalo and Laub (1978, p. 243) brought these doubts to a head by asking: "Is fear of crime simply the fear of crime?", thereby opening up a field of research that sees fear of crime in a broader context of perceptions of social insecurities, the degradation of social trust, and unease about social change. In this view, crime-related insecurities are an expression of wider concerns about the personal social and economic situation as well as that of local communities and society at large (Dowds & Ahrendt, 1995; Jackson, 2004). Fear of crime absorbs these diffuse and abstract social fears and anxieties like a sponge and helps to articulate them (Hirtenlehner, 2009; Jackson, 2006). According to Farrall et al., (2009, p. 231), fear of crime reflects "beliefs and attitudes which are more deeply seated and broadly orientated towards social and cultural changes in wider society". In its symbolic function as a proxy for broader insecurities and diffuse anxieties, fear of crime is interwoven with existential fears and concerns about an uncertain future (Hummelsheim et al., 2011; Jackson, 2004). This line of argument resembles current research on the sources of (low) generalized trust (cf. Hummelsheim et al., 2011 for a direct comparison; Kumlin et al., 2017; Nguyen, 2017). The metaphorical interpretation does not invalidate research that did find direct effects of victimization experiences or crime rates on fear of crime (Ejrnæs & Scherg, 2020; Janssen et al., 2021) but expands the spectrum of influences on insecurity perceptions. The current study ties in with this interpretation and regards fear of crime as a projection screen for social insecurities.

3 The Financial Crisis, Economic Downturns, and Fear of Crime

The 2008 financial crisis impacted societies worldwide like few other events in recent decades—except the COVID-19 pandemic. The crisis disrupted a long phase of economic growth and brought economic insecurity and rising unemployment rates, with considerable differences in the magnitude between less-affected countries like Germany and severely-hit countries for example in Southern Europe (Aliber & Zoega, 2019; Anderton et al., 2015; Bartels & Morelli, 2021). Unlike during the Great Depression of 1929, most developed countries were able to cushion the economic and social impact of this crisis, yet policies differed by country and welfare regimes (Ólafsson et al., 2019). Stimulus packages helped to stabilize the financial sector and the economy, while costly social programs such as furlough schemes buffered social consequences (Wagschal & Jäkl, 2010). This led to a sharp increase in new debt in most countries and subsequent debt-induced austerity measures (Ólafsson et al., 2019).

Many studies showed that the financial crisis had numerous adverse consequences on people's wellbeing, perceptions and attitudes. While the effects on interpersonal trust were less marked (Glatz & Eder, 2020; Iglič et al., 2021), it dented political trust and satisfaction with democracy (Gangl & Giustozzi, 2018; Kroknes et al., 2015; Lindström & Giordano, 2016; Lo Iacono & Quaranta, 2019; Quaranta & Martini, 2016; van Erkel & van der Meer, 2016) and increased support for right-wing populism (Funke et al., 2016) and xenophobia

(Andreotti & Mingione, 2016; Becker et al., 2011; Billiet et al., 2014). In the hardest-hit countries, the financial crisis increased mental health problems and suicide rates (Chang et al., 2013; Kubrin et al., 2022; Reibling et al., 2017; Stuckler et al., 2009). This paper extends recent research on the consequences of the financial crisis to the issue of crime-related insecurities.

As early as 1998, Taylor and Jamieson (1998) argued that feelings of insecurity rose in the mid-1990s in the United Kingdom as it transformed from a world-leading economic power to an importer of goods and services. A country's economic performance is commonly measured by its GDP. Looking at GDP over the last 20 years, the financial crisis temporarily dented a long-term growth trend (see Fig. 1). This economic downturn was more pronounced in the Anglo-Saxon and southern European countries compared to other European countries.

In economic crises, governments and companies try to reduce spending due to a tighter budget which leads to a general decrease of the economy (Anderton et al., 2015; Kroknes et al., 2015). It is likely that the 2008 financial crisis triggered or exacerbated socioeconomic insecurity especially for people in the weaker economies. Concerns about the economic situation make people feel more vulnerable to existential threats which are beyond their control, and such anxieties can be projected onto crime (Vieno et al., 2013). I assume that:

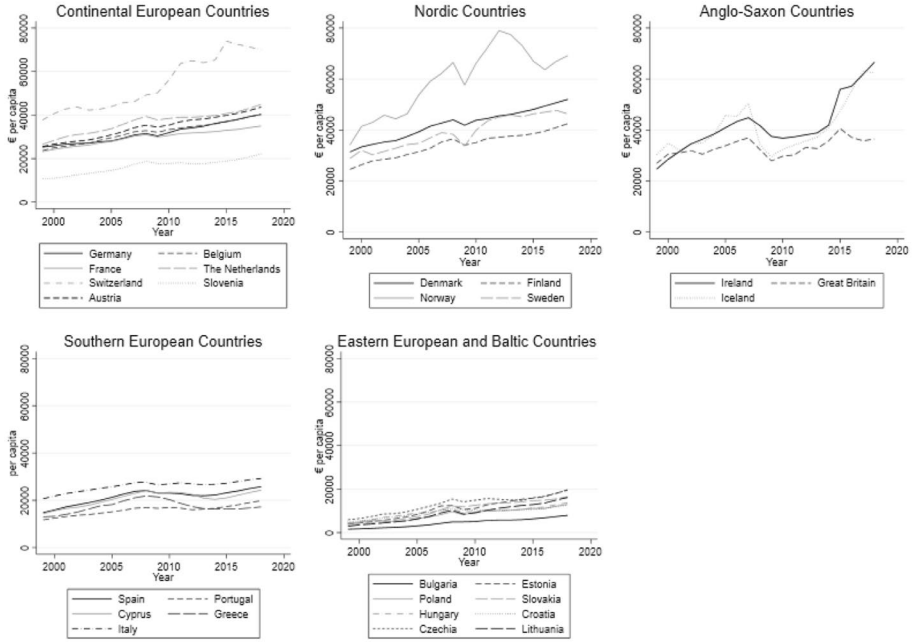

Fig. 1 GDP (€ per capita) [1999–2018], by welfare regimes, Source: Eurostat (own calculations). See Jonsson (2001) for including Iceland into the Anglo-Saxon/Beveridge System welfare regime

H1a A change in GDP is negatively associated with a change in fear of crime (time-varying/within effect).

H1b A lower level of GDP is associated with higher fear of crime (time-invariant/between effect).

In addition to GDP, the unemployment rate is an important indicator of economic conditions. The unemployment rate rose very sharply after the financial crisis in most countries, especially in the Anglo-Saxon, southern and eastern European countries and remained very high for many years in some of these countries. A higher unemployment rate may lead to increasing uncertainty, as it significantly increases a possible threat of economic uncertainty especially for lower-educated people. Previous studies using the unemployment rate showed mixed results: Hummelsheim et al. (2011) found a reinforcing effect while Visser et al. (2013) in a model using multi country-level predictors did not. I assume that:

H2a A change in the unemployment rate is positively associated with a change in fear of crime (time-varying/within effect).

