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When Crisis Strikes: How Natural Disasters Transform Fairness Norms Across Generations

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When Crisis Strikes: How Natural Disasters Transform Fairness Norms Across Generations

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Abstract

While the direct impacts of natural disasters are well studied, a less explored consequence is the scarcity they create and the resulting reallocation of resources. This paper examines this second-order effect by analyzing how disaster-driven scarcity reshapes fairness considerations within society. Using data from the International Disaster Database (EM-DAT) and the European Social Survey (ESS), we show that disaster exposure increases perceptions of *solidarity-driven fairness*, including social support, rewards for effort, and equal access to medical and police services, while reducing perceptions of *scarcity-driven fairness* such as wage equality for low earners, access to education, the functioning of the political system, and overall societal fairness. As climate-related disasters are a cross-border phenomenon, we also study spillovers from neighboring countries and find that such shocks can strengthen solidarity-based fairness while simultaneously heightening skepticism toward institutional and societal fairness. Finally, we explore mechanisms, i.e., trust in institutions, foreign direct investment, EU funds, trade, GDP growth, and income that condition these relationships and shape how individuals interpret fairness norms related to equality, justice, and need after a disaster.

Keywords: Fairness; Natural Disasters; Justice; Equality; Climate Change

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1 Introduction

The climate crisis, encompassing climate change and environmental degradation, has led to an increase in natural disasters, prompting countries to raise awareness (Papadaki et al., 2023) and adopt sustainability initiatives (Kratochvil and Misik, 2020; Rodríguez-Pose, 2018). Natural disasters have resulted in unprecedented human and economic losses, especially in particularly vulnerable countries, further nudging climate action and the need for coordinated and timely response and recovery efforts to effectively manage the threat they pose (Koundouri, 2023).

We illustrate the number of recorded natural disasters worldwide between 1900 and 2023 in Figure 1. Notably, whereas in the early decades of the twentieth century we observe a rather low number of incidents (ypically below fifty incidents per year), this trend is reversed after the 1960's and is followed by a sharper rise throughout the 1970s and 1980s. Already in the late 1990s, the number of incidents reached roughly three hundred events on an annual basis. More recent numbers (from 2000 onward) the numbers are ranging between 300 and 450 cases per year.

The rising numbers have attracted the attention of scientists across fields. The economic consequences of natural disasters have been widely examined, and particular attention has been given to to immediate losses, recovery patterns, and long-term development outcomes. Importantly, as disasters can create acute scarcity in a sudden way, this can trigger a reallocation resources that are already constrained and consequently drastically reshaped material conditions which can unsettle existing social balances. As a result individuals are influenced as to how they assess the fairness of resource distribution when pressure intensifies. These are second order effects that can shape fairness norms and perceptions of justice in the aftermath of a shock. Given that fairness, often

defined as the ethical distribution of resources, plays a critical role in sustaining social cohesion, trust, and cooperative behavior (Crisp, 2003) it is essential to uncover both the economic but also the social implications of natural disasters.

[INSERT FIGURE 1 HERE]

To cover this gap in the literature we examine how natural disasters impact norms of fairness. Specifically we focus on how these events shape public perceptions of fairness across the context of European countries. To implement our analysis, we resort to two sources, i.e., the International Disaster Database (EM-DAT) and the European Social Survey (ESS). To construct our variable of exposure to a shock and study the interplay with fairness, we link each individual who has experienced a natural disaster shock at the Nuts 1 level to their perceptions of fairness. In doing so we cover a broad range of dimensions, including equality, justice, and need. As most of our variables are ordered we use an ordered probit model and implement a multilevel analysis, studying how individual exposure to an aggregate shock affects individual attitudes towards fairness.

One of the novelties of our study is that distinguish between two broad categories of fairness norms that disasters may shape in opposite directions. The first category, is named *solidarity-driven fairness*. It reflects domains within which collective support, institutional protection, and interpersonal equality is important. Examples of such variables include social support, rewards for effort, and equal access to medical and police services.The second category is defined as *scarcity-driven fairness*. It captures perceptions that are linked to deeper structural opportunities and resource allocation. Examples of variables include wages for low earners, access to education, the functioning of the political system, and overall societal fairness. Implementing this distinction can provide us with a conceptual framework essential for understanding the dual nature of fairness

responses that may arise in the aftermath of a disaster shock.

Following this categorization we obtain two distinct effects. First, we observe a positive interplay between exposure to disasters and fairness. In this case disasters strengthen *solidarity-driven fairness*, social support, rewards for effort, and equal access to medical and police services. Second, we obtain a negative interplay between the two. In this case disasters weaken *scarcity-driven fairness*, i.e., they reduce wages for low earners, access to education, the functioning of the political system, and the broader fairness of society. These two distinct patterns highlight the fact that disaster shocks simultaneously can be associated with both positive and negative shifts across distinct dimensions of fairness.

As a follow up to our benchmark analysis, we implement a neighboring countries analysis. Analytically, given that climate change and the associated disasters are cross-border phenomena, we attempt to capture this element. Our underlying assumption is that the effects of disasters may extend beyond domestic exposure and shape fairness perceptions indirectly, i.e., via what individuals observe in neighboring countries. To capture this dimension, we construct measures of disaster shocks occurring in bordering states. We then link these to respondents' fairness attitudes. Our findings suggest that cross-border disaster exposure, similarly to domestic exposure, can reinforce solidarity-driven fairness. This can strengthen beliefs in social support, rewards for effort, and equal treatment by police and medical institutions. As in the benchmark case, it can weaken scarcity-driven fairness and reduce the perceived fairness of the political system, indicating that external disasters can heighten institutional skepticism.

It is important to note though, that unlike our initial prior, these reactions do necessarily mirror domestic effects in magnitude. There are several potential explanations for the observed discrepancy. As individuals interpret foreign shocks through indirect channels, such as perceptions of

regional instability, spillover risks, or comparisons with their own institutions, disasters occurring in neighboring-countries can heighten some fairness concerns while they can soften others. As a result, while cross-border shocks produce patterns that align with the same fairness typology they can differ in their strength and direction. This further highlights the fact that disaster impacts extend beyond national boundaries and reshape fairness norms through multiple pathways.

In the last part of the paper we explore some factor that may confer a mitigating or reinforcing effect. These factors can shape how people interpret shocks, e.g., trust in institutions, economic conditions, and financial flows. First, trust in institutions such as parliaments, political parties, politicians, the EU Parliament, the legal system, and the police plays a central role: higher trust tends to shift perceptions of fairness in areas like education, elite favoritism, and medical or police treatment. Second, economic resources also matter. EU funds, GDP, and income influence whether individuals view wages, social support, as fair following a disaster. Third, external economic flows, i.e., foreign direct investment and trade, further shape how people judge fairness in domains such as pay, and education. Overall, these mechanisms show that fairness perceptions after disasters do not emerge in isolation. As a matter of fact they depend on the broader political and economic environment that frames how people process and evaluate these shocks.

The paper is structured as follows. Section 2 reviews the existing literature on immigration and natural disasters. Section 3 introduces the data and measurement strategy. Section 4 outlines the empirical specification and identification strategy. Section 5 presents the main results. Section 6 provides evidence from bordering countries affected by disasters. Section 7 discusses several mechanisms, whereas Section 8 concludes.

2 Literature Review

The aim of this paper is to examine how natural disasters shape public attitudes toward fairness. In doing so we focus on the interaction between environmental shocks and fairness norms. We contribute to two established strands of research; i) the literature on fairness preferences, and ii) the extensive work documenting the societal and economic consequences of natural disasters.

Our novelty lies in examining an unusually broad range of fairness attitudes, which allows us to make three key contributions. First, by covering several aspects of fairness, we can distinguish between the two fairness types affected by disaster-driven scarcity: solidarity-driven fairness (e.g., social support, equal access to public services) and scarcity-driven fairness (e.g., wages, education, institutional justice). Second, we use our dataset in a way that allows us to study how individuals reassess fairness after observing a disaster taking place in a neighboring country. Third, we can account for a wide range of fairness indicators, and as such we can identify which specific fairness dimensions respond to disaster shocks in a positive or a negative way.

2.1 Fairness

The concept of fairness is deeply rooted in principles of resource allocation and equality. It also has an inter-generational aspect as it is often perceived as an obligation of each generation (Woodward, 2000). While fairness might appear to be an abstract concept, yet it can have very concrete and tangible implications in today's societies. Evidence suggests that it can influence the behavior of individuals in meaningful ways (Fehr and Schmidt, 1999) and can amend the views of people on what is fair, being the outcome of their beliefs, economic circumstances and social environment.

(Sommer et al., 2022; Fehr and Gächter, 2002). The associated literature suggests that these perceptions are far from uniform as they vary across and within societies, which is the type of variation we exploit in our analysis (Cappelen et al., 2013; Engel, 2011)..

Evidenced from an economics perspective, fairness is being studied in the context of several fields, e.g., welfare economics, behavioral economics, and distributive justice theory. Cental elements in all these studies are dimensions such as equity, equality, and need (Kahneman et al., 1986; Atkinson, 2015; Nozick, 1974; Sandel, 2010). They also highight the fact that individuals care deeply about fairness a and as such, these considerations need to be factored in policy making (Alesina and Giuliano, 2011; Alesina and La Ferrara, 2005; Fong, 2001). Luck also has a central role in this literature, as when people believe that outcomes arise from factors beyond an individual's control, e.g., luck, they tend to endorse redistribution and support policies that are in favor of a more equitable distribution of resources (Alesina and La Ferrara, 2005; Benabou and Tirole, 2006). This considerations also play a central role in topics like wage negotiations, where perceptions of just compensation play an important role (Akerlof, 1982; Rees, 1993).

The importance of fairness in decision making is also highlighted in the context of the experimental economics literature (Bolton, 1991; Fehr et al., 1993; Franciosi et al., 1995). Studies in the field, systematically report that individuals are often willing to forgo personal gains with the aim of reducing inequalities they perceive as unjust (Bolton and Ockenfels, 2000; Engelmann and Strobel, 2004; Wu and Roe, 2006).Experimental evidence further suggests that people have an inherent desire for fairness and are willing to punish unfair behavior, even at a personal cost (Fehr and Schmidt, 2001).

2.2 Natural Disasters

As discussed in Figure 1, the occurrence of natural disasters is increasing. Subsequently, this can have a detrimental effect on the entire world. Their impact is not symmetric and can vary significantly across regions, depending on a series of factors, e.g., the characteristics of local communities (Eriksen et al., 2005). As Alexander (2018) notes there is not a single definition of the term "natural disasters". One definition describes them as naturally occurring or human-made geologic conditions or events that pose a risk or potential danger to life or property (Bates and Jackson, 1980). Another perspective views them as an interaction between people and nature, The latter is shaped by the current state of adjustment in both human and natural systems (White, 2019). A third definition describes them as harmful elements of the physical environment caused by forces beyond human control (Burton and Kates, 1963). Overall, a more broad approach highlights that natural disasters can be understood as the probability of a potentially damaging event occurring within a specific time and area (Lütem, 1985). .

