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Beyond Climate Risk: Measuring Climate Uncertainty and Its Macroeconomic and Financial Effects

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Abstract

We study the distributional dynamics of extreme weather in Europe and its macroeconomic and financial consequences, distinguishing climate risk from climate uncertainty. Using a balanced panel of forty European countries over 1981–2024 and the E3CI composite index and its seven hazard components, we condition the distribution of extreme weather on anthropogenic radiative forcing and natural climate oscillators, measuring climate risk by the conditional median and climate uncertainty by the conditional interquartile range. Both moments respond nonlinearly to greenhouse gas concentrations. Still, the contribution of natural forcing is asymmetric: climate risk reflects anthropogenic and natural drivers, whereas climate uncertainty is predominantly anthropogenic, with wildfires as the main exception. The post-2010 acceleration in warming is reflected in both moments, although with distinct spatial patterns. Both risk and uncertainty depress economic activity through a common productivity channel: real wages absorb most of the efficiency loss, consumption contracts by more than output, and labor utilization remains largely unchanged. Uncertainty effects are roughly twice as large as risk effects for a typical annual change, and their incidence is governed more by countries' absorptive capacity than by physical exposure, making climate change a source of economic divergence within Europe. In financial markets, climate exposures are concentrated in the uncertainty measures, with the value factor loading negatively on maximum-temperature and wildfire uncertainty and risk. Overall, the evidence is consistent with irreversibility and precautionary behavior as important mechanisms through which climate uncertainty affects macroeconomic activity and asset prices.

Keywords: climate change uncertainty; extreme weather; panel quantile regression; general-to-specific model selection; climate attribution; irreversibility; Fama-French factors; Europe

JEL classification: C23; C21; Q54; E32; G12

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1 Introduction

Recent evidence shows that global warming has accelerated markedly since 2010, running more than 50% above the roughly 0.18°C -per-decade pace of 1970-2010. The acceleration is statistically significant after 2015 and is likely driven by stronger warming from rising greenhouse gas (GHG) concentrations, increasingly offset by receding aerosol cooling (Hansen et al., 2025; Rahmstorf and Foster, 2025).

Within this global picture, Europe deserves special attention. The European continent has already experienced an estimated $+2.4^{\circ}\text{C}$ increase in mean annual temperature relative to pre-industrial baselines, nearly double the global average (EEA, 2024a), contributing to the intensification of a broad spectrum of climate extremes. Heatwaves, multi-year droughts, pluvial and fluvial flooding, wildfires, and severe extratropical storms, whose magnitude, frequency, and biophysical expression vary markedly across European subregions, are phenomena all expected to become worse over time (IPCC, 2021, 2022; Rousi et al., 2022; Copernicus Climate Change Service, 2023; Chauvet et al., 2026).

The regional expression of this warming is markedly uneven. In Eastern and South-eastern Europe, recurrent anticyclonic blocking, reduced soil moisture, and land-atmosphere feedbacks produce increasingly frequent and protracted heatwaves alongside escalating drought (Ionita and Nagavciuc, 2021; Truhetz and Mishra, 2023). Western and North-western Europe exhibit rising extreme precipitation and flood risk, linked to the poleward displacement of North Atlantic storm tracks and altered jet-stream dynamics (Barton et al., 2022; Tradowsky et al., 2023). The Mediterranean Sea has already warmed by about 1.5°C , well above the global ocean mean of roughly 1.0°C (Pisano et al., 2020; Guiot and Cramer, 2021; von Schuckmann et al., 2024), intensifying marine heatwaves and convective storm potential and compounding coastal vulnerabilities in Southern Europe (Darmaraki et al., 2019; Jézéquel et al., 2025). Wildfires arise as the compound expression of these thermodynamic and hydrological channels. Warming is projected to substantially increase burned area (Turco et al., 2018) and make compound hot-and-dry fire-weather conditions increasingly frequent (Ruffault et al., 2020), while meteorological fire danger is already expanding northward into Western and Central Europe (EEA, 2024b).