H2b A higher unemployment rate is associated with higher fear of crime (time-invariant/between effect).

The effects of the financial crisis were borne disproportionately by the poor. Rising unemployment rates, a rise in atypical employment, and wage as well as welfare cuts contribute to an aggravation of poverty and social inequality (Atkinson & Morelli, 2011; Matsaganis, 2011; OECD, 2016). However, the Gini coefficient of income inequality did not uniformly increase in Europe after the crisis, instead we see different levels and divergent trends during the 20-year period, with some countries experiencing strong increases already before the financial crisis (see Online Supplementary Information, Fig. A2).

High levels of social inequality have been attributed to various social ills such as lower life satisfaction and health (Graafland & Lous, 2019; Schröder, 2018; Wilkinson & Pickett, 2009), lower trust (Goubin & Hooghe, 2020; Lo Iacono & Quaranta, 2019), as well as higher crime rates (Jacobs & Richardson, 2008; Jennings et al., 2012). A number of studies have found evidence for a connection between social inequality and insecurity perceptions (Acampora et al., 2020; Clément & Piaser, 2021; but see Hummelsheim et al., 2011; Rueda & Stegmueller, 2016; Vauclair & Bratanova, 2017; Vieno et al., 2013), and some of these studies argue that lower levels of trust mediate this link (Collins & Guidry, 2018; Kujala et al., 2019). The link between social inequality, trust, and feelings of insecurity could be explained by the detrimental effects of increased status competition in more unequal societies (Delhey & Steckermeier, 2020; Layte & Whelan, 2014; Wilkinson & Pickett, 2009). I assume that:

H3a A change in income inequality is positively associated with a change in fear of crime (time-varying/within effect).

H3b A higher level of income inequality is associated with higher the fear of crime (time-invariant/between effect).

4 Feelings of Insecurity and the Welfare State

Hummelsheim et al. (2011) cross-national study of fear of crime put a spotlight on the role of welfare state policies in buffering generalized insecurities. Their analysis showed that country-level differences in fear of crime could be best accounted for by levels of public spending for certain social protection instruments, rather than by crime, poverty, or income inequality (cf. Vieno et al., 2013; Visser et al., 2013). Hummelsheim et al., (2011, p. 337) argued that social protection provided by the welfare state successfully mitigates "various social and economic fears which would otherwise be projected onto crime", mirroring very similar arguments made by other scholars with regard to the importance of welfare states for fostering political and social trust (Kumlin et al., 2017) and general well-being (Boarini et al., 2013; O'Connor, 2017). More specifically, Hummelsheim et al. (2011) maintained that welfare instruments that have an activating effect on individuals and help them to master their own lives, for example by supporting skill formation and labor market access, are more effective in preventing generalized insecurities than cash benefits that alleviate income poverty but treat citizens as passive recipients. Supporting this claim, they found that in-kind benefits for families and children and expenditures for education both accounted for almost two-thirds of the country-level variance in fear of crime while cash benefits for family and children and expenditures for pensions and accounted for less than five percent of country-level variance (Hummelsheim et al., 2011, p. 336). This line of argument has since been supported by research on the effects of national labor market policies on generalized trust: Both Lee (2013) and Nguyen (2017) found that active policies that support labor market access are more successful than passive social transfers in fostering trust or in cushioning the negative effects of unemployment on trust. Ejrnæs and Scherg (2020) demonstrated that the increase in fear of crime associated with personal victimization is much smaller in the Nordic welfare states compared with all other welfare regimes, echoing Cullen (1994, p. 550) claim that "social support lessens the pain of victimization".

In addition to the buffering effect of welfare policies on generalized insecurities, there may also exist an indirect effect via lower crime rates, as cross-national studies have shown that welfare policies reduce homicide rates (McCall & Brauer, 2014; Rudolph & Starke, 2020, see below).

The levels of welfare spending vary considerably between European countries. Looking at social expenditures in-kind for families and children (as opposed to cash benefits) the Nordic countries show the highest levels whereas the Southern and Eastern European states show the lowest levels (see Fig. 2).

While austerity policies in the aftermath of the financial crisis have drawn a lot of attention by political and social scientists (Greve, 2020; Nelson et al., 2022), little is yet known about the effects of changes in welfare spending on people's wellbeing and social cognitions (Kumlin et al., 2017). As the focal interest of this paper is to test whether the strong association between in-kind expenditures for families and children and fear of crime found in Hummelsheim et al.'s (2011) cross-sectional analysis can be confirmed in a longitudinal perspective, I concentrate on this specific indicator of welfare expenditures. Nygård et al. (2019) reported an "overall and stable upward trend" of in-kind benefit spending in Europe between 2006 and 2015 including during the financial crisis (in contrast to cash benefits), with only few variations between individual countries. I assume that:

H4a A change in in-kind social expenditures on families and children is negatively associated with a change in fear of crime (time-varying/within effect).

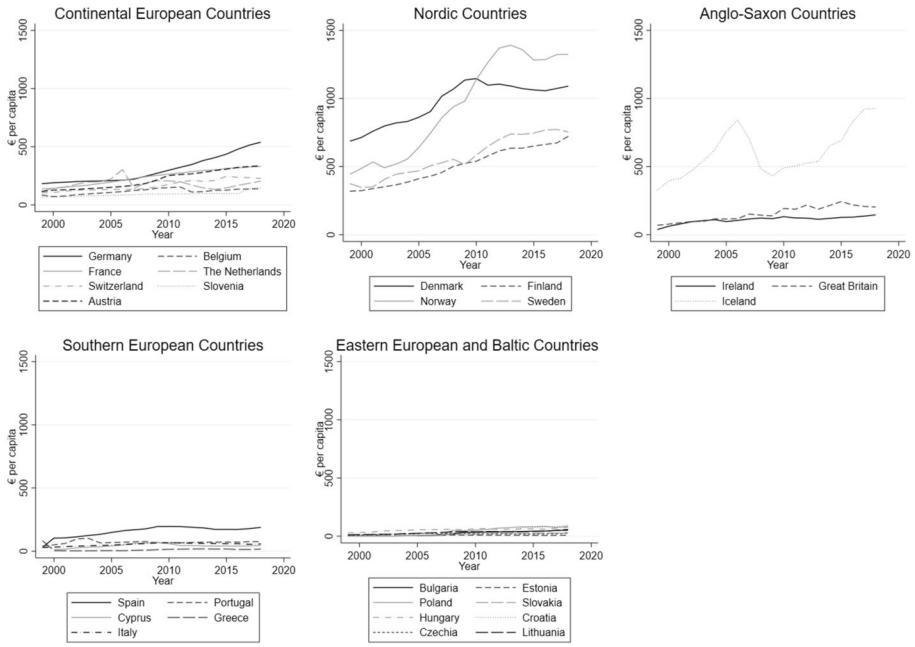

Fig. 2 Social expenditures on families/children in-kind (per capita) 1999–2018 by welfare regimes, Source: Eurostat (own calculations)

H4b A higher level of in-kind social expenditures on families and children is associated with lower fear of crime (time-invariant/between effect).