When perceived frm an economic perspective, the vulnerability of a country is shaped by its size, with larger countries often suffering greater losses (Cavallo et al., 2010). In such occasions, economic acitivity may be disrupted and lasting damage can be caused which can have devastating implications for the vulnerable populations (Hallegatte and Przyluski, 2010). It is not unlikely to evidence disasters that can prompt modernization and technological adoption (Skidmore and Toya, 2002). However, in the face of more severe events short-term growth is often hindered, especially in smaller economies (Klomp and Valckx, 2014). Evidence suggest that the occurrence of major disasters tends to exacerbate poverty and can lower the Human Development Index (Rodriguez-Oreggia, 2010). Economic inequality can heighten vulnerability by increasing the

share of individuals whole in extreme poverty, being a group particularly susceptible to disaster impacts (Chou et al., 2004). In line with the above arguments, both Kahn (2005) and Anbarci et al. (2005) find a positive relationship between the Gini coefficient and disaster-related fatalities, even after controlling for income levels.

2.3 Natural Disasters and Fairness

This paper aims to link fairness in the context of natural disasters. It is a tipc that has received limited attention, despite being importance for understanding the broader social dimension of disaster response and its side effects, i.e., redistributive justice, disaster relief, and resilience-building. Starmans et al. (2017) highlight that, when faced with such disparities, citizens tend to be highly concerned with the fairness of how relief is distributed. In a similar mode, Mazepus and Van Leeuwen (2020) show that perceptions of fairness directly shape how aid is allocated. This places fairness as a fundamental determinant of public support for disaster-related interventions. Evidence by Liu et al. (2019) illustrates that perceptions of whether assistance is distributed according to need and affectedness can significantly influence the preference of voters for disaster response policies.

Beyond the aspect of immediate relief, fairness also plays a critical role in broader decision-making related to climate change. This is evidenced particularly in discussions of justice within climate change adaptation planning. Given the fact that the impacts of climate change are unevenly distributed across regions and communities, exposure and vulnerability can vary substantially (Green, 2016). Koundouri et al. (2025) demonstrates that individuals' prior experience with disasters can shapes their perceptions of fairness and their preferences for public spending. This is

particularly important as it underscors the importance of fairness considerations throughout the full cycle of disaster response and adaptation.

3 Data and Measurement

To implement our analysis, we first link individuals' attitudes toward various aspects of fairness with the occurrence of natural disaster. Our date is derived from the European Social Survey (ESS). It covers a range of European countries and proxies for a broad and rich spectrum of personal fairness attitudes, such as equality, justice, and need. The occurrence of natural disasters is derived from EM-DAT. This is a global database covering the occurrence and magnitude of natural disasters daring from 1900 to the present. It includes events such as floods, storms, droughts, wildfires, earthquakes, tsunamis, and volcanic eruptions. For a disaster to be included in the EM-DAT database, it must meet at least one of the following criteria: (1) 10 or more people reported killed; (2) 100 or more people reported affected; (3) declaration of a state of emergency; or (4) a call for international assistance.

3.1 Natural Disasters Shock

Our variable of exposure to a disaster shock is constructed at the NUTS 1 regional level. Each individual is assigns a value based on the shock experienced. Analytically, our disaster shock variable is a binary variable, taking the value of 1 following a disaster shock in their region, and 0 if they have experienced no disaster shocks. This approach allows us to capture the differential effects of exposure to regional shocks on individuals, enabling us to analyze their potential impact.

Figure 2 documents the aggregated natural disaster shocks disaggregated at the Nuts 1 level

across Europe. The period covered ranges from 1974 to 2023. The map illustrates the spatial distribution of disasters such as floods, storms, and wildfires, highlighting regional differences in disaster severity as recorded in our sample. The data reveal that certain regions experience recurrent shocks over the years. The regions most exposed to natural disasters, based on the number of disaster shocks, are concentrated in Southern, Southeastern, and parts of Western Europe, while Northern and parts of Eastern Europe experience fewer disaster events.

[INSERT FIGURE 2 HERE]

3.2 Fairness Attitudes

In our analysis, we differentiate between what we define as solidarity-driven fairness and scarcity-driven fairness, two conceptually distinct but interrelated dimensions of distributive and procedural justice.

Solidarity-driven fairness refers to norms that emphasize mutual support, collective responsibility, and the equitable provision of public goods. These attitudes capture that society should assist those in need[1], that public institutions, such as the police[2] or healthcare providers[3], treat all social groups equally.

Moving to scarcity-driven fairness, they concern evaluations of fairness in the face of limited resources and competition. These evaluations include judgments about various aspects. Analyti-

[1]Measured with: "A society is fair when it takes care of those in need regardless of their contributions," on a scale from 1 = "Agree strongly" to 5 = "Disagree strongly."

[2]Measured on a scale from 1 = "Women are treated less fairly than men" to 3 = "Women and men are treated equally fairly."

[3]Measured with the same scale as police fairness: 1 = "Women are treated less fairly than men" to 3 = "Women and men are treated equally fairly."

cally these are i) wage fairness[4]; ii) equality of opportunity in education[5], and iii) the fairness of the broader political system[6]. The fact that we distinguish between these two fairness domains allows us to capture how natural disasters reshape both solidarity-based norms and fairness perceptions that emerge when individuals confront resource constraints.

We illustrate some of these fairness indicators in Figures 3 and 4 and they reveal substantial variation across Europe which we exploit in our analysis. Specifically, Figure 3 illustrates perceptions of fairness in education at the NUTS 1 level. They highligh marked regional divides, i.e., Nordic regions exhibit strong equality of opportunity, Western and Central Europe display more moderate levels, while Southern and Eastern Europe manifest considerably lower perceptions of educational fairness.

[INSERT FIGURE 3 HERE]

Gender fairness in police treatment is depicted at the NUTS 1 regional level. Substantial cross-country variation is observed here as well. Regions in Portugal, Spain, Switzerland, Slovenia, and Croatia report more equal treatment of women and men, whereas regions in France, Belgium, and Greece manifest lower perceived gender fairness. Pattern across other fairness dimensions are quite similar as well.

[INSERT FIGURE 4 HERE]

[4]Measured as whether respondents' gross pay is unfairly low, fair, or unfairly high, ranging from -4 = "Extremely low, unfair" to +4 = "Extremely high, unfair."

[5]Measured as whether everyone has a fair chance to achieve their desired level of education, from 0 ="Does not apply at all" to 10 = "Applies completely."

[6]Measured on a scale from 1 = "Not at all" to 5 ="A great deal," capturing whether the political system allows everyone to participate fairly.

3.3 Descriptive Statistics

Descriptive statistics from the ESS sample are reported in Table 5 and summarize both fairness perceptions and key demographic characteristics. Overall, we can make the following observations. Respondents view earnings for the bottom 10% of full-time workers as unfairly low. Similarly they judge their own gross pay to be slightly below what is fair. At the same time, perceptions of equal educational opportunity are relatively high, whereas assessments of fair political participation and societal fairness in rewarding effort fall take mid-range values. On the positive range fall views on gender fairness in policing and healthcare. Most individuals indicate that men and women receive comparable treatment.

The second set of interesting statistics is disaster exposure which is widespread in the sample. 88% of respondents report that their region experienced a natural disaster shock during the reference period. 90% report that at least one neighboring country was affected, highlighting the salience of trans-boundary shocks. The average age of the respondent is 52 years old, slightly more often female. The average respondent typically possesses mid-to-high levels of education. They are also more likely to be married or in a legally registered union, and they live in households averaging roughly 2.5 members. Taken together, the table portrays a population that is socio-demographically diverse, exhibits meaningful variation in fairness perceptions, and is extensively exposed, directly or indirectly, to natural disaster shocks.

[INSERT TABLE 5 HERE]

4 Empirical Strategy

We examine how exposure to natural disasters shapes individuals' perceptions of fairness across European countries using an ordered probit model, consistent with the ordinal nature of our fairness outcomes. Formally, we estimate:

$$y_{irs} = \alpha_0 + \alpha_1 \text{DisasterShock}_{irs} + \eta X_i + \phi_r + \lambda_s + \epsilon_{irs} \tag{1}$$

where y_{irs} denotes the fairness norms of individual i, residing in region r and participating in the European Social Survey (ESS) in round s. $DisasterShock_{irs}$ takes the value of 1 if individual i, residing in region r, experienced a disaster shock in round s, and 0 otherwise. Additionally, ϕ and λ denote fixed effects for region and round, respectively. We further include a vector of individual-level controls X_i, capturing age, gender, educational attainment, marital status, and household size, to account for socio-demographic heterogeneity commonly associated with fairness attitudes. To absorb confounding sources of variation, we incorporate region fixed effects ϕ_r, which net out time-invariant regional characteristics, such as geography, cultural factors, and baseline institutional quality, as well as round fixed effects λ_s, which capture common shocks, policy changes, and macroeconomic conditions affecting all regions in a given year. Standard errors are clustered at the NUTS-1 level to address within-region serial correlation in both disaster exposure and fairness perceptions over time.

A central identifying assumption of this approach is that, conditional on controls and fixed effects, natural disaster shocks are exogenous to unobserved time-varying determinants of fairness perceptions. Given that disasters are largely driven by climatological and geological processes

rather than by social, economic, or political factors, this assumption is plausible. Nevertheless, to strengthen credibility, our empirical design also conducts robustness checks (presented later) that account for neighboring-country disasters, interactions with institutional trust, and a battery of economic and financial variables, ensuring that our baseline estimates are not driven by omitted trends.

This framework allows us to isolate whether disaster exposure is systematically associated with shifts in fairness norms, distinguishing between solidarity-driven and scarcity-driven fairness responses.

5 Empirical Findings

Our findings in Table 1 illustrate how experiencing a natural disaster shock shapes solidarity-driven fairness (i.e., fairness norms linked to mutual support, collective responsibility, and equal treatment by public institutions). Across all four outcomes, disaster exposure is systematically related to shifts in these attitudes.

Column (1) shows that individuals exposed to a disaster are more likely to agree with the idea that society should help the poor without considering what they contribute. Column (2) similarly shows that disaster exposure is associated with a higher likelihood of agreeing with the idea that society is fair when hard-working people earn more than others. Columns (3) and (4) point to improved perceptions of institutional fairness. Individuals who experience a disaster are more likely to view both the police and healthcare services as treating men and women equally.

To sum up the findings of the table, our results demonstrate that disaster shocks uniformly reinforce solidarity-driven fairness. They tend to strengthen both beliefs about social support and

fair rewards, as well as perceptions of equal treatment within public institutions-highlighting the multidimensional nature of solidarity-based fairness norms.

[INSERT TABLE 1 HERE]

Table 2 examines how experiencing a natural disaster shock shapes scarcity-driven fairness, that is, fairness norms concerned with resource constraints, competition, and the equitable distribution of opportunities. Across all five outcomes, disaster exposure is consistently associated with less favorable assessments of fairness in these domains.

Column (1) shows that individuals who experience a disaster are more likely to judge the earnings of the bottom 10% as unfair, indicating a deterioration in wage-related fairness perceptions. Column (2) similarly reveals that disaster exposure increases the perception that one's own pay is unfair. In Column (3), disaster shocks are associated with lower perceived fairness in access to education. Column (4) shows a decline in perceptions that the political system ensures fair participation, and Column (5) indicates that individuals exposed to disasters are more likely to believe that society favors elites rather than treating all groups equitably. All effects are statistically significant.

Taken together, these patterns show that disaster shocks systematically erode scarcity-driven fairness norms, reducing individuals' confidence in the fairness of wages, opportunities, and political institutions.