Collectively, these divergent trends contribute to a pronounced rise in interregional climate variability across Europe, complicating the attribution of localized impacts and adding uncertainty to projections of future climate-induced hazards (IPCC, 2021). Our study aims to model this uncertainty, its interconnection with underlying risk, and its economic impact. The available distributional evidence concerns global temperatures: Gadea Rivas and Gonzalo (2020, 2025), Chang et al. (2020), and Chen et al. (2023) document a rising trend consistent with the global warming hypothesis, a spatially non-uniform amplification of the upper or lower quantiles across regions, and reduced dispersion at the global scale, with CO_2 concentration changes displaying heterogeneous predictive power for cyclical temperature fluctuations.

Our analysis builds on this evidence, yet it innovates in terms of data, objective, and methodology. First, rather than focusing on global temperatures, we assess the distributional dynamics of extreme weather in Europe, i.e., extreme maximum and minimum temperatures, precipitation, wind, wildfires, drought, and hail. Second, through an automated general-to-specific (GETS) reduction approach inspired by Autometrics (Doornik, 2009; Hendry and Doornik, 2014), we assess the underlying drivers of evolving extreme-weather conditions, conditioning on the radiative forcing of anthropogenic GHG emissions and the Atlantic Multidecadal Oscillation (AMO) for medium- to long-term trend evolution, and on the El Niño-Southern Oscillation (ENSO), the North Atlantic Oscillation (NAO), and solar irradiance (SI) for short-term cyclical variability, with GHGs entering

through a highly adaptive nonlinear functional form, as in Chauvet et al. (2026). We extend the modeling approach of Chauvet et al. (2026) by explicitly accounting for natural sources of extreme-weather behavior and casting it in a panel quantile framework with GETS reduction, yielding insights into the entire conditional distribution. Within this framework, we construct indicators of climate change risk (the conditional median signal) and climate change uncertainty (the conditional interquartile range). The conditional approach overcomes two drawbacks of assessments based on unconditional moments: their inability to pin down key driving mechanisms and the noisiness that may blur underlying trends, and thereby delivers an explicit attribution analysis.

We next use our indicators to gain further insight into the post-2010 acceleration and to assess how deteriorating climate conditions transmit to the real economy. Recent research establishes that climate change affects European activity through persistent rather than purely transitory channels: severe weather destroys physical capital and infrastructure, reduces land and labor productivity, disrupts supply chains, and weakens technological progress (Parker, 2023; Bodenstein and Scaramucci, 2025; Usman et al., 2025; Chauvet et al., 2026), while income losses, precautionary savings, and population displacement curtail consumption and investment (Gagliardi et al., 2022; Natoli, 2023). Losses are most severe under high-emission scenarios (García-León et al., 2021; Kahn et al., 2021; Dietz and Lanz, 2025), remain sizable even under Paris-consistent pathways (Orlov et al., 2020), and are regionally heterogeneous (Kotz et al., 2022; Cortés Arbués et al., 2024; Caggese et al., 2025; Chauvet et al., 2026), suggesting that climate change both lowers aggregate performance and widens structural divergence across European economies.

This literature, while comprehensive, mostly focuses on channels operating through risk levels. We complement it by focusing on the uncertainty channel. Whereas risk operates through expected losses, uncertainty operates through the value of waiting. Under irreversibility and adjustment costs, heightened dispersion in the future state depresses decisions that are costly to reverse, even when the expected hazard level is unchanged (Bernanke, 1983; Dixit and Pindyck, 1994). A decade after the Paris Agreement, this channel also acquires direct policy salience. Deep uncertainty about the pace, geography, and tipping potential of climate change, rather than about its direction, moves to the center of the European policy debate, calling for precautionary and adaptive responses (Broeders and Mongelli, 2026).

Despite its potential importance, empirical evidence on climate uncertainty remains limited and focused mainly on temperature. Donadelli et al. (2020, 2022) document adverse effects of intra-annual temperature volatility on total factor productivity growth across a broad country panel, while Kotz et al. (2021) and Linsenmeier (2023) find adverse effects of temperature variability on GDP growth and economic activity, respectively. Alessandri and Mumtaz (2022) identify ex-ante temperature uncertainty in a panel VAR with stochastic volatility, finding that a typical increase in uncertainty lowers GDP growth and raises its volatility, alongside significant declines in consumption and investment. Related evidence on climate-policy uncertainty points to the same mechanism. Policy uncertainty acts as a tax on irreversible investment (Bretschger and Soretz, 2022), depresses firm-level investment, particularly in pollution- and capital-intensive firms (Berestycki et al., 2022; Fried et al., 2020), and affects investment and stock prices asymmetrically (Marotta et al., 2025). Together, these findings suggest that uncertainty, whether physical or policy-induced, can discourage irreversible investment and, more broadly, weigh on economic activity, making it an important transmission channel from climate change to macroeconomic outcomes.