5 Crime rates and Fear of Crime

A recurring question in fear of crime research is how strong or weak the relationship between actual crime and fear of crime is, or whether there is one at all (Hale, 1996; Rountree, 1998). While an effect of individual victimization on fear of crime has been demonstrated (e.g. Collins, 2016; Janssen et al., 2021), the results are less clear when looking at the association between crime rates and fear of crime at different aggregation levels. Some recent longitudinal analyses have found effects of regional or national crime rates on crime perceptions in the United Kingdom and Germany (Acampora et al., 2020; Enns et al., 2022; Karstedt & Endtricht, 2022; Krekel & Poprawe, 2014) while a US study did not (Shi et al., 2020). Previous cross-sectional research using European survey data was inconclusive as it found weak or no association between overall crime rates and feelings of insecurity (Hummelsheim et al., 2011; Vauclair & Bratanova, 2017; Vieno et al., 2013; Visser et al., 2013). Additionally, Karstedt and Endtricht (2022) found a stronger responsiveness of public crime perceptions to changes in homicide rates as compared to less severe crime types. High crime rates can be interpreted as an indication that social norms are being broken and that social order is being disrupted as a result, which could lead to an increase in general insecurity. In

addition, people may estimate their own probability of being victimized to be higher, which could also increase fear of crime. I use homicide as crime indicator and assume:

H5a A change in the homicide rate is positively associated with a change fear of crime (within effect).

H5b A higher level of the homicide rate is associated with higher fear of crime (between effect).

6 Data

For this analysis I use nine waves of the European Social Survey (ESS) and country-level data from Eurostat[2] between 2002 and 2018, the last wave to be conducted face-to-face. The European Social Survey provides a high data quality and is well suited to analyze longer-term trends in social attitudes and perceptions across societies (Neller, 2004; Schmidt-Catran & Fairbrother, 2016). After excluding countries for which either no country data were available or which have fewer than three waves in the ESS, the dataset comprises 27 countries.[3]

6.1 Fear of Crime

Fear of crime is measured by the single question "How safe do you feel—or would you feel—when you are or would be walking alone in your neighborhood after dark?". The variable has four expressions: very safe, safe, unsafe, and very unsafe, and is thus ordinally scaled, but treated here as continuous (see Sect. 7.1 for a more extensive discussion). This variable is considered the 'standard indicator' of fear of crime and is employed in many surveys internationally, even though it has often been criticized for its imprecision and lack of conceptual clarity, mostly for not "clearly relating to crime" (Farrall et al., 2021, p. 349) as the word 'crime' is not mentioned in the survey question (see for a more detailed discussion: Ferraro & Grange, 1987; Hart et al., 2022). However, following the generalized insecurities thesis, fear of crime relates less to "the specific details of time and place, and [is] more akin to a set of attitudes or opinions which are brought forth when people are asked to discuss their feelings about crime" (Farrall et al., 2009, p. 153). It is precisely because of this vagueness that the standard indicator is very suitable for my research question, since it has often been argued that the responses elicited by this question capture broader social insecurities projected onto crime (Farrall et al., 2021; Hummelsheim et al., 2014). There is only one single item for fear of crime in the ESS which reduces the reliability of the measurement.

[2] In some cases Eurostat data were not available, and UNODC data was used instead if the definition and data collection method were comparable.

[3] These are Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Lithuania, the Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

6.2 Explanatory Variables[4]

The foremost indicator of the economic impact of the financial crisis is the national *GDP*, measured in euros per capita. Additionally, I use the *unemployment rate*, which is given in relation to the active labor force (percent of active population), and the *Gini coefficient* of income inequality (0–100), where 100 means absolute inequality.

Social expenditures in-kind on families and children (short: in-kind expenditures) are expressed by expenditures in euros per capita. Social expenditures in-kind for families and children "are benefits granted in the form of goods and services" (Eurostat, 2019, p. 39), such as child day care, accommodation, home help and other benefits in-kind. Conventionally, social expenditures are often used as a percentages of GDP which assures comparability between countries (Hummelsheim et al., 2011; Visser et al., 2013). During the economic downturn in 2010, however, expenditures per GDP would artificially indicate a considerable increase just because GDP decreased (Greve, 2020; Nygård et al., 2019). In this situation, expenditures in fixed euro-prices per capita are the better option which allows comparability between countries while addressing the different population sizes of a country as well as its demographic change. The *homicide rate* measures intentional homicides per 100,000 population. All country variables are standardized for the analysis and divided into their time-invariant and -variant components (see next section).

On the individual level, I draw on socio-demographic variables that have been shown in many studies to be stable correlates of crime-related feelings of insecurity: educational and employment status, household income, gender, age, size of the place of residence, and previous victimization. Education (full-time) and age are measured in years and are included as non-linear (simple and quadratic) predictors. Household income is measured in country specific deciles.[5] All metric individual variables are centered around the grand-mean. Missing values were either deleted listwise in the case of age and education (metric variables) or included via a dummy in all other cases (categorial variables). Including 0.95% missing responses to the dependent variable fear of crime,[6] overall 2.2% of respondents are excluded by listwise deletion.

7 Multilevel Modelling of Cross-National Longitudinal Survey Data

In recent years, the availability of cross-national comparative datasets spanning multiple waves has increased, and more and more studies exploit these data (Fairbrother, 2014; Schmidt-Catran & Fairbrother, 2016). One crucial issue is how to model repeated cross-sectional survey data which are patterned both by multiple geographic groups as well as by multiple time points. This longitudinal dimension represents an additional clustering level in the hierarchical structure of the data and must be captured to avoid biased standard errors and coefficient estimates (Schmidt-Catran & Fairbrother, 2016; Schmidt-Catran et al., 2019). Schmidt-Catran and Fairbrother's (2016, p. 23) general recommendation is

[4] For descriptive statistics see appendix Table 4 and 5.

[5] Since ESS changed its income groups from 12 categories to deciles from 2008 on, which are not comparable, I use imputed values for the first three waves (for further operation see http://www.talkstats.com/archive/index.php/t-44664.html).

[6] 17 countries had < 1% of missing values, 8 countries between 1–2% and two (smaller) countries had outliers with < 3.5% missing values.