[INSERT TABLE 2 HERE]

6 Bordering Countries Analysis

The aim of this section is to hihglihgt the cross border nature of natural disasters. Specifically we study how indirect exposure to natural disaster shocks, i.e., shocks experienced by neighboring countries, affect fairness norms within a country. This is a plausible assumption as environmental risks and their consequences do not stop at national borders. Therefore, individuals may form perceptions based not only on domestic exposure but also by observing disasters in nearby countries. Such cross-border shocks can operate in several ways. They can heighten a sense of shared vulnerability, or alter expectations about regional stability, or shape beliefs about institutional preparedness all of which may influence fairness attitudes. In order capture this cross-border dimension, we construct two measures of indirect exposure. First, we create a binary indicator. It takes teh valus of 1 if at least one neighboring country experienced a natural disaster shock in a given year, and 0 otherwise. Second, we construct a continuous measure that quantifies the overall intensity of cross-border exposure. To do so we sum up all disaster shocks across neighboring countries. This allows us to assess, both whether and how, the spillover effects of environmental shocks extend beyond national boundaries to shape fairness norms within a country.

These patterns are illustrated in the example of Figure 6. It shows the pattern of natural disaster shocks affecting Greece through the exposure of its neighboring countries, highlighting how the intensity of these shocks varies across time and borders. Greece shares land borders with Albania, North Macedonia, Bulgaria, and Turkey, and the figure reports the disaster shocks experienced by each of these countries individually from 2003 to 2023. It also presents a combined measure capturing the overall exposure of all neighboring countries during the same period, offering

a consolidated view of the transboundary pressures that may influence fairness perceptions within Greece.

[INSERT FIGURE 6 HERE]

Table 3 examines how natural disaster shocks in neighboring countries reshape fairness norms. The results show that cross-border shocks systematically strengthen solidarity-driven fairness, the set of attitudes reflecting mutual support, collective responsibility, and equal treatment by public institutions. When at least one neighboring country experiences a disaster, individuals are more likely to believe that effort is rewarded fairly, that society provides support to those in need, and that public institutions such as the police and healthcare services treat men and women equally. These patterns mirror, though more uniformly and strongly, the institutional components of solidarity-driven fairness observed in the domestic analysis. In contrast with the domestic results, however, cross-border disasters also increase several components of scarcity-driven fairness. Neighbor shocks are associated with more favorable views of wage fairness for the bottom 10% of earners and with a stronger perception that society fairly rewards high-status groups.

Taken together, the findings indicate a clear divergence between domestic and neighbor-driven disaster effects. Domestic disasters produce a mixed pattern, strengthening institutional equal, treatment norms while weakening fairness beliefs tied to resource constraints, whereas disasters in neighboring countries tend to raise both solidarity-driven and scarcity-driven fairness norms. This suggests that when disasters occur across a border rather than at home, individuals may respond less to resource scarcity and more to regional solidarity, comparison, and empathy mechanisms, resulting in more uniformly positive shifts in fairness perceptions.

[INSERT TABLE 3 HERE]

Table 4 examines how natural disaster shocks in neighboring countries shape scarcity-driven fairness, focusing on perceptions of whether the political system ensures fair participation. The results show that when at least one bordering country experiences a disaster shock, individuals become less likely to view their own political system as fair. This negative association is statistically significant at the 1% level, indicating that cross-border disasters can heighten concerns about institutional fairness, even when the shocks occur outside national boundaries.

[INSERT TABLE 4 HERE]

Table 5 provides a robustness check using an alternative measure of cross-border exposure, where we sum all natural disaster shocks occurring in neighboring countries. The results show that higher cumulative exposure in bordering countries is associated with stronger perceptions of institutional fairness. Column (1) indicates that individuals are more likely to believe that the police treat men and women equally when surrounding countries experience more disasters. Column (2) shows a similar pattern for perceptions of fairness in medical treatment across genders. At the same time, Column (3) suggests that greater exposure to neighboring countries reduces individuals' perceptions that their own pay is unfair. Together, these findings confirm that cross-border shocks shape fairness norms in meaningful ways, and that the direction of these effects depends on the specific fairness domain considered.

[INSERT TABLE 5 HERE]

Overall, this section shows that natural disasters occurring in neighboring countries meaningfully shape domestic fairness perceptions, revealing the importance of transboundary spillover

effects. When disasters strike nearby countries, individuals tend to update their beliefs about fairness, even without experiencing the shock directly, suggesting that people draw inferences from regional events and interpret them through mechanisms of shared vulnerability, comparison, and institutional expectations.

Across specifications, cross-border disaster shocks consistently strengthen solidarity, driven fairness norms, increasing perceptions that effort is rewarded fairly, that society supports those in need, and that public institutions such as the police and healthcare systems treat men and women equally. These effects are generally stronger and more uniform than those observed for domestic disasters, indicating that external shocks may amplify feelings of regional solidarity and reinforce beliefs about institutional fairness.

In contrast, the effects on scarcity-driven fairness are less clear. Neighboring-country shocks raise perceptions of wage fairness for low earners and increase perceived fairness toward high-status groups, patterns opposite of those found in the domestic analysis, where scarcity-driven fairness consistently weakens following direct exposure. At the same time, cross-border shocks also reduce the perceived fairness of the political system, indicating that external disasters can heighten institutional skepticism even as they strengthen other fairness domains.

Overall, the key takeaway is that cross-border disaster shocks produce a systematically more positive and solidarity-oriented response than domestic disasters, but with persistent concerns about political-system fairness. This divergence underscores that individuals respond differently to external versus internal shocks: domestic disasters activate scarcity and self-protection concerns, whereas disasters in neighboring countries trigger empathy, regional awareness, and institutional comparison effects. As a result, fairness norms are shaped not only by what happens within a country, but also by the broader environmental conditions unfolding just beyond its borders.

7 Mechanisms

In this sections we aspire to analytically study potential mechanisms that can shape how natural disasters influence (in a positive or negative way) individuals' fairness attitudes. The underlying idea is that disaster shocks do not operate in isolation. Instead, their effects are filtered through the trust of individuals in public institutions and ultimately via broader economic conditions. In order to be able to econometric ally capture these channels, we interact our disaster shock variable with various dimensions of institutional trust (i.e., trust in parliament, political parties, politicians, the EU Parliament, the legal system, and the police) , as well as with key economic indicators (i.e., foreign direct investment, EU funds, trade, gross domestic product (GDP) growth, and income). These interactions hint to us that exposure to a disaster can amplify or dampen fairness perceptions in a differential way in contexts where institutions are more trusted, where public resources are more abundant, or where economic integration is deeper. We can thus assess whether institutional credibility and economic capacity condition the ways in which individuals interpret fairness norms following a disaster shock.

The existing research highlights the significant relationship between natural disaster shocks and trust in institutions, which can significantly influence fairness norms. (Kahn, 2005; Choong et al., 2025). Moreover, it hints to the fact that EU funds may has a significant effect on the interplay between disaster shocks and fairness norms. Recent European reforms have expanded both the scope and resources of EU funding (Hodson, 2012). This has enabled the European Union to mobilize necessary resources to respond to unforeseen events. This is not only a useful tools to address natural disasters (Hochrainer-Stigler et al., 2022) but is also essential for social

cohesion and EU solidarity. Another element that could affect our results, as previous studies have highlighted, is foreign direct investment via its impact on natural disaster shocks and fairness perceptions (Escaleras and Register, 2011; Chilton et al., 2020). It can also operate via the relationship between trade flows and their influence on both natural disasters and fairness norms (Gassebner et al., 2010; Brutger and Rathbun, 2021). Last, a factor that is always important in several different contexts is gross domestic product (GDP) growth. The latter is closely associated with fairness and disaster shocks, as demonstrated by previous studies (Felbermayr and Gröschl, 2014; Alesina and La Ferrara, 2005) , while income significantly shapes both disaster impacts and fairness perceptions (Warr and Aung, 2019; Köchling et al., 2025).

We collect data on trust in institutions from the European Social Survey (ESS), and data on gross domestic product (GDP), income, foreign direct investment, and trade from the World Bank. Regional GDP and income data come from Eurostat, while data on regional funds are drawn from the Cohesion Open Data platform under the heading 'Historic EU Payments - Regionalized and Modeled.

7.1 Trust in Institutions

Table 6 examines how trust in a country's parliament influences the relationship between disaster exposure and fairness perceptions. The interaction term shows limited influence across most fairness dimensions. Trust in parliament does not significantly moderate the effect of disaster shocks on beliefs about wage fairness for the bottom 10%, the fairness of the political system, perceptions of one's own pay, societal support, fairness toward elites, rewards for effort, or police treatment by gender. However, trust in parliament does strengthen the belief that access to education is

becoming fairer following a disaster shock, and it weakens the perception that medical services treat men and women equally. Both of these relationships are statistically significant, indicating that institutional trust matters selectively-shaping responses in domains tied to opportunity and public service provision, but leaving most other fairness perceptions unaffected.

[INSERT TABLE 6 HERE]

Table 7 shows how trust in political parties conditions the relationship between disaster shocks and fairness perceptions. The results indicate that trust in political parties does not meaningfully alter most fairness attitudes following a disaster shock. Columns (1), (3), (4), (5), (7), and (8) all show no statistically significant interaction effects, suggesting that trust in political parties does not shape perceptions of wage fairness for low earners, the fairness of the political system, perceptions of unfair pay, societal support, fairness favoring elites, or fair reward for effort in the wake of a disaster.

There are, however, two exceptions. Column (2) shows that higher trust in political parties is associated with more positive perceptions of fairness in access to education after a disaster shock. Conversely, Column (9) indicates that greater trust in political parties corresponds to a less favorable view of gender equality in medical treatment when a disaster occurs. These patterns suggest that while trust in political parties has limited moderating influence overall, it can affect specific domains of fairness linked to educational opportunity and institutional gender treatment.

[INSERT TABLE 7 HERE]

Table 8 examines how trust in politicians affects the relationship between disaster exposure and fairness perceptions. Across Columns (1) to (8), the interaction term shows no statistically significant association with fairness outcomes, indicating that trust in politicians does not meaningfully

moderate individuals' views about wage fairness for the bottom 10% of earners, educational opportunity, the fairness of the political system, perceptions of gross pay, societal support, elite favoritism, effort-based rewards, or gender fairness in policing. In contrast, Column (9) shows that higher trust in politicians is associated with a reduction in the likelihood of perceiving medical services as gender-equal following a disaster shock, with this negative relationship statistically significant at conventional levels. Overall, trust in politicians appears to have a limited moderating role, with effects emerging only in perceptions related to gender fairness in healthcare.

[INSERT TABLE 8 HERE]

In Table 9, we examine how trust in the EU Parliament influences the relationship between disaster exposure and fairness perceptions. Column (1) indicates that, when individuals have higher trust in the EU Parliament, disaster shocks are associated with a less favorable view of wage fairness for the bottom 10% of earners. Columns (2) through (5) show no meaningful association between trust in the EU Parliament and disaster exposure for perceptions of educational fairness, political fairness, the fairness of one's own pay, or the view that society provides support to those in need. Column (6) suggests that greater trust in the EU Parliament is linked to a more critical assessment of whether society treats high-status groups fairly following a disaster shock. Finally, Columns (7) to (9) show no evidence that trust in the EU Parliament moderates perceptions of fair rewards for effort, fairness in policing by gender, or fairness in medical treatment by gender.