We depart from this literature in five respects. First, we extend the analysis of

the second moment beyond temperature to the full spectrum of extreme-weather hazards, including drought, wind, precipitation, wildfires, and hail, for which evidence on the uncertainty dimension remains absent. Second, our uncertainty measures are not reduced-form volatility estimates but conditional interquartile ranges obtained from a panel quantile model that explicitly conditions on anthropogenic forcing and natural oscillators, thereby attributing the dispersion of extreme weather to its underlying drivers. Third, we estimate the first and second moments within a common framework, identifying their transmission mechanism from the joint responses of output, productivity, wages, consumption, investment, and labor-market margins rather than from any single outcome. Fourth, we examine not only the magnitude of these effects but also their incidence, using asymmetric specifications conditioned on income, institutional quality, adaptation and mitigation policy, and geography. Fifth, we extend the distinction between risk and uncertainty to asset prices. Because climate risk and uncertainty operate as economy-wide rather than idiosyncratic forces, they can affect firms' cash flows, discount rates, and investment opportunities, thereby shaping returns to established risk factors, such as those of Fama and French (2015). We therefore estimate these factors' exposures to ex-ante climate uncertainty separately by hazard and compare them with their exposures to the corresponding measures of realized climate risk.

We find that greenhouse gas concentrations significantly and nonlinearly drive both the level and dispersion of extreme weather in Europe, but with an important asymmetry in the role of natural forcing. Climate risk responds to anthropogenic forcing and to long- and short-period natural oscillators across virtually all hazards, whereas climate uncertainty is predominantly anthropogenic, with only a secondary contribution from the NAO; wildfires are the exception, with natural drivers rivaling the anthropogenic signal. Both moments accelerate after 2010, but their spatial patterns differ: risk increases concentrate in Central-Eastern and Mediterranean Europe, whereas uncertainty widens further west and north. This distinction reveals an important dimension of climate change that analyses based on the conditional median alone miss: extreme-weather distributions can widen even when their typical state changes little.

We then show that both risk and uncertainty depress economic activity, with uncertainty having roughly twice the effect of risk for a typical annual change. A one-standard-deviation increase in annual climate uncertainty reduces real GDP growth by about 0.27%, compared with 0.15% for risk. The contraction operates primarily through productive efficiency rather than labor utilization: labor productivity falls by 0.45% and output per hour by 0.39%, while employment and hours per worker remain largely unchanged. Real wages absorb roughly three-quarters of the productivity loss. Consumption falls by 0.31%, with its stronger response to uncertainty consistent with a precautionary channel. Investment shows no significant aggregate response, but where institutional capacity is weak its response is amplified to about four times the output response, consistent with an option-value-of-waiting mechanism.

Risk and uncertainty share a broad transmission mechanism but are not interchangeable. Uncertainty dominates for episodic and convective hazards, such as wind and maximum-temperature extremes, whereas risk dominates for more seasonal hazards such as precipitation. Wildfires operate through both channels in broadly equal measure, while hail is the only hazard for which they have opposite signs. The incidence of these effects depends primarily on absorptive capacity rather than physical exposure: efficiency losses are negligible in high-income countries but propagate to output, consumption, and wages in lower-income countries. Institutional quality attenuates the loss and determines its incidence, turning climate change from a common efficiency shock into a source of economic divergence where absorptive capacity is weak.

Finally, the asset-pricing evidence provides further, albeit weaker, support for the economic relevance of climate uncertainty. Factor exposures are concentrated in the uncertainty measures, with the value spread loading negatively on maximum-temperature and wildfires uncertainty and risk. The size, investment, and profitability factors provide further corroborative evidence. Taken together, the results show that climate change affects European economies not only through the expected intensity of physical hazards but also through the widening distribution of future outcomes, with the latter operating through productivity, precautionary behavior, irreversible investment, and financial exposures.