"to include random effects at all potentially relevant levels". Therefore, I employ a three-level model in which individuals are nested in country-years, and in turn in countries. This approach is known as "hybrid multilevel model" or "random effects within-between model". It can formally be described as follows, with individuals at level one (i), country-years at level two (t) and countries at level three (j):

$$y_{jti} = \beta_{0t} + \beta_1 X_{jti} + \gamma_{WE}\left(Z_{jt} - \overline{Z}_j\right) + \gamma_{BE}\overline{Z}_j + v_j + u_{jt} + e_{jti}$$

The model includes the constant β_{0t} controlling for a time trend, the residuals v_j, u_{jt} und e_{jti} and the individual-level vector X_{jti} with its coefficient β_1. We include a time trend (as year dummies) in order to control for global time trends (Schmidt-Catran & Fairbrother, 2016, p. 129). The country variable Z_{jt} can vary between countries and also over time. To model these patterns correctly the macrolevel data is spilt in two components: one time-invariant (between countries) and one time-varying (within countries). Technically, the between variable is calculated as the mean value $\overline{Z}_j$ of all Z_{jt} for each country, and the within component is calculated by demeaning the yearly values Z_{jt} using $\overline{Z}_j$ (Fairbrother, 2014). Since $\left(Z_{jt} - \overline{Z}_j\right)$ is centered at the group mean and orthogonal to $\overline{Z}_j$, the two variables are uncorrelated and can be included simultaneously in a model (Fairbrother, 2014; Tormos et al., 2017), and hence the macro indicators are included as pairs in all multilevel models. The separate consideration of time-varying and time-invariant effects allows for the estimation of "pure" time-varying effects adjusted for country effects, like in fixed-effects modeling, with the additional advantage that random effects within-between models "provide less biased estimates in the presence of unobserved country-heterogeneity" (Schmidt-Catran et al., 2019, p. 112). The pooled dataset of repeated cross-sectional surveys also increases the statistical power of the analyses (Schmidt-Catran et al., 2019).

7.1 Linear Probability Models Versus Ordinal Logistic Models

There has been a long-standing discussion about using linear or nonlinear regression functions in the case of ordinal dependent variables such as the fear of crime item used in the current analysis. Advantages of the ordinal logistic model are that it does not arbitrarily make the assumption of equal distances between categories and can take possible floor and ceiling effects into account (Hedeker, 2015; Winship & Mare, 1984). Liddell and Kruschke (2018) and Ferrer-i-Carbonell and Frijters (2004) showed that treating ordinal data as continuous can produce false alarm errors and failures to detect effects. Yet, like any other regression, ordinal regression is subject to various assumptions. Williams (2016) showed that considerable errors can occur in ordinal models if the proportional odds assumption is not adhered to. In the current case, the Brant test for ordinal logistic regression rejected the parallel line test assumption which speaks against the use of an ordinal regression (see Online Supplementary Information, Table A1). Robitzsch (2020) also showed that ordinal modelling is not always superior when having ordinal scaled outcome variables.

Linear probability models have been advocated in recent years as a viable alternative to nonlinear regression and their interpretative pitfalls (Breen & Karlson, 2013; Breen et al., 2018; Mood, 2010). Coefficients can be more easily compared between models. In multilevel models, linear regression allows for a straight-forward calculation of variance components and their proportional changes between models; this is not possible in logistic regression models. Therefore, I decided to base my analysis on linear regression models. Yet, in order to guard

against potential misspecifications, I compare the linear models to ordinal logistic multilevel models (see 8.1 Regression diagnostics and robustness checks). STATA 16 and 17 was used for all computations. Considering the small sample of 27 countries, I use REML (Elff et al., 2021) and include a maximum of two pairs of context-level predictors with a view to the reliability of estimates. The model selection has been carried out using AIC based on ML.

8 Results

A descriptive look at the trends of the raw values of fear of crime over the nine waves of ESS pooled over all 27 countries shows that a large majority of people felt 'safe' (around 50 percent) or 'very safe' (slightly less than 30 percent) when walking in their local area after dark (Fig. 3). Looking at the development of the four categories of fear of crime over time, there was an increase in the 'very safe' category and a decrease in the 'unsafe' category after 2010. Around 2008, slightly more people felt 'unsafe', which may indicate an influence of the financial crisis on people's perception. On the whole, however, the development of fear of crime has been relatively stable.

Yet, considerable differences exist between countries. As found in previous studies, people in the Nordic countries reported lower levels of fear of crime while people in the Mediterranean and Eastern European countries reported higher levels (Hummelsheim et al., 2011). To allow for a visual comparison of all individual countries, Fig. 4 switches from four separate categories to single mean line plots which necessarily reduce the information.

An exploratory look these line plots by countries reveals divergent trends Many countries show steadily decreasing levels of fear (Finland, Netherlands, Norway, Slovakia, UK), others show temporary or continuous increases (Cyprus, Greece, Estonia, Portugal), but there does not seem to be a uniform pattern easily linked to the financial crisis.

As an exploration of the relationship between fear of crime and one macro-level indicator variable over time, Fig. 5[7] plots the bivariate between- and within-country association between fear and GDP simultaneously. The bold black line shows the overall trend between countries, indicating a strong negative relationship between a country's economic performance and fear of crime. The fine gray lines represent the changes over time within countries. Most of the gray lines show a similar negative association as the between-country association, implying that changes of GDP over time (controlling for level differences in GDP) is negatively related to changes of fear of crime in most countries, but there are also countries where the within-relationship is positive (e.g. Bulgaria, Greece). A similar picture can be observed for other bivariate associations (see Online Supplementary Information, Figs. A5–A8). This bivariate plot illustrates the advantages of using comparative longitudinal data compared to simple cross-sectional data.

Applying a bottom-up modeling approach (Hox, 2010), the empty model without predictors shows significant group-level shares of variance, with 9.8% of the total variance in fear of crime due to differences between countries, and 1.3% due to country-year variation (Table 1). Thus, the variance components indicate a relative stability of cross-country differences and a considerable degree of inertia of societal-level phenomena over time which restricts the potential magnitude of longitudinal effects. This finding is in line with recent research on other outcomes such as demand for redistribution, non-standard employment,

[7] See Schmidt-Catran et al. (2019) for syntax.