[INSERT TABLE 9 HERE]

Table 10 examines how trust in the legal system shapes individuals' attitudes toward fairness following a disaster shock. Column 1 shows that higher trust in the legal system is associated with

a lower likelihood of perceiving improvements in wage fairness for the bottom 10% of employees, although this relationship is not statistically significant. Column 2 indicates that greater trust in the legal system is linked to a higher likelihood of viewing access to education as fairer, with the effect significant at the 10% level. Columns 3 through 7 suggest no statistically significant relationship between trust in the legal system and perceptions of fairness across several domains, including the political system, unfair gross pay, societal support, favoritism toward elites, and rewards for effort. Finally, Columns 8 and 9 show that higher trust in the legal system is associated with lower perceptions of gender-neutral treatment by the police and of equal medical treatment across genders, with these effects significant at the 10% and 1% levels, respectively.

[INSERT TABLE 10 HERE]

Table 11 examines how trust in the police affects the relationship between disaster exposure and fairness perceptions. Across Columns 1 to 8, higher trust in the police does not significantly shape individuals' attitudes toward fairness in areas such as wage fairness for the bottom 10% of earners, educational opportunity, the fairness of the political system, perceptions of gross pay, societal support, fairness toward elites, or whether effort is rewarded fairly. These estimates suggest that, for most fairness dimensions, trust in the police does not alter how individuals respond to natural disaster shocks. In contrast, Column 9 shows that trust in the police is associated with a lower likelihood of perceiving that medical services treat men and women equally when interacted with disaster exposure, and this effect is statistically significant at the 10% level.

[INSERT TABLE 11 HERE]

7.2 EU Funds

Table 12 examines how EU funds shapes the relationship between disaster exposure and fairness perceptions. Columns (1)-(3) show that interacting EU fund allocations with disaster shocks does not significantly influence views on the fairness of earnings for the bottom 10% of employees, perceptions of educational fairness, or fairness in the political system. In contrast, Columns (4) and (5) indicate that higher EU fund exposure is associated with less favorable views regarding societal support and individuals' perceptions of their own pay, suggesting that EU funding may heighten concerns about distributive fairness following disaster shocks. Finally, Columns (6) and (7) show no significant effects on perceptions of whether society favors elites or whether effort is fairly rewarded.

[INSERT TABLE 12 HERE]

7.3 Gross Domestic Product

Table 13 explores how gross domestic product (GDP) influences individuals' perceptions of fairness following a natural disaster shock. Across Columns 1 to 7, the interaction between disaster exposure and GDP does not meaningfully alter fairness attitudes. Specifically, higher GDP does not shape views regarding wage fairness for the bottom 10% of earners, equality of educational opportunity, perceptions of a fair political system, assessments of whether one's own pay is unfair, whether society provides support to those in need, whether society favors elites, or whether effort is rewarded fairly. Taken together, the results indicate that GDP does not systematically moderate the relationship between disaster exposure and fairness norms.

[INSERT TABLE 13 HERE]

In Table 14, we show how gross domestic product at the NUTS 1 regional level affects individuals' attitudes toward fairness following a natural disaster shock. Column 1 suggests that a one-unit increase in regional gross domestic product is associated with a 14.2 percentage point decrease in the likelihood of perceiving that fairness for the bottom 10% of employees is improving in terms of wages, statistically significant at the 1% level. Columns 2 and 3 show that higher gross domestic product has no significant impact on individuals' attitudes toward fairness, including the fairness of the education level and political system. In Column 4, a one-unit increase in gross domestic product decreases individuals' perceptions that their own pay is unfair by 14.7 percentage points. The result is significant at the 10% level. Finally, Columns 5 to 7 reveal that higher gross domestic product does not influence individuals' attitudes toward fairness in terms of whether society aids all, whether society favors elites, or whether society rewards effort, as none of these show significant effects.

These findings suggest that regional economic conditions may shape how individuals interpret the consequences of natural disasters, but only for a narrow set of outcomes. Higher-income regions may feel less wage pressure after a shock-reflected in lower concerns about unfair pay-yet this does not extend to broader fairness perceptions such as opportunity, institutional fairness, or societal support. In other words, wealthier regions adjust fairness judgments at the margin, but economic prosperity does not fundamentally alter how people evaluate most fairness norms in the aftermath of a disaster.

[INSERT TABLE 14 HERE]

7.4 Income

Table 15 examines how income (annual % growth) affects the relationship between natural disaster shocks and individuals' fairness perceptions. Columns 1 to 6 show no significant interaction effects: higher income does not meaningfully shape attitudes toward wage fairness for the bottom 10% of earners, fairness in education, fairness in the political system, perceptions of unfair gross pay, beliefs that society aids all, or views on whether society favors elites. By contrast, Column 7 indicates that higher income is associated with a reduced likelihood of perceiving that effort is rewarded fairly, a result that is statistically significant at the 5% level. This suggests that income growth does little to influence most fairness domains in the aftermath of disasters, but it is linked to more skeptical views regarding whether personal effort is fairly compensated.

[INSERT TABLE 15 HERE]

In Table 16, we show how disposable income at the Nuts 1 regional level and the experience of a natural disaster shock affect individuals' attitudes toward fairness. Column 1 shows that a one-unit increase in income is associated with an 18.5 percentage point decrease in the likelihood of perceiving that fairness for the bottom 10% of employees is improving in terms of wages. This result is significant at the 10% level. Columns 2 and 3 suggest that higher income does not impact individuals' attitudes toward fairness in areas such as fair education or a fair political system, all of which show no significant impact. In Columns 4 and 5, a one-unit increase in income increases individuals' perceptions that their pay is not unfairly low and that society is providing support to everyone. These results are significant at the 10% and 1% levels, respectively. Column 6 indicates that higher income decreases individuals' perception that society is fair and does not favor elites,

with significance at the 5% level. Finally, Column 9 shows that higher income does not influence individuals' attitudes toward whether effort is rewarded fairly.

[INSERT TABLE 16 HERE]

7.5 Foreign Direct Investment

Table 17 presents how foreign direct investment (FDI) interacts with natural disaster shocks to shape individuals' fairness perceptions. Columns 1 to 3 indicate that FDI does not significantly influence attitudes related to fairness for the bottom 10% of earners, fairness in education, or fairness in the political system. Column 4 shows that higher FDI is associated with a lower likelihood of perceiving one's own pay as unfair, suggesting that greater economic openness may temper concerns about personal earnings fairness. Columns 5 and 6 show no significant relationship between FDI and perceptions that society aids all or that society treats high-status groups fairly. In Column 7, however, higher FDI is linked to a reduced likelihood of believing that effort is rewarded fairly, a result that is statistically significant.

Taken together, these findings suggest that while FDI does not broadly shift fairness norms after disasters, it does shape perceptions in domains tied to labor markets and economic competition. Greater foreign investment may create expectations of efficiency or market-driven outcomes, which could partially explain why perceptions of unfair pay decrease, yet beliefs about fair rewards for effort become more critical.

[INSERT TABLE 17 HERE]

7.6 Trade

In Table 18, we examine how trade openness interacts with natural disaster exposure to shape individuals' fairness perceptions. Column 1 shows that greater trade does not meaningfully alter views about wage fairness among the bottom 10% of earners. Column 2 suggests a slight decline in perceived fairness in access to education, though the effect is not statistically significant. Columns 3 to 7 indicate that higher trade levels are not associated with changes in attitudes regarding various aspects of fairness (i.e.,the political system, gross pay, societal support, elite favoritism, or the fairness of rewards for effort). These findings suggest that trade flows do not have a systematic effect on how individuals update their fairness norms after a disaster shock. This suggests that economic openness, unlike institutional trust or income dynamics, plays a limited role in shaping fairness perceptions in the aftermath of environmental shocks.

[INSERT TABLE 18 HERE]

8 Concluding Remarks

In this paper we focus on a secondary effect of natural disasters. In the face of a natural disaster, societies experience immediate economic losses and severe damages. These acute consequences can lead to scarcity pressures which can ultimately reshape how individuals view and evaluate aspects of fairness and justice. We thus study, in a sample of European countries, how such an event can influence the perceptions of the public towards various aspects of fairness norms. In our analysis we distinguish between two types of fairness norms: i) solidarity-driven fairness, which reflects beliefs about mutual support, redistribution and the treatment of individuals from public

institutions; ii) scarcity driven fairness. The latter reflects the evaluation of fairness in the face of resource constraints (e.g., wage fairness, opportunities to education).

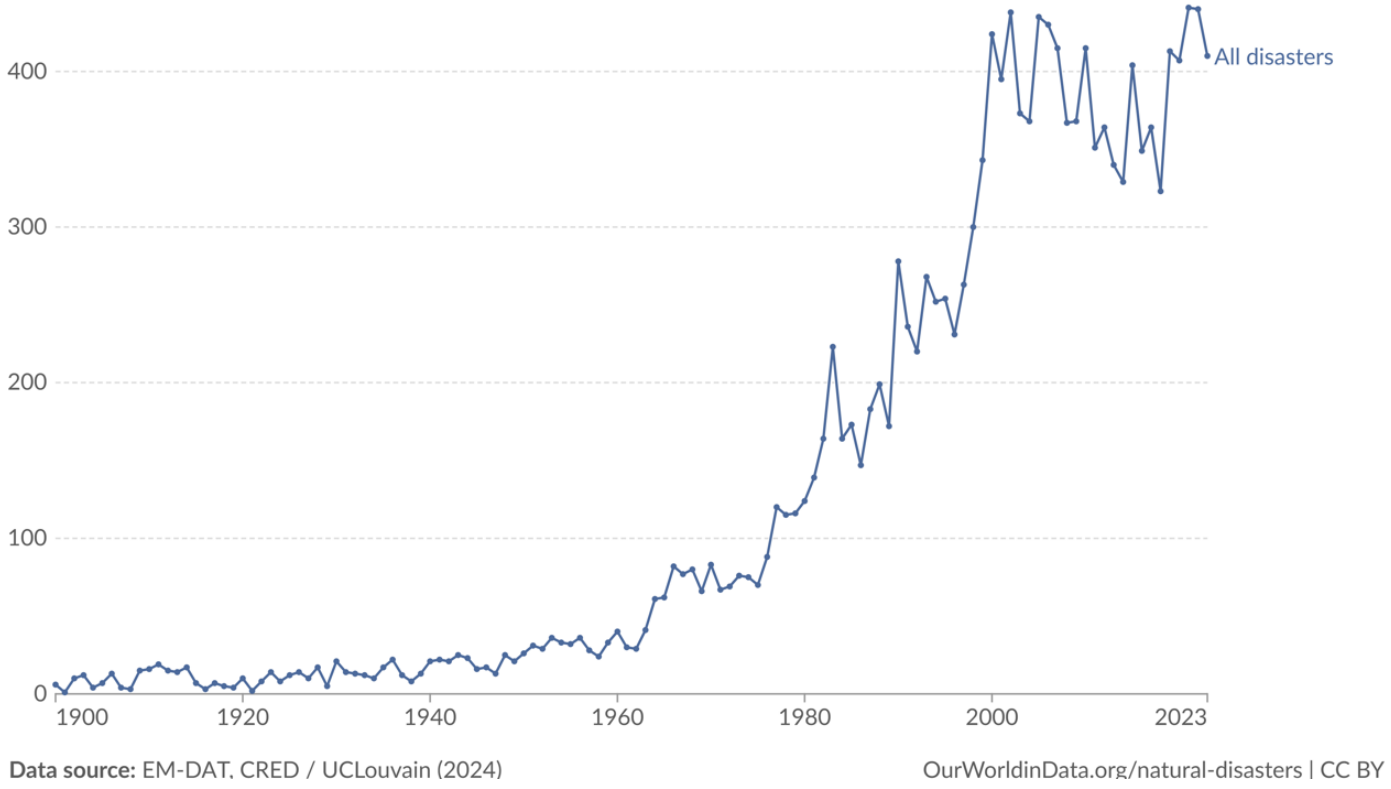
We implement two types of analysis. In the first, benchmark, analysis, we show can individuals respond when they are faced with a disaster. our findings suggest that direct exposure to a disaster can generate a dual effect. Concerning aspect of solidary-driven fairness, we observe that exposure to a disasters can raise fairness in social support, rewards for effort and views on equal treatment by medical and police services. On the other hand, we find that aspects of scarcity-driven fairness are lowered, i.e., perceptions about fairness in wages for low earners or access to education and the overall functioning of the political systems are weakened. Our findings thus suggest that when disasters hit a regions, several additional effects may arise which are not unidirectional.