The remainder of the paper is as follows. Section 2 assesses the trending properties of the distributional dynamics of the E3CI index and its components, while Section 3 introduces our modeling framework. Section 4 presents estimation results on conditional uncertainty and risk measures, while Section 5 investigates their cross-country distribution properties. Section 6 assesses the macroeconomic implications of evolving climate change risk and uncertainty, both in the aggregate and hazard by hazard, together with the asymmetries in their incidence across European economies; Section 7 turns to the financial implications; and Section 8 concludes. The Online Appendix contains details on the dataset employed in the study, model selection, and the robustness analysis.

2 Nonlinear Trend Dynamics and Cross-Sectional Dispersion of European Climate Extremes

Figure 1 reports the cross-sectional interquartile range (IQR), median (MED), and their ratio (MED/IQR) for the European Extreme Events Climate Index (E3CI) across 40 European countries over 1981-2024. The E3CI is a composite measure of the extent and severity of weather-related hazards in Europe, constructed as the simple average of seven components: extreme maximum and minimum temperatures, extreme precipitation, extreme wind, droughts, wildfires, and hail (see the Online Appendix for details on index construction and country coverage). The three statistics summarize complementary dimensions of climate change across countries. The IQR measures unconditional climate uncertainty by capturing cross-sectional dispersion, the median measures climate risk by reflecting the central intensity of extreme-weather conditions, and the MED/IQR ratio provides a signal-to-noise measure of relative climate risk, indicating how clearly the climate signal emerges from cross-sectional variability.

Alongside the observed series, Figure 1 reports the corresponding nonlinear deterministic trends estimated using a third-order Fourier polynomial. All three measures exhibit pronounced nonlinear dynamics, remaining broadly stable until the early 2000s before accelerating sharply after 2010. Because the median and the IQR rise jointly while their ratio also increases, the climate signal strengthens more rapidly than cross-sectional dispersion. Climate risk has therefore become not only larger but also increasingly distinguishable from background variability, pointing to a broad-based structural shift rather than an isolated tail phenomenon. Overall, the evidence indicates that climate risk and climate uncertainty evolve jointly since the 1980s, with relative climate risk rising markedly over the last decade.

Figures A1-A3 in the Online Appendix decompose these aggregate patterns by reporting the cross-sectional IQR , median, and MED/IQR ratio for each E3CI component. This decomposition reveals that the increase in aggregate climate uncertainty since 2010 is broadly based, with positive contributions from all hazards except droughts and extreme minimum temperatures. The latter display declining cross-sectional dispersion,

consistent with global warming making not only hot temperatures warmer but also cold temperatures less severe and, consequently, more spatially homogeneous across Europe. A similar pattern emerges for both the median and the *MED/IQR* ratio, indicating that the strengthening of the aggregate climate signal is shared across most underlying hazards.

Hail represents a notable exception. Although the frequency of hail events may decline over time, the E3CI hail indicator does not capture the concurrent increase in hailstone size and destructive potential documented in the physical climate literature. Consequently, it provides only a partial representation of the evolution of hail-related climate risk.

This descriptive evidence is closely aligned with the climate-science literature, which shows that anthropogenic warming disrupts atmospheric and hydrological systems unevenly across regions and that Europe’s comparatively rapid warming intensifies extreme events, including heatwaves, droughts, floods, and storms. It is also consistent with the accelerated warming observed since 2010 and its close association with rising greenhouse-gas (GHG) concentrations (Hansen et al., 2025; Rahmstorf and Foster, 2025). To illustrate this relationship, Figure 1 also reports the NOAA Annual Greenhouse Gas Index (AGGI), a measure of the radiative forcing generated by anthropogenic GHGs. By 2024, the AGGI stands approximately 50% above its 1990 level, with roughly half of this increase occurring since 2010. Consistent with these developments, Chauvet et al. (2026) document a direct nonlinear relationship between the long-run evolution of European extreme-weather conditions and global GHG concentrations. Although this relationship is dominated by a common trend, reflecting the global nature of climate change (Bilal and Känzig, 2024), the same study also identifies substantial cross-country heterogeneity, particularly across Northern Europe.