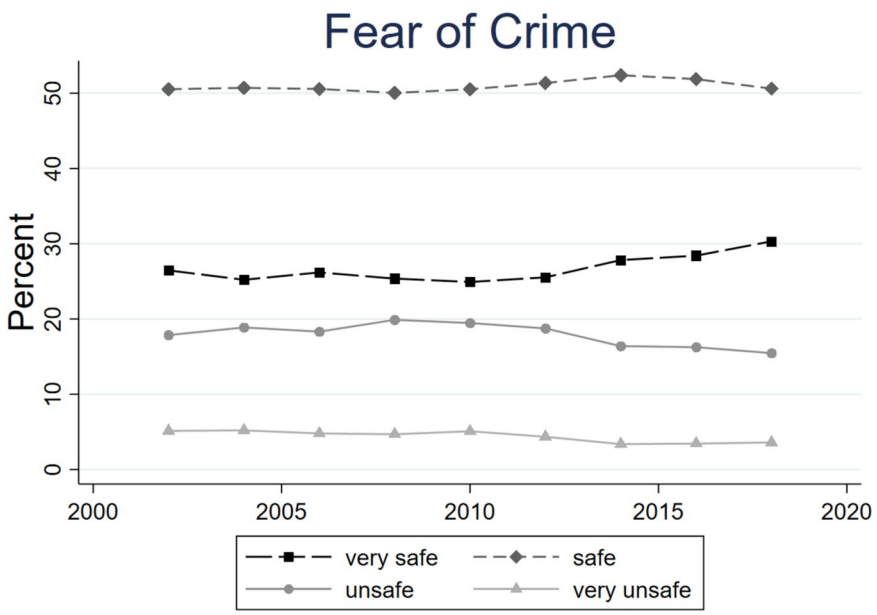

Fig. 3 Development of Fear of Crime (very save-very unsafe) pooled over all 27 countries

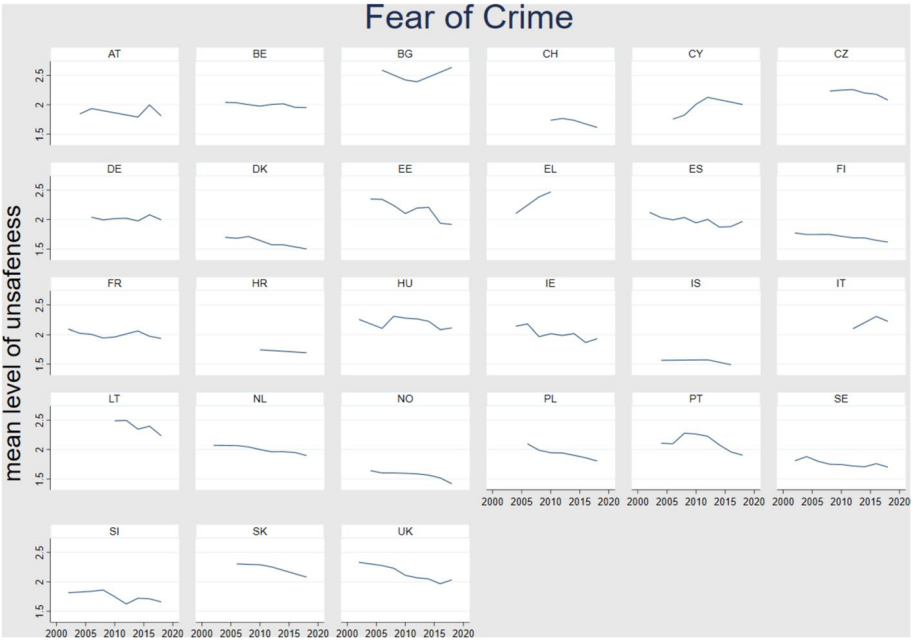

Fig. 4 Mean values of fear of crime by country over time (2002–2018). The mean is calculated using the points 1 (very safe) to 4 (very unsafe). AT Austria, BE Belgium, BG Bulgaria, CH Switzerland, CY Cyprus, CZ Czech Republic, DE Germany, DK Denmark, EE Estonia, EL Greece, ES Spain, FI Finland, FR France, HR Croatia, HU Hungary, IE Ireland, IS Iceland, IT Italy, LT Lithuania, NL Netherlands, NO Norway, PL Poland, PT Portugal, SE Sweden, SI Slovenia, SK Slovakia, UK United Kingdom

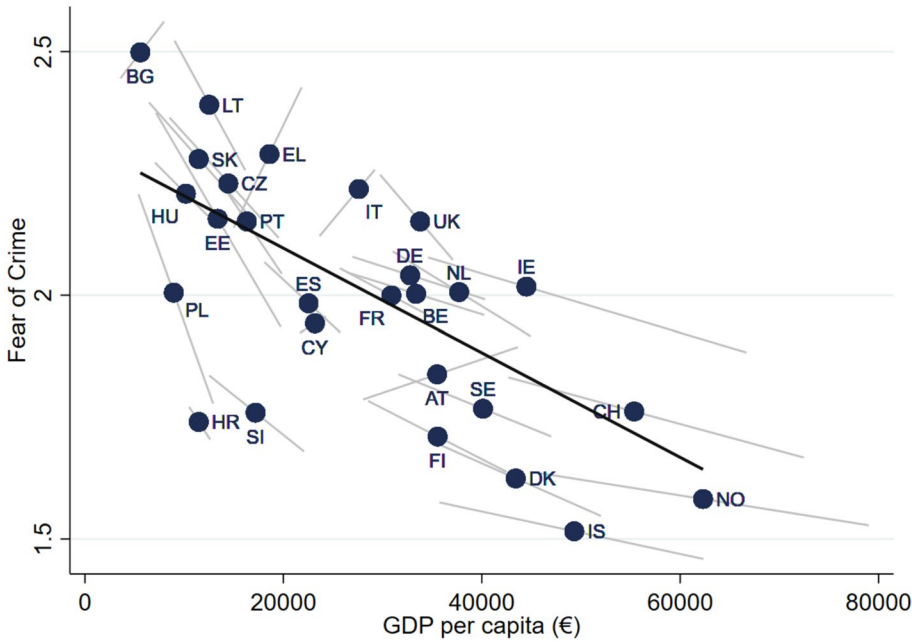

Fig. 5 Bivariate country-level relationships between fear of crime and GDP per capita. Black bold line: between country effect; grey thin lines: within-country effects. AT Austria, BE Belgium, BG Bulgaria, CH Switzerland, CY Cyprus, CZ Czech Republic, DE Germany, DK Denmark, EE Estonia, EL Greece, ES Spain, FI Finland, FR France, HR Croatia, HU Hungary, IE Ireland, IS Iceland, IT Italy, LT Lithuania, NL Netherlands, NO Norway, PL Poland, PT Portugal, SE Sweden, SI Slovenia, SK Slovakia, UK United Kingdom

perceived ethnic threat, basic human values, and trust (Haapanala, 2021; Kroknes et al., 2015; Lo Iacono & Quaranta, 2019; Meulemann et al., 2018; Schmidt-Catran, 2016; Schmidt-Catran & Fairbrother, 2016; Tormos et al., 2017).