The second type of our analysis factors in the fact that disasters have a cross-border nature as well and as such they can shape the perceptions of people living in neighboring countries. Indeed our finding suggest a statistically significant effect when we associate individuals with disasters experience in neighboring countries. The results still suggest a dual effect, i.e., we still observe that some norms become weaker and some stronger, however not all results are in the same direction as of that of the direct exposure. These patterns suggest that when disasters occur nearby but outside national borders, individuals react less to immediate scarcity pressures and more through mechanisms of regional comparison, empathy, and shared vulnerability.

We last study various channels via which our results may be reinforced or weakened. This hints to the scope of policy and suggests that policy makers should not only consider these second order effect but they should also be aware that understanding these channels is essential for designing equitable disaster-response policies and for anticipating how societies may re-evaluate fairness as environmental risks continue to intensify.

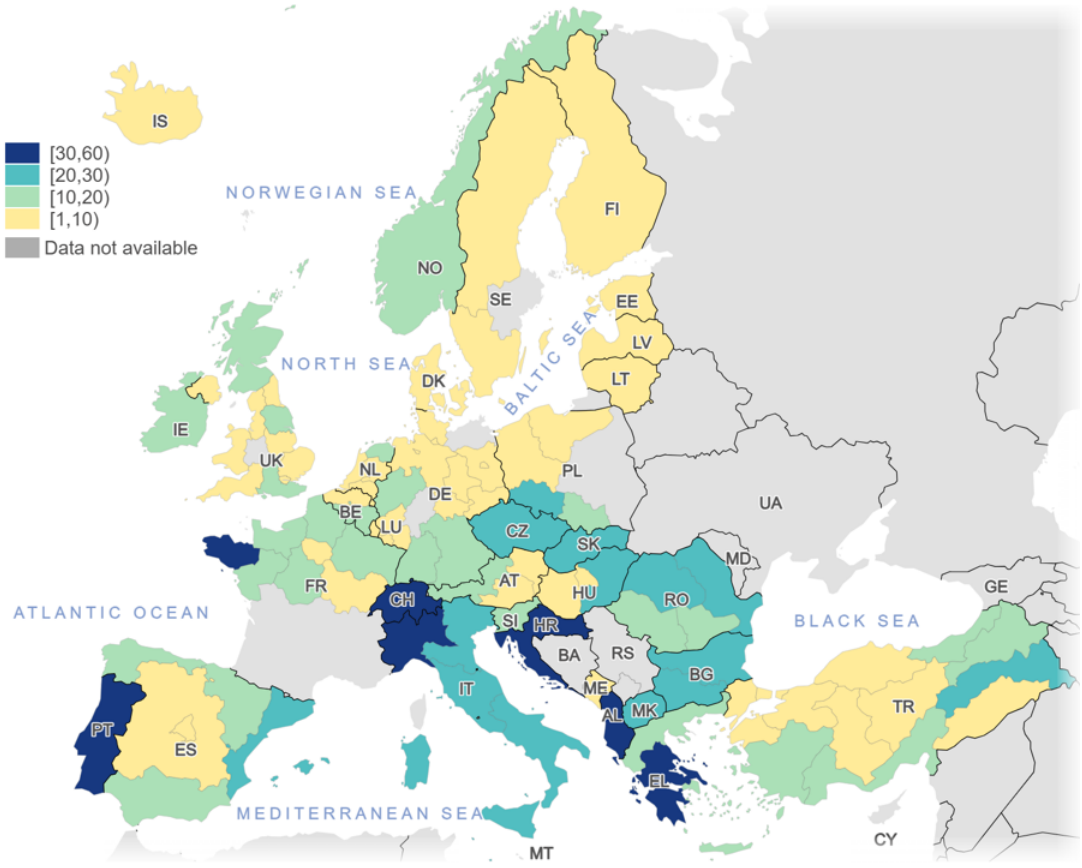
Main Tables and Figures

Figure 1: The Evolution of Natural Disasters



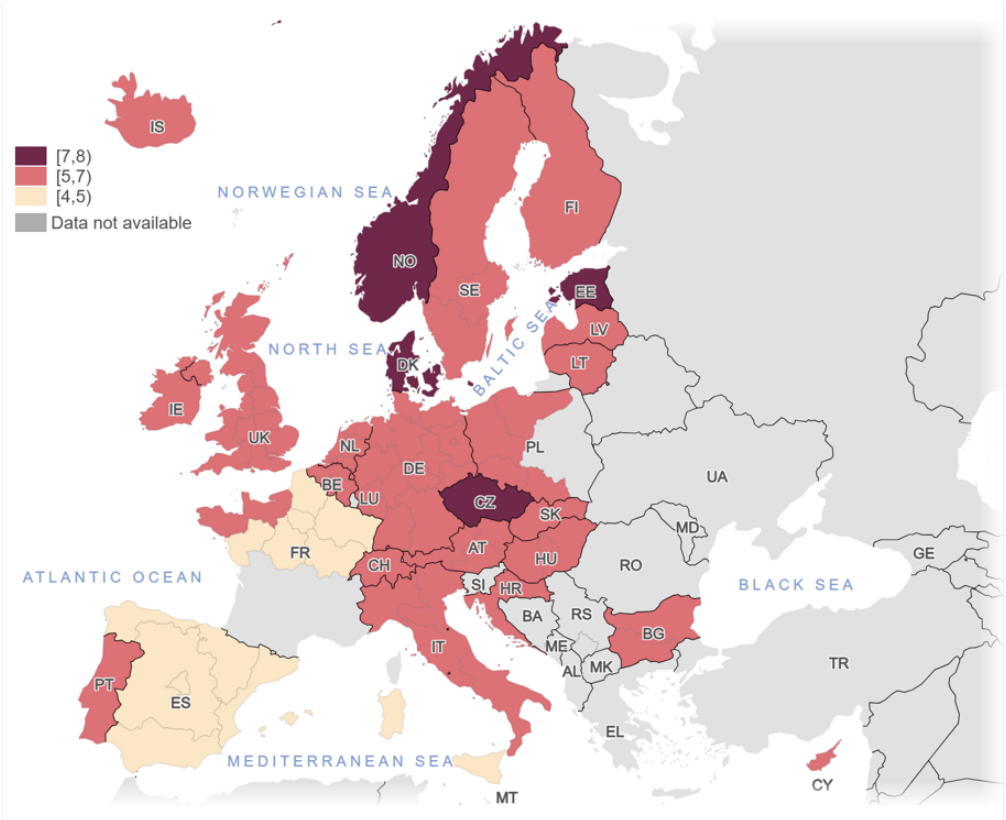
Notes: The map shows the number of recorded natural disasters worldwide from 1900 to 2023. The data source is EM-DAT, which provides regional-level information on significant disasters, including floods, storms, earthquakes, and wildfires.

Figure 2: Spatial Distribution of Natural Disasters



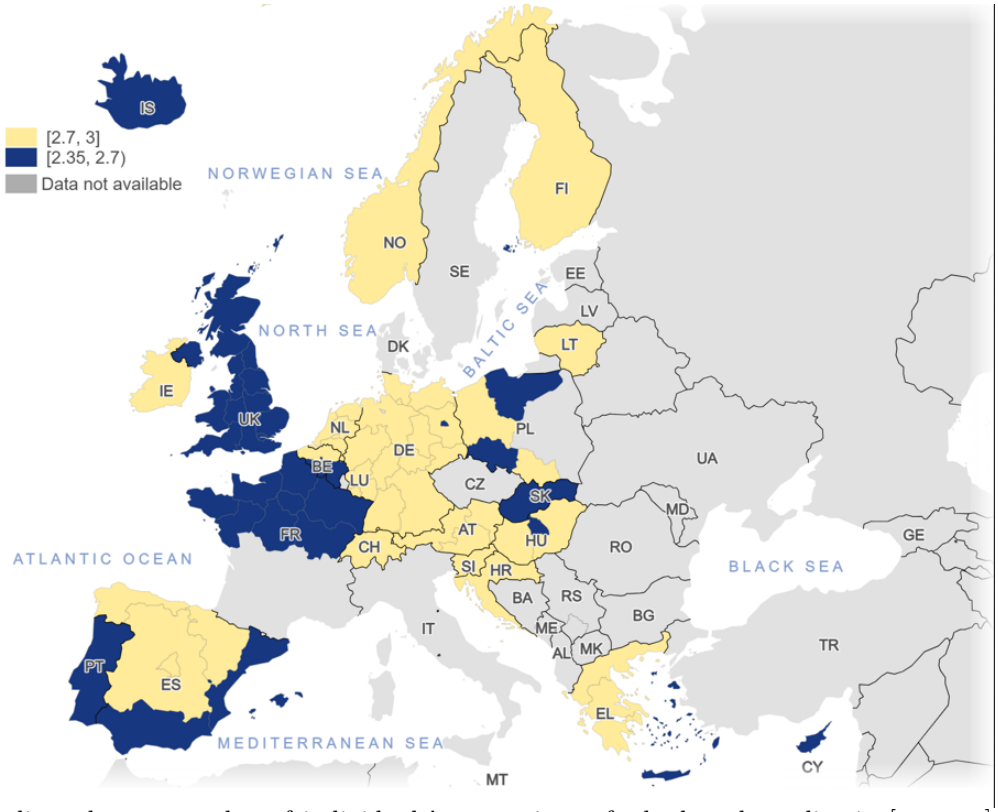
Notes: The map visualizes aggregated natural disaster shocks at the Nuts 1 level across European regions from 1974 to 2023. The data source is EM-DAT, which provides regional-level information on significant disasters, including floods, storms, earthquakes, and wildfires.

Figure 3: Everyone in country fair chance to achieve the level of education they seek



Notes: The map visualizes the mean value of individuals' perceptions of whether everyone in a country has a fair chance of achieving their desired level of education, at the Nuts1 1 level across European regions. The average is based on a scale from 0 = 'Does not apply at all' to 10 = 'Applies completely.' The data source is the European Social Survey, using the ESS Round 9

Figure 4: How fairly the police in country treat women and men.



Notes: The map visualizes the mean value of individuals' perceptions of whether the police in [country] treat women less fairly than men, treat men less fairly than women, or treat women and men equally fairly, at the Nuts 1 level across European regions. The average is based on a scale from 1 = 'The police treat women less fairly than men' to 3 = 'Women and men are treated equally fairly'. The data source is the European Social Survey, using the ESS Round 11

Figure 5: Descriptive Statistics (ESS)

	Obs.	Mean	SD	Min	Max
Fairness – ESS					
Fairness for bottom 10% earners	40.218	-2.32	1.71	-4	4
Fair education opportunity for all in [country]	41.306	6.19	2.50	0	10
Fair political participation in [country]	40.244	2.72	1.04	1	5
Is your pay unfairly low, fair, or high?	22.202	-0.95	1.36	-4	4
Fair society aids the needy unconditionally	41.538	2.14	0.88	1	5
Fair society favors high-status families	40.912	3.77	1.04	1	5
Fair society rewards hard work	41.652	2.03	0.83	1	5
Gender fairness by police in [country]	30.365	2.73	0.58	1	3
Gender fairness in healthcare in [country]	32.296	2.69	0.68	1	3
Disaster Variables					
Natural Disaster Shock	76.027	0.88	0.31	0	1
Overall Exposure	76.027	7.40	5.27	0	23
At least one Neighbor	76.027	0.93	0.23	0	1
Demographic Variables					
Age	75.621	52.0	18.0	18	90
Education	76.027	15.1	8.41	2	28
Marital Status	76.027	7.09	2.61	1	10
Number of people in household	75.826	2.49	1.29	0	13
Gender	76.027	1.53	0.49	1	2

Notes: EM-DAT and European Social Survey (ESS). The table presents descriptive statistics for fairness measures, including the bottom 10% of full-time employees in the country earning less than [amount], as well as perceptions of fairness in society. These measures cover the perceived fairness of opportunities for individuals in the country to achieve the level of education they seek, the fairness of the political system in ensuring equal participation in politics, and perceptions of whether one's gross pay is unfairly low, fair, or unfairly high. It also includes measures of how fair society is in taking care of the poor and those in need, regardless of what they give back, and the perceived fairness of society when individuals from families with high social status enjoy privileges. Additional fairness measures assess whether society is seen as fair when hard-working individuals earn more than others and how fairly the police treat women/men in [country]. There are also perceptions of whether women/men are treated equally fairly when seeking medical treatment in [country]. The table further includes descriptive statistics for natural disaster shocks, based on the Natural Disaster Shock variable. This includes individuals who have experienced a natural disaster shock as well as those who have been impacted by disaster shocks in neighboring countries. Finally, the table also includes demographic characteristics such as age, gender, education (measured by the International Standard Classification of Education, ISCED), marital status, and the number of people regularly living in the household.

Table 1: Disaster Shock and Solidarity-Driven Fairness

	(1) Society aids all	(2) Fair rewards effort	(3) Fairness of police by gender	(4) Equal medical treatment by gender
Disaster Shock	-0.122 ***	-0.181 ***	0.841 ***	1.202 ***
	(-6.90)	(-3.00)	(53.1)	(49.8)
Sample	41.275	41.387	30.132	32.034
Controls	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
Nuts 1 FE	✓	✓	✓	✓

Notes: Coefficients for all dummy variables are not reported. This table shows the positive impact of experiencing a natural disaster shock on perceptions of fairness, including the extent to which society aids all, whether effort is rewarded fairly, the fairness of police by gender, equal medical treatment by gender, while controlling for individual characteristics such as age, gender, education, marital status, and household size. The model also includes year and Nuts 1 fixed effects. Standard errors, clustered at the Nuts 1 level, are shown in parentheses, and statistical significance is indicated as follows: *** p < 0.01, ** p < 0.05, * p < 0.10.

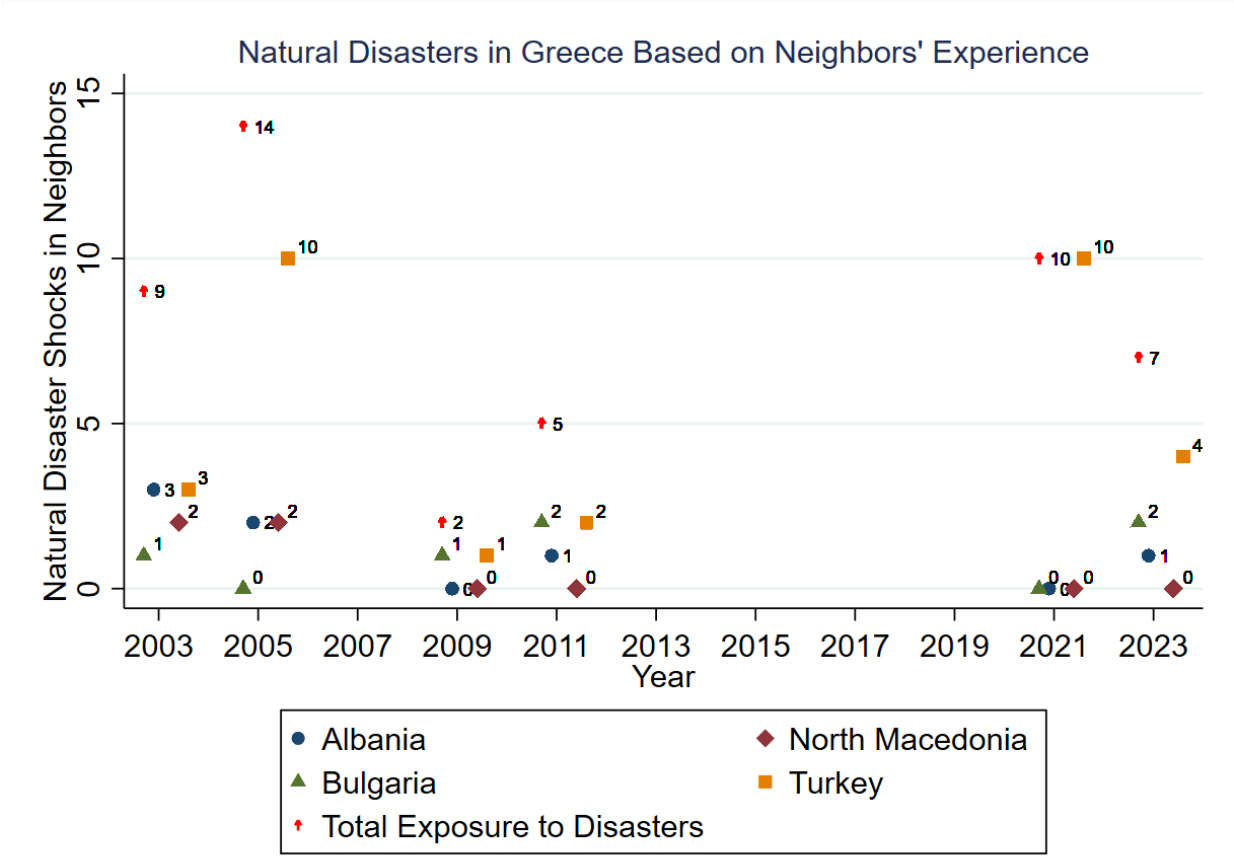
Table 2: Disaster Shock and Scarcity-Driven Fairness

	(1) Bottom 10% earners' fairness	(2) Your gross pay is unfair	(3) Fair education level
Disaster Shock	0.160 ***	0.132 **	-0.174 ***
	(8.20)	(2.30)	(-11.0)
Sample	39.974	22.095	41.047
Controls	✓	✓	✓
Year FE	✓	✓	✓
Nuts 1 FE	✓	✓	✓

	(4) Fair political system	(5) Fair society favors elites
Disaster Shock	-0.040 ***	0.173 ***
	(-3.90)	(6.20)
Sample	39.986	40.651
Controls	✓	✓
Year FE	✓	✓
Nuts 1 FE	✓	✓

Notes: Coefficients for all dummy variables are not reported. This table shows the negative impact of experiencing a natural disaster shock on perceptions of fairness, including the fairness of earnings for the bottom 10% of earners, perceptions of gross pay, fair education levels, the fairness of the political system, and whether society favors elites, while controlling for individual characteristics such as age, gender, education, marital status, and household size. The model also includes year and Nuts 1 fixed effects. Standard errors, clustered at the NUTS 1 level, are shown in parentheses, and statistical significance is indicated as follows: *** p < 0.01, ** p < 0.05, * p < 0.10.

Figure 6: Natural Disasters in Greece Based on Neighbors' Experience



Notes: The graph presents the natural disaster shocks in Greece in relation to the experiences of its neighboring countries - Albania, North Macedonia, Bulgaria, and Turkey -over the period from 2003 to 2023. It also shows the overall exposure of these neighboring countries to disaster shocks during the same years.

Table 3: Neighborhood Disaster Shock and Fairness Norms (Raising Fairness)

	(1) Fair rewards effort	(2) Society aids all	(3) Fairness of police by gender	(4) Equal medical treatment by gender
Bordering Shock	-0.557 ***	-0.159 ***	0.267 ***	0.950 ***
	(-26.7)	(-12.6)	(14.6)	(33.8)
Sample	41.387	41.275	30.132	32.034
Controls	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
Country FE	✓	✓	✓	✓

	(5) Fair society favors elites	(6) Bottom 10% earners' fairness
Bordering Shock	-0.478 ***	-1.036 ***
	(-24.8)	(-35.7)
Sample	40.651	39.974
Controls	✓	✓
Year FE	✓	✓
Country FE	✓	✓

Notes: Coefficients for all dummy variables are not reported. This table shows the positive impact of neighbors experiencing a natural disaster shock on perceptions of fairness, including society aiding all, whether effort is rewarded fairly, the fairness of police by gender, equal medical treatment by gender, whether society favors elites, and the fairness of earnings for the bottom 10% of earners, while controlling for individual characteristics such as age, gender, education, marital status, and household size. The model also includes year and country fixed effects. Standard errors, clustered at the country level, are shown in parentheses, and statistical significance is indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 4: Neighborhood Disaster Shock and Fairness Norms (Reduced Fairness)

	(1) Fair political system
Bordering Shock	-0.521 ***
	(-27.2)
Sample	39.986
Controls	✓
Year FE	✓
Country FE	✓

Notes: Coefficients for all dummy variables are not reported. This table shows the negative impact of neighbors experiencing a natural disaster shock on perceptions of fairness, including the fairness of the political system, while controlling for individual characteristics such as age, gender, education, marital status, and household size. The model also includes year and country fixed effects. Standard errors, clustered at the country level, are shown in parentheses, and statistical significance is indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 5: Neighborhood Overall Disaster Exposure and Fairness Norms (Increasing Fairness)

	(1) Fairness of police by gender	(2) Equal medical treatment by gender	(3) Your gross pay is unfair
Total Bordering Shock	0.050 ***	0.047 ***	-0.010*
	(46.2)	(30.5)	(-1.68)
Sample	30.132	32.034	22.095
Controls	✓	✓	✓
Year FE	✓	✓	✓
Country FE	✓	✓	✓