Individual respondents' characteristics are added in model 2 and show very similar effects as in previous studies on fear of crime (see for example: Hummelsheim et al., 2011). The relationship between age and feelings of insecurity is U-shaped: younger and older respondents feel more insecure than middle-aged respondents. The negative coefficients of simple and quadratic education years indicate an increasingly strong fear-reducing effect at higher levels of education. Higher income, too, is associated with lower feelings of insecurity. Women show higher fear of crime. Being unemployed and a victimization experience are connected with more fear. People in more urbanized areas report more fear of crime. Controlling for the sociodemographic composition of the respective populations leads to moderate reductions of country-level variance by 18.9% and of the country-year-level (within) variance by 14.8%. When adding also the annual dummy variables the country-year-level variance even decreases by 36.6% compared to the null model. The coefficients for the annual dummy variables indicate that there was in fact a global downward trend in fear of crime starting to become significant in 2012. This argues against my assumption that the financial crisis increased fear of crime. The finding that more than a third of the within-country variance is explained by changes in individual-level sociodemographic composition and by a global time trend further reduces the potential for country-specific

Table 1 Null-model and conditional model with individual-level predictors and time trend

	M0		M1		M2	
	Coefficients	SE	Coefficients	SE	Coefficients	SE
Education (in years)			− 0.067***	0.001	− 0.067***	0.001
Education (in years)^2			− 0.014***	0.001	− 0.014***	0.001
Age			0.058***	0.001	0.058***	0.001
Age^2			0.034***	0.001	0.034***	0.001
Female			0.357***	0.003	0.357***	0.003
Unemployed			0.017**	0.006	0.017**	0.006
Victimization			0.224***	0.003	0.223***	0.003
Urbanization (ref. town)						
big city			0.109***	0.004	0.109***	0.004
suburb			0.040***	0.004	0.040***	0.004
village			− 0.190***	0.003	− 0.190***	0.003
country side			− 0.238***	0.006	− 0.238***	0.006
Income (ref. 5)						
1			0.092***	0.006	0.092***	0.006
2			0.057***	0.006	0.057***	0.006
3			0.038***	0.006	0.038***	0.006
4			0.020***	0.006	0.020***	0.006
6			-0.012 +	0.006	-0.012 +	0.006
7			-0.029***	0.006	-0.029***	0.006
8			-0.055***	0.006	-0.055***	0.007
9			− 0.067***	0.007	− 0.067***	0.007
10			− 0.1130***	0.007	− 0.113***	0.005
Years (ref. 2006)						
2002					0.039	0.032
2004					− 0.018	0.027
2008					0.000	0.023
2010					− 0.025	0.023
2012					− 0.042 +	0.023
2014					− 0.069**	0.024
2016					− 0.086***	0.024
2018					− 0.117***	0.022
Constant	1.987***	0.049	1.777***	0.044	1.823***	0.047
Var (Country)	0.062***	0.018	0.051***	0.014	0.051***	0.015
Var (Country-years)	0.008***	0.001	0.007***	0.001	0.005***	0.001
Var (Individual-level)	0.565***	0.001	0.496***	0.001	0.496***	0.001
AIC	727,443		685,193		685,225	

Standard errors in second column; + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; N = 320,507 individuals, N = 176 country-years, N = 27 countries. AICs calculated in models using ML (instead of REML) estimation. Missing values of categorical variables included as a residual category but not reported

time-varying influences on changes in fear. Model M2 serves as the baseline model for all subsequent models with higher-level predictors.

Table 2 Linear 3-level models (level 1 variables and time dummies included, but not shown)

	M3		M4		M5		M6		M7	
	coefficients	SE	coefficients	SE	coefficients	SE	coefficients	SE	coefficients	SE
GDP (BE)	−0.145***	0.036								
GDP (WE)	−0.005	0.030								
Unemployment rate (BE)			0.141**	0.054						
Unemployment rate (WE)			0.010	0.011						
Gini (BE)					0.133***	0.039				
Gini (WE)					0.024	0.015				
In-kind expenditures (BE)							−0.163***	0.030		
In-kind expenditures (WE)							−0.006	0.023		
Homicide rate (BE)									0.101*	0.042
Homicide rate (WE)									0.059***	0.014
Constant	1.787***	0.038	1.794***	0.043	1.800***	0.040	1.796***	0.034	1.794***	0.043
Var (Country)	0.031***	0.009	0.042***	0.012	0.036***	0.011	0.024***	0.007	0.043***	0.012
Var (Country-years)	0.005***	0.001	0.005***	0.001	0.005***	0.001	0.0065**	0.001	0.005***	0.001
Var (Individual-level)	0.496***	0.001	0.496***	0.001	0.496***	0.001	0.496***	0.001	0.496***	0.001
AIC	685,216		685,222		685,216		685,209		685,206	

$+p<0.10$, * $p<0.05$, ** p 0.01, *** $p<0.001$, N = 320,507 individuals, N = 176 country-years, N = 27 countries

Level 1 variables and annual dummy variables as in model 2 are not shown, but are included in all models. AICs calculated in models using ML (instead of REML) estimation

In the next step, each pair of country-level indicators (decomposed into its time-varying and time-invariant part) is introduced into the model at a time (Table 2, models M3–M7). While the four socioeconomic predictor-pairs show the same pattern of significant time-invariant between-effects and non-significant time-varying within-effects, the homicide rate is the only predictor to have both a significant between- and within-effect. In more detail, a higher level of GDP is linked to a lower level of fear of crime (model 3, B_{be}: − 0.145, $p < 0.001$), reducing the between-country variance by 38.6%. Thus, hypothesis 1b is confirmed but hypothesis 1a is not. A higher unemployment rate (model 4, $B_{be} = 0.141$, $p < 0.01$) and a higher Gini coefficient (model 5, $B_{be} = 0.133$, $p < 0.001$) both are related to stronger feelings of insecurity when compared between countries confirming hypotheses H2b and H3b, but the within-country parts of these effects are not significant, therefore hypotheses H2a and H3a cannot be confirmed. Model 6 shows the impact of in-kind expenditures on families and children on fear. The between component is significantly associated with lower fear of crime ($B_{be} = -0.163$, $p < 0.001$) and reduces the unexplained variance at the between-country level by 53% which represents the strongest effect on fear of crime. This is in line with previous cross-sectional research (Hummelsheim et al., 2011; Vieno et al., 2013; Visser et al., 2013). Yet, as with the other predictors, there is no longitudinal effect of in-kind expenditures on fear, and hypothesis H4a cannot be confirmed.