Notes: Coefficients for all dummy variables are not reported. This table shows the positive impact of neighbors experiencing a natural disaster shock on perceptions of fairness, including the fairness of police by gender, equal medical treatment by gender, whether your gross pay is unfair while controlling for individual characteristics such as age, gender, education, marital status, and household size. The model also includes year and country fixed effects. Standard errors, clustered at the country level, are shown in parentheses, and statistical significance is indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 6: Trust in Parliament

	(1) Bottom 10% earners' fairness	(2) Fair education level	(3) Fair political system	(4) Your gross pay is unfair
Disaster Shock x Trust in Parliament	0.012	0.022**	-0.004	0.000
	(1.51)	(2.48)	(-0.24)	(0.04)
Sample	39.299	40.350	39.502	21.757
Controls	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
Nuts 1 FE	✓	✓	✓	✓

	(5) Society aids all	(6) Fair society favors elites	(7) Fair rewards effort	(8) Fairness of police by gender	(9) Equal medical treatment by gender
Disaster Shock x Trust in Parliament	-0.002	0.015	-0.016	-0.007	-0.020*
	(-0.19)	(1.28)	(-1.32)	(-0.55)	(-1.91)
Sample	40.519	39.948	40.610	29.760	31.575
Controls	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
Nuts 1 FE	✓	✓	✓	✓	✓

*Notes: Coefficients for all dummy variables are not reported. This table shows the impact of experiencing a natural disaster shock on perceptions of fairness, including attitudes toward the fairness of earnings for the bottom 10% of earners, fair education levels, the fairness of the political system, perceptions of unfair gross pay, societal aid, fairness favoring elites, rewards for effort, fairness of police by gender, and equal medical treatment by gender, interacting with trust in the country's parliament, while controlling for individual characteristics such as age, gender, education, marital status, and household size. The model also includes year and Nuts 1 fixed effects. Standard errors, clustered at the Nuts 1 level, are shown in parentheses, and statistical significance is indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.*

Table 7: Trust in Political Parties

	(1) Bottom 10% earners' fairness	(2) Fair education level	(3) Fair political system	(4) Your gross pay is unfair
Disaster Shock x Political Parties	0.010	0.022**	-0.000	0.000
	(0.99)	(2.14)	(-0.01)	(0.06)
Sample	39.330	40.391	39.560	21.797
Controls	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
Nuts 1 FE	✓	✓	✓	✓

	(5) Society aids all	(6) Fair society favors elites	(7) Fair rewards effort	(8) Fairness of police by gender	(9) Equal medical treatment by gender
Disaster Shock x Political Parties	0.014	0.023**	- 0.007	-0.012	-0.038***
	(1.08)	(2.01)	(-0.64)	(-1.27)	(-2.90)
Sample	40.577	40.013	40.672	29.778	31.596
Controls	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
Nuts 1 FE	✓	✓	✓	✓	✓

*Notes: Coefficients for all dummy variables are not reported. This table shows the impact of experiencing a natural disaster shock on perceptions of fairness, including attitudes toward the fairness of earnings for the bottom 10% of earners, fair education levels, the fairness of the political system, perceptions of unfair gross pay, societal aid, fairness favoring elites, rewards for effort, fairness of police by gender, and equal medical treatment by gender, interacting with trust in political parties, while controlling for individual characteristics such as age, gender, education, marital status, and household size. The model also includes year and Nuts 1 fixed effects. Standard errors, clustered at the Nuts 1 level, are shown in parentheses, and statistical significance is indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.*

Table 8: Trust in Politicians

	(1) Bottom 10% earners' fairness	(2) Fair education level	(3) Fair political system	(4) Your gross pay is unfair
Disaster Shock x Trust in Politicians	0.012	0.015	-0.003	0.000
	(1.26)	(1.56)	(-0.25)	(0.07)
Sample	39.451	40.510	39.648	21.845
Controls	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
Nuts 1 FE	✓	✓	✓	✓

	(5) Society aids all	(6) Fair society favors elites	(7) Fair rewards effort	(8) Fairness of police by gender	(9) Equal medical treatment by gender
Disaster Shock x Trust in Politicians	0.016	0.017	0.000	-0.016	-0.035***
	(1.34)	(1.55)	(0.00)	(-1.06)	(-3.00)
Sample	40.695	40.123	40.790	29.850	31.686
Controls	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
Nuts 1 FE	✓	✓	✓	✓	✓

*Notes: Coefficients for all dummy variables are not reported. This table shows the impact of experiencing a natural disaster shock on perceptions of fairness, including attitudes toward the fairness of earnings for the bottom 10% of earners, fair education levels, the fairness of the political system, perceptions of unfair gross pay, societal aid, fairness favoring elites, rewards for effort, fairness of police by gender, and equal medical treatment by gender, interacting with trust in politicians, while controlling for individual characteristics such as age, gender, education, marital status, and household size. The model also includes year and Nuts 1 fixed effects. Standard errors, clustered at the Nuts 1 level, are shown in parentheses, and statistical significance is indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.*

Table 9: Trust in EU Parliament

	(1) Bottom 10% earners' fairness	(2) Fair education level	(3) Fair political system	(4) Your gross pay is unfair
Disaster Shock x Trust in EU Parliament	0.018*	0.020	0.013	-0.004
	(1.69)	(1.53)	(0.86)	(0.52)
Sample	37.309	38.331	37.663	20.891
Controls	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
Nuts 1 FE	✓	✓	✓	✓

	(5) Society aids all	(6) Fair society favors elites	(7) Fair rewards effort	(8) Fairness of police by gender	(9) Equal medical treatment by gender
Disaster Shock x Trust in EU Parliament	0.016	0.029*	-0.004	-0.007	-0.000
	(1.35)	(1.82)	(-0.43)	(-0.75)	(-0.06)
Sample	38.480	38.014	38.562	28.761	30.392
Controls	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
Nuts 1 FE	✓	✓	✓	✓	✓

*Notes: Coefficients for all dummy variables are not reported. This table shows the impact of experiencing a natural disaster shock on perceptions of fairness, including attitudes toward the fairness of earnings for the bottom 10% of earners, fair education levels, the fairness of the political system, perceptions of unfair gross pay, societal aid, fairness favoring elites, rewards for effort, fairness of police by gender, and equal medical treatment by gender, interacting with trust in EU Parliament, while controlling for individual characteristics such as age, gender, education, marital status, and household size. The model also includes year and Nuts 1 fixed effects. Standard errors, clustered at the Nuts 1 level, are shown in parentheses, and statistical significance is indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.*

Table 10: Trust in the Legal System

	(1) Bottom 10% earners' fairness	(2) Fair education level	(3) Fair political system	(4) Your gross pay is unfair
Disaster Shock x Trust in the Legal System	0.012	0.018*	-0.007	-0.004
	(1.09)	(2.25)	(-0.70)	(0.37)
Sample	39.370	40.449	39.536	21.858
Controls	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
Nuts 1 FE	✓	✓	✓	✓

	(5) Society aids all	(6) Fair society favors elites	(7) Fair rewards effort	(8) Fairness of police by gender	(9) Equal medical treatment by gender
Disaster Shock x Trust in the Legal System	-0.002	0.009	0.003	-0.024*	-0.029***
	(-0.16)	(0.85)	(0.43)	(-1.69)	(-2.78)
Sample	40.641	40.064	40.726	29.803	31.619
Controls	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
Nuts 1 FE	✓	✓	✓	✓	✓

*Notes: Coefficients for all dummy variables are not reported. This table shows the impact of experiencing a natural disaster shock on perceptions of fairness, including attitudes toward the fairness of earnings for the bottom 10% of earners, fair education levels, the fairness of the political system, perceptions of unfair gross pay, societal aid, fairness favoring elites, rewards for effort, fairness of police by gender, and equal medical treatment by gender, interacting with trust in the legal system, while controlling for individual characteristics such as age, gender, education, marital status, and household size. The model also includes year and Nuts 1 fixed effects. Standard errors, clustered at the Nuts 1 level, are shown in parentheses, and statistical significance is indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$*

Table 11: Trust in Police

	(1) Bottom 10% earners' fairness	(2) Fair education level	(3) Fair political system	(4) Your gross pay is unfair
Disaster Shock x Trust in Police	0.009	0.008	-0.013	0.015
	(1.02)	(0.71)	(-0.70)	(1.47)
Sample	39.782	40.844	39.842	22.027
Controls	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
Nuts 1 FE	✓	✓	✓	✓

	(5) Society aids all	(6) Fair society favors elites	(7) Fair rewards effort	(8) Fairness of police by gender	(9) Equal medical treatment by gender
Disaster Shock x Trust in Police	0.005	0.018	0.016	-0.027	-0.026*
	(0.49)	(1.40)	(1.66)	(-1.46)	(-1.85)
Sample	41.075	40.466	41.175	30.001	31.867
Controls	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
Nuts 1 FE	✓	✓	✓	✓	✓

*Notes:Coefficients for all dummy variables are not reported. This table shows the impact of experiencing a natural disaster shock on perceptions of fairness, including attitudes toward the fairness of earnings for the bottom 10% of earners, fair education levels, the fairness of the political system, perceptions of unfair gross pay, societal aid, fairness favoring elites, rewards for effort, fairness of police by gender, and equal medical treatment by gender, interacting with trust in police, while controlling for individual characteristics such as age, gender, education, marital status, and household size. The model also includes year and Nuts 1 fixed effects. Standard errors, clustered at the Nuts 1 level, are shown in parentheses, and statistical significance is indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.*

Table 12: EU funds

	(1) Bottom 10% earners' fairness	(2) Fair education level	(3) Fair political system	(4) Your gross pay is unfair
Disaster Shock x EU funds	0.086	0.075	0.048	1.043***
	(1.20)	(1.19)	(0.28)	(2.89)
Sample	36.495	37.533	36.550	19.524
Controls	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
Nuts 1 FE	✓	✓	✓	✓

	(5) Society aids all	(6) Fair society favors elites	(7) Fair rewards effort
Disaster Shock x EU funds	0.316***	-0.286	0.306
	(3.52)	(-1.16)	(1.52)
Sample	37.705	37.106	37.824
Controls	✓	✓	✓
Year FE	✓	✓	✓
Nuts 1 FE	✓	✓	✓

*Notes: Coefficients for all dummy variables are not reported. This table shows the impact of experiencing a natural disaster shock on perceptions of fairness, including attitudes toward the fairness of earnings for the bottom 10% of earners, fair education levels, the fairness of the political system, perceptions of unfair gross pay, society aiding all, fairness favoring elites, fair rewards for effort, interacting with EU funds, while controlling for individual characteristics such as age, gender, education, marital status, and household size. The model also includes year and Nuts 1 fixed effects. Standard errors, clustered at the Nuts 1 level, are shown in parentheses, and statistical significance is indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.*

Table 13: Gross Domestic Prodcut Country

	(1) Bottom 10% earners' fairness	(2) Fair education level	(3) Fair political system	(4) Your gross pay is unfair
Disaster Shock x GDP	-0.038	-0.147	0.082	-0.271
	(-0.20)	(-0.6)	(0.8)	(-0.80)
Sample	39.974	41.047	39.986	22.095
Controls	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
Nuts 1 FE	✓	✓	✓	✓