Finally, model 7 shows the time-varying and time-invariant effects of the homicide rate. Both the within and between components have a reinforcing effect on fear of crime ($B_{we} = 0.059$, $p < 0.001$; $B_{be} = 0.101$, $p < 0.05$) confirming both hypotheses H5a and H5b. The predictor pair reduces the variance by 11.2% at the country-year (within) level and 16.2% at the country (between) level compared to the baseline model 2. The AIC comparison with the base model indicates the best model fit compared to the other one-pair models. As this study is the first to use the homicide rate rather than total crime rate in relation fear of crime based on ESS data, this finding may indicate that previous research has underestimated the role of actual crime in generating fear of crime.

Summarizing models 3–7, all hypotheses about between-country (time-invariant) effects have been confirmed, while with one exception the within-country (time-varying) predictors show no effects. Previous studies of social cognitions and attitudes using the same modeling approach also found less and smaller time-varying compared to time-invariant effects (Meulemann et al., 2018; Schmidt-Catran et al., 2019; Tormos et al., 2017).

Taking the analysis one step further, models 8–10 (Table 3) include the strongest predictor, in-kind expenditures for families and children, simultaneously with one of the other predictors pairs each in order to address the problem of confounding processes which applies to longitudinal analyses, too (Rohrer & Murayama, 2023). Models testing in-kind expenditures against GDP (M9) and Gini (M10), respectively, show that the time-invariant effects of these socioeconomic predictors are rendered marginally significant (Gini) or completely insignificant (GDP) while the time-invariant effect of in-kind expenditures remains strong, confirming the key conclusion by Hummelsheim et al (2011) that social policies are more protective against feelings of insecurity than economic prosperity and social inequality. When modelled together with the homicide rate (M8), the between effect of in-kind expenditures is only reduced by 10% while the between effect of the homicide rate is reduced by about half and rendered marginally significant. However, the time-varying component of the homicide rate becomes even slightly stronger and remains highly significant. The AIC of this model (M8) indicates the best fit of all models.

Table 3 Linear 3-level models—2 pairs

	M8		M9		M10	
	Coef	SE	Coef	SE	Coef	SE
GDP (BE)			−0.047	0.046		
GDP (WE)			−0.017	0.035		
Gini (BE)					0.060+	0.036
Gini (WE)					0.024	0.015
In-kind expenditures (BE)	−0.147***	0.030	−0.130***	0.045	−0.133***	0.034
In-kind expenditures (WE)	−0.004	0.019	0.013	0.026	0.005	0.023
Homicide rate (BE)	0.055+	0.032				
Homicide rate (WE)	0.068***	0.015				
Constant	1.787***	0.033	1.792***	0.034	1.798***	0.033
Var (Country)	0.022***	0.007	0.024***	0.007	0.022***	0.007
Var (Country-years)	0.005***	0.001	0.005***	0.001	0.005***	0.001
Var (Individual-level)	0.496***	0.001	0.496***	0.001	0.496***	0.001
AIC	685,192		685,211		685,207	

+p 0.10, * p < 0.05, ** p < 0.01, *** p < p .001, N = 320,507 individuals, N = 176 country-years, N = 27 countries. Level 1 variables are not shown, but are included in all models. AICs calculated in models using ML (instead of REML) estimation

8.1 Regression Diagnostics and Robustness Checks

Considering the ordinal nature of the dependent variable I also applied ordinal logistic regression to all models, with very similar results: All country-level between- and within effects were equivalent in terms of significance, direction, and relative strength when comparing linear and nonlinear models (see Online Supplementary Information, Tables A2 & A3). The improvement of the models (measured by the proportional reduction of variance in the linear models, and by the improvement of AIC in the logistic models) was also almost identical to the linear models (see Online Supplementary Information, Tables A2, A3 & A4). Since both linear and ordinal models produce the similar results, I consider the findings as stable. In addition, to check for possible floor or ceiling effects, I looked at the distribution of the dependent variable by country (see Online Supplementary Information, Fig. A1). Most countries show a similar pattern, with the largest groups of respondents feeling secure and only a small number of people feeling very insecure which would indicate a floor effect. However, we are primarily interested in the country-level effects, and the mean values of fear are in the middle ranges of the distribution in all countries where linear regression results have shown to deviate less from ordinal logistic regression (Winship & Mare, 1984).

The typically very low number of group-level cases in European cross-cultural comparative studies poses estimation problems, in particular vulnerability to outliers, that defy simple solutions (Hox, 2010; Leeuw et al., 2012; Schmidt-Catran et al., 2019; Stegmueller, 2013). To address this problem, I tested whether results changed if one country at a time was excluded. This was not the case for models 3, 4, 6, and 7 but for model 5: When Hungary and Lithuania were excluded, the within-effect of Gini became significant. In model 8, the omission of a country led in most cases to a nonsignificant (14 times) and marginally

(12 times) between effect of the homicide rate. However, the within-effect of the homicide rate stayed robust in all cases.

I also computed DFBETAs[8] to identify influential cases on a single coefficient. Several influential countries were found for some of the country predictors (see Online Supplementary Information, Table A5 & A6). In short, dropping influential cases did not substantially change the effects of predictors in models with one predictor pair. Schmidt-Catran et al., (2019, p. 122) advise against the "blind exclusion" of countries on the basis of regression diagnostics and instead recommend a careful exploration of individual cases. Recent simulations have shown that REML can produce reliable estimates even with small country samples (Elff et al., 2021).

Finally, I also ran models without annual year dummies. These models produced significant time-varying (within country) effects of GDP and in-kind expenditures on fear of crime, in line with the hypotheses on time-varying effects. While the purpose of the year dummy variables is to control for global time trends and unobserved variance at the temporal level, technically they absorb large shares of the within-country variance of the predictors of substantive interest. As most countries show a relatively uniform upward trend of increasing in-kind expenditures for families and children, there may simply be insufficient country-specific variation in these trends to hold against the global time trend.

9 Discussion

Fear of crime is a multifaceted social cognition. Previous studies have shown that macro-level, societal conditions and social policies affect people's perceptions of crime-related insecurities. Following the generalized insecurity thesis, fear of crime has been seen as an expression of broader and more diffuse social insecurities. Almost all of this research was based on cross-sectional analyses, and the effects of changes over time in macro-level conditions have not yet been considered. Based on nine waves of the European Social Survey from 2002 to 2018, this study attempted to fill this void and shed light on the question of how changes in socio-economic conditions and social policies – in particular following the 2008 financial crisis – have affected fear of crime in European countries.