	(5) Society aids all	(6) Fair society favors elites	(7) Fair rewards effort
Disaster Shock x GDP	-0.088	0.001	-0.230
	(-0.8)	(0.00)	(-0.80)
Sample	41.275	40.651	41.387
Controls	✓	✓	✓
Year FE	✓	✓	✓
Nuts 1 FE	✓	✓	✓

*Notes: Coefficients for all dummy variables are not reported. This table shows the impact of experiencing a natural disaster shock on perceptions of fairness, including attitudes toward the fairness of earnings for the bottom 10% of earners, fair education levels, the fairness of the political system, perceptions of unfair gross pay, society aiding all, fairness favoring elites, fair rewards for effort, interacting with GDP at the country level, while controlling for individual characteristics such as age, gender, education, marital status, and household size. The model also includes year and Nuts 1 fixed effects. Standard errors, clustered at the Nuts 1 level, are shown in parentheses, and statistical significance is indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.*

Table 14: Gross Domestic Prodcut Regional

	(1) Bottom 10% earners' fairness	(2) Fair education level	(3) Fair political system	(4) Your gross pay is unfair
Disaster Shock x GDP_Reg	0.142**	0.203	0.167	-0.147**
	(2.36)	(1.20)	(1.36)	(-2.20)
Sample	29.103	29.882	29.039	15.585
Controls	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
Nuts 1 FE	✓	✓	✓	✓

	(5) Society aids all	(6) Fair society favors elites	(7) Fair rewards effort
Disaster Shock x GDP_Reg	-0.154	0.236	-0.181
	(-0.60)	(0.60)	(-0.61)
Sample	29.955	29.441	30.069
Controls	✓	✓	✓
Year FE	✓	✓	✓
Nuts 1 FE	✓	✓	✓

*Notes: Coefficients for all dummy variables are not reported. This table shows the impact of experiencing a natural disaster shock on perceptions of fairness, including attitudes toward the fairness of earnings for the bottom 10% of earners, fair education levels, the fairness of the political system, perceptions of unfair gross pay, society aiding all, fairness favoring elites, fair rewards for effort, interacting with GDP at the regional level, while controlling for individual characteristics such as age, gender, education, marital status, and household size. The model also includes year and Nuts 1 fixed effects. Standard errors, clustered at the Nuts 1 level, are shown in parentheses, and statistical significance is indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.*

Table 15: Income Country

	(1) Bottom 10% earners' fairness	(2) Fair education level	(3) Fair political system	(4) Your gross pay is unfair
Disaster Shock x Income	-0.045	0.018	-0.017	0.054
	(-0.82)	(0.3)	(-0.24)	(0.3)
Sample	37.166	38.198	37.220	20.169
Controls	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
Nuts 1 FE	✓	✓	✓	✓

	(5) Society aids all	(6) Fair society favors elites	(7) Fair rewards effort
Disaster Shock x Income	0.061	-0.125	0.213**
	(0.8)	(-1.20)	(2.16)
Sample	38.381	37.786	38.498
Controls	✓	✓	✓
Year FE	✓	✓	✓
Nuts 1 FE	✓	✓	✓

*Notes: Coefficients for all dummy variables are not reported. This table shows the impact of experiencing a natural disaster shock on perceptions of fairness, including attitudes toward the fairness of earnings for the bottom 10% of earners, fair education levels, the fairness of the political system, perceptions of unfair gross pay, society aiding all, fairness favoring elites, fair rewards for effort, the fairness of votes being counted, and taxing the rich to aid the poor, interacting with income (annual growth) at the country level, while controlling for individual characteristics such as age, gender, education, marital status, and household size. The model also includes year and Nuts 1 fixed effects. Standard errors, clustered at the Nuts 1 level, are shown in parentheses, and statistical significance is indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.*

Table 16: Income Regional

	(1) Bottom 10% earners' fairness	(2) Fair education level	(3) Fair political system	(4) Your gross pay is unfair
Disaster Shock x Income_Reg	0.185*	0.264	0.241	-0.263*
	(1.88)	(1.10)	(1.60)	(-1.70)
Sample	29.103	29.882	29.039	15.585
Controls	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
Nuts 1 FE	✓	✓	✓	✓

	(5) Society aids all	(6) Fair society favors elites	(7) Fair rewards effort
Disaster Shock x Income_Reg	-0.689***	0.987**	-0.681
	(-3.10)	(2.20)	(-1.30)
Sample	29.955	29.441	30.069
Controls	✓	✓	✓
Year FE	✓	✓	✓
Nuts 1 FE	✓	✓	✓

*Notes:Coefficients for all dummy variables are not reported. This table shows the impact of experiencing a natural disaster shock on perceptions of fairness, including attitudes toward the fairness of earnings for the bottom 10% of earners, fair education levels, the fairness of the political system, perceptions of unfair gross pay, society aiding all, fairness favoring elites, fair rewards for effort, interacting with income at the regional level, while controlling for individual characteristics such as age, gender, education, marital status, and household size. The model also includes year and Nuts 1 fixed effects. Standard errors, clustered at the Nuts 1 level, are shown in parentheses, and statistical significance is indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.*

Table 17: Foreign Direct Investment

	(1) Bottom 10% earners' fairness	(2) Fair education level	(3) Fair political system	(4) Your gross pay is unfair
Disaster Shock x FDI	-0.002	0.000	-0.001	-0.004***
	(-1.53)	(0.02)	(-0.95)	(-3.65)
Sample	39.974	41.047	39.986	22.095
Controls	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
Nuts 1 FE	✓	✓	✓	✓

	(5) Society aids all	(6) Fair society favors elites	(7) Fair rewards effort
Disaster Shock x FDI	-0.000	-0.000	0.004***
	(-0.35)	(-0.22)	(2.51)
Sample	41.275	40.651	41.387
Controls	✓	✓	✓
Year FE	✓	✓	✓
Nuts 1 FE	✓	✓	✓

*Notes: Coefficients for all dummy variables are not reported. This table shows the impact of experiencing a natural disaster shock on perceptions of fairness, including attitudes toward the fairness of earnings for the bottom 10% of earners, fair education levels, the fairness of the political system, perceptions of unfair gross pay, society aiding all, fairness favoring elites, fair rewards for effort, interacting with foreign direct investment, while controlling for individual characteristics such as age, gender, education, marital status, and household size. The model also includes year and Nuts 1 fixed effects. Standard errors, clustered at the Nuts 1 level, are shown in parentheses, and statistical significance is indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.*

Table 18: Trade

	(1) Bottom 10% earners' fairness	(2) Fair education level	(3) Fair political system	(4) Your gross pay is unfair
Disaster Shock x Trade	0.000	-0.005	-0.003	-0.003
	(0.45)	(-1.60)	(-1.40)	(-0.40)
Sample	39.974	41.047	39.986	22.095
Controls	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
Nuts 1 FE	✓	✓	✓	✓

	(5) Society aids all	(6) Fair society favors elites	(7) Fair rewards effort
Disaster Shock x Trade	-0.002	-0.002	-0.000
	(-0.70)	(-1.00)	(-0.20)
Sample	41.275	40.651	41.387
Controls	✓	✓	✓
Year FE	✓	✓	✓
Nuts 1 FE	✓	✓	✓

*Notes: Coefficients for all dummy variables are not reported. This table shows the impact of experiencing a natural disaster shock on perceptions of fairness, including attitudes toward the fairness of earnings for the bottom 10% of earners, fair education levels, the fairness of the political system, perceptions of unfair gross pay, society aiding all, fairness favoring elites, fair rewards for effort, interacting with trade, while controlling for individual characteristics such as age, gender, education, marital status, and household size. The model also includes year and Nuts 1 fixed effects. Standard errors, clustered at the Nuts 1 level, are shown in parentheses, and statistical significance is indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.*

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Appendix

European Social Survey - Fairness Variables

- **Incomes of Bottom 10% of Employees**: Please think about the bottom 10% of employees working full-time in [country], earning less than [amount per month or per year]. In your opinion, are these incomes unfairly low, fair, or unfairly high?
  Scale: -4 = Low, extremely unfair, 0 = Fair, +4 = High, extremely unfair.
- **Fair Chance to Achieve Education**: Do you think that, overall, everyone in [country] has a fair chance of achieving the level of education they seek?
  Scale: 0 = Does not apply at all, 10 = Applies completely.
- **Fair Chance to Participate in Politics**: How much would you say that the political system in [country] ensures that everyone has a fair chance to participate in politics?
  Scale: 1 = Not at all, 5 = A great deal.
- **Fairness of Gross Pay**: Would you say your gross pay is unfairly low, fair, or unfairly high?
  Scale: -4 = Low, extremely unfair, 0 = Fair, +4 = High, extremely unfair.
- **Fairness in Society - Care for the Poor**: A society is fair when it takes care of those who are poor and in need, regardless of what they give back to society.
  Scale: 1 = Agree strongly, 5 = Disagree strongly.
- **Fairness in Society - Social Status Privileges**: A society is fair when people from families with high social status enjoy privileges in their lives.
  Scale: 1 = Agree strongly, 5 = Disagree strongly.
- **Fairness in Society - Hard-working People Earn More**: A society is fair when hard-working people earn more than others.
  Scale: 1 = Agree strongly, 5 = Disagree strongly.
- **Police Fairness - Gender Equality**: Would you say that the police in [country] treat women less fairly than men, treat men less fairly than women, or do they treat women and men equally fairly?
  Scale: 1 = The police treat women less fairly than men, 3 = Women and men are treated equally fairly.
- **Medical Treatment Fairness - Gender Equality**: Would you say that women and men are treated equally fairly or not when seeking medical treatment?
  Scale: 1 = The police treat women less fairly than men, 3 = Women and men are treated equally fairly.

European Social Survey - Trust Variables

- **Trust in Country's Parliament**: On a scale of 0-10, how much do you personally trust the country's parliament, where 0 means you do not trust it at all, and 10 means you have complete trust?
- **Trust in Legal System**: On a scale of 0-10, how much do you personally trust the legal system, where 0 means you do not trust it at all, and 10 means you have complete trust?

- **Trust in Police**: On a scale of 0-10, how much do you personally trust the police, where 0 means you do not trust them at all, and 10 means you have complete trust?
- **Trust in Politicians**: On a scale of 0-10, how much do you personally trust politicians, where 0 means you do not trust them at all, and 10 means you have complete trust?
- **Trust in Political Parties**: On a scale of 0-10, how much do you personally trust political parties, where 0 means you do not trust them at all, and 10 means you have complete trust?
- **Trust in European Parliament**: On a scale of 0-10, how much do you personally trust the European Parliament, where 0 means you do not trust it at all, and 10 means you have complete trust?

World Bank

- **Gross Domestic Product (GDP)**: At the country level.
- **Income (annual growth)** : At the country level.
- **Trade**: Trade is the sum of exports and imports of goods and services as a share of GDP (at the country level).
- **Foreign Direct Investment (FDI)**: The sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. This series shows net inflows (new investment inflows minus disinvestment) in the reporting economy from foreign investors, and is expressed as a percentage of GDP (at the country level).

Eurostat

- **Gross Domestic Product (GDP)**: At the regional Nuts-1 level.
- **Income (Disposable income of private households)**: At the regional Nuts-1 level.

Cohesion Open Data

- **EU Funds**: Annual EU grants received by Nuts-1 regions.