The average fear of crime declined over the period 2002 to 2018 with slight temporary increases between 2008 and 2012 which might hint at a fear-inducing effect of the financial crisis. Yet, looking at diverging trends within individual countries, the longitudinal profiles do not reveal a clear pattern. The cross-country comparison, though, confirms previously found patterns: countries belonging to the cluster of universal welfare regimes show the lowest levels and eastern European countries show the highest levels of fear of crime, with the continental European, South European and Anglo-Saxon countries in between (Ejrnæs & Scherg, 2022; Hummelsheim et al., 2011). As in these earlier cross-sectional studies, social expenditures in-kind for families and children prove the single strongest explanatory variable for country differences in fear of crime, accounting for half of the time-invariant between-country variance. This finding holds when tested against other macro-level variables such as GDP and the unemployment rate which are rendered nonsignificant in models together with social expenditures. In short, social policies geared at supporting people to master their own lives are effective in preventing generalized insecurities. Compared

[8] See Schmidt-Catran et al. (2019) for syntax.

with previous studies, this study uses a larger data base spanning almost two decades and providing more robust evidence.

However, the main rationale for using multiple survey waves was to shift the analytical focus from the time-invariant country differences to the time-varying within-country variation in fear of crime. The longitudinal analysis of comparative survey data is deemed to be superior in dealing with unobserved heterogeneity and coming closer to a causal interpretation of effects (Schmidt-Catran et al., 2019, p. 120). Yet, most hypotheses about time-varying effects of macro-level conditions on fear of crime had to be rejected, and the homicide rate turned out to be the only significant within-country predictor which, in fact, was stronger than the between-country predictor. The effect of the homicide rate on fear of crime is a novel finding as previous studies have (mainly) used general crime rates which tended to show weak or no association with fear of crime. A similar time-varying effect of the homicide rate was recently found by Karstedt and Endtricht (2022) in relation to public punitiveness in European countries, and together these findings support an 'objectivist' interpretation that public perceptions of crime are to some extend reflective of actual changes in serious crime (Karstedt & Endtricht, 2022, p. 1125). As the homicide rate has decreased considerably since the 1990s in most European countries, the improvement in subjective feelings of security can be partly attributed to this crime drop.

But how can we understand the absence of any significant influences of changes in macro-level socioeconomic conditions and social policies on fear of crime during a period that included the 2008 financial crisis and its aftermath that gripped European countries to varying degrees? The headline finding of this analysis is that the consequences of the financial crisis for people's well-being and social perceptions did not extend to fear of crime. The economic crisis which manifested itself in a recession and rising unemployment rates did not lead to an immediate or medium-term increase in crime-related feelings of insecurities. This finding mirrors research on the development of generalized trust during and after the financial crisis (Glatz & Eder, 2020; Iglic et al. 2021) and can be seen as evidence for a certain degree of resilience of European societies.

The interpretation of the absence of an effect of changes in social expenditures appears more complicated. Whereas GDP did decline and unemployment did increase in some countries but apparently without impacting fear, social expenditures in-kind for families and children where on a more or less continuously increasing trajectory in most countries throughout the period and also during the financial crisis (in contrast to in-cash expenditures for families and children which were more volatile), with relatively little variation in this upward trend between countries (Nygård et al., 2019). If these increases had the theoretically expected diminishing effect on fear of crime, then the lack of strong variation in the time-varying component of this indicator were preventing it from having a statistically significant effect in models controlling for a time trend.

Given the dearth of previous longitudinal analyses of fear of crime it is useful in reflecting on these findings to look once more to the much broader research field on trust. It is a general finding that county-level scores of generalized trust tend to be rather stable and unresponsive to macro-level changes (Bergh & Bjørnskov, 2014; Glatz & Eder, 2020; Nannestad, 2008), leading Delhey and Newton (2005, p. 324) to suppose that trust is "tightly integrated into a single syndrome of ethical/cultural, social, economic, and structural conditions" which renders longitudinal analyses with the aim to disentangle causes and effects futile. Applied to fear, this view is supported by the initial finding that 90 percent of the country-level variance of fear is time-invariant between countries, and only 10 percent is time-varying within countries thus reflecting very stable country differences over a period

of nearly two decades. In this situation, the strong cross-sectional association between social expenditures and fear of crime which has been confirmed in this study should not be dismissed lightly as unobserved country heterogeneity but considered as a potentially substantive finding. To move research on the effects of welfare policies on insecurity perceptions forward more studies focusing on the formation and stability of these perceptions during the life course would be useful.

Appendix

See Tables 4, 5 and 6.

Table 4 Descriptive statistics—individual variables (N = 327,838)

	Mean | Percent	SD	Range	Missing %
Fear of crime				
very safe	26.5%			
safe	50.5%			
unsafe	17.8%			
very unsafe	4.4%			
missing	1.0%			
Urbanization				
big city	19.9%			
suburb	11.8%			
town	31.0%			
village	30.4%			
country side	6.7%			
missing	0.2%			
Income				
1	7.6%			
2	8.2%			
3	8.2%			
4	8.3%			
5	8.1%			
6	7.9%			
7	7.8%			
8	7.5%			
9	6.6%			
10	6.6%			
missing	23.3%			
Unemployed	4.3%			
Victimization	17.3%			
Female	53.4%			
Age	48.77	18.63	15–94	0.33%
Education (years)	12.51	3.79	5–21	1.07%

Table 5 Descriptive statistics—L2 variables

Variable	Mean	Std. Dev	Min	Max	Source
GINI (0–100)	29.1	4	20.9	40.2	Eurostat
Unemployment rate (% of active population)	8.5	4.4	2.2	27.5	Eurostat
GDP (€ per capita)	27,088.4	15,473.2	1760	79,000	Eurostat
In-kind expenditures (€ per capita)	228.6	265.8	0	1390.8	Eurostat
Homicide rate (per 100,000)	1.6	1.7	0	12	Eurostat/ UNODC
GINI (BE)	29.1	3.5	23.5	35.3	
GINI (WE)	0	1.7	− 8.7	6.5	
Unemployment rate (BE)	8.5	3.1	3.8	16	
Unemployment rate (WE)	0	3	− 7.9	11.8	
GDP (BE)	27,088.4	14,724.8	5016.9	66,894.5	
GDP (WE)	0	4753.9	− 19,710.6	24,433.7	
In-kind expenditures (BE)	227.3	282.4	7.2	1061	
In-kind expenditures (WE)	0	86.6	− 542.5	329.8	
Homicide rate (BE)	1.6	1.5	0.5	7.3	
Homicide rate (WE)	0	0.8	− 3.8	4.8	

Table 6 L2 correlations

	In-kind expenditures	Unemployment Rate	GDP	GINI	Homicide Rate
In-kind expenditures	0.12	-0.42	0.72	-0.50	-0.29
Unemployment Rate	-0.05	-0.03	-0.52	0.51	0.21
GDP	0.64	-0.23	0.14	-0.40	-0.40
GINI	-0.06	0.05	-0.02	0.39	0.00
Homicide Rate	-0.18	0.15	-0.38	0.05	0.02

Grey = Within variables, White = between variables; Social expenditures on Family and Children, unemployment rate, GDP and Homicide = per capita.

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