Part of this heterogeneity may reflect the influence of slowly evolving natural climate oscillations. In particular, the Atlantic Multidecadal Oscillation (AMO) affects Northern and Southern Europe asymmetrically, with positive phases generally associated with warmer, wetter conditions in Northern Europe and drier conditions over the Mediterranean, and vice versa during negative phases (Qasmi et al., 2021). Given its multidecadal periodicity of roughly 60-90 years, the AMO provides a plausible complementary source of low-frequency variation in European extreme-weather conditions. Over the sample period, the AMO spans approximately half of one multidecadal cycle, evolving from a negative phase in the early 1980s to a sustained positive phase from the mid-1990s onward before flattening toward the end of the sample.

Whereas the AMO contributes primarily to low-frequency climate dynamics, the increasing cross-sectional dispersion documented in Figure 1 is also consistent with higher-frequency oscillations that affect European regions asymmetrically. The El Niño-Southern Oscillation (ENSO; 3-7 years), the North Atlantic Oscillation (NAO; 8-10 years), and, potentially, variations in solar irradiance (SI; about 11 years) modulate regional atmospheric circulation and precipitation patterns, thereby amplifying fluctuations around the common climate trend (Trigo et al., 2002; Brönnimann, 2007; Sirocko et al., 2012). Unlike AGGI, however, these oscillators are stationary, mean-reverting processes that exhibit no secular trend. Their influence therefore operates primarily through cross-country heterogeneity rather than through the common long-run evolution of climate conditions. By affecting different European regions with opposite signs and varying intensity, they increase cross-sectional dispersion in extreme-weather outcomes and, consequently, contribute to climate uncertainty without generating a persistent trend in aggregate climate risk.

Table 1 reports the augmented KPSS tests of Becker et al. (2006) under progressively

more flexible deterministic specifications. The results are remarkably consistent across the *IQR*, median, and *MED/IQR* series (Panels A-C), as well as across the climate drivers reported in Panel D. Under the null of level stationarity, most climate indicators, including the aggregate E3CI, MaxT, Fire, the AMO, and AGGI, reject stationarity, often at the 1% significance level. Allowing for a linear deterministic trend reduces the test statistics but leaves several rejections unchanged. By contrast, once a nonlinear Fourier trend is introduced, the statistics systematically fall below the corresponding critical values. Moreover, only a low-order Fourier expansion is required. For most series, non-rejection is already achieved with a first-order approximation, while the estimated statistics stabilize at very similar values (around 0.03-0.04) under second- and third-order specifications. This evidence indicates that the underlying climate processes are well characterized by smooth, low-frequency deterministic nonlinear trends requiring only a limited number of harmonics. Accordingly, the series are best interpreted as stationary around nonlinear deterministic trends, rather than as mean-stationary processes, linear-trend stationary processes, or stochastic-trend processes. These findings provide direct statistical support for the Fourier detrending adopted in Figures 1 and A1-A3.

Nonlinearity is also evident for AGGI. This result is economically intuitive. Over the sample covered in this study, radiative forcing is shaped by technological progress and climate-policy interventions, both of which generate periods of acceleration and deceleration in greenhouse-gas emissions rather than a uniform long-run trajectory (Estrada and Perron, 2017; Chauvet et al., 2026; yet see also Kaufmann et al., 2013, for evidence over a longer historical horizon). At the opposite extreme, the Southern Oscillation Index (SOI; ENSO), the North Atlantic Oscillation (NAO), solar irradiance (SI), and the drought component do not reject stationarity even in levels, consistent with the absence of a pronounced deterministic trend.

Overall, the evidence strongly supports the flexible nonlinear framework adopted in this paper. The climate indicators are characterized by smooth deterministic trends of varying complexity, while the principal natural oscillators remain stationary around fixed means. This distinction provides the statistical foundation for modeling climate risk through nonlinear deterministic components and climate uncertainty through the remaining stochastic variation, extending the evidence reported by Chauvet et al. (2026) for the cross-sectional mean to the entire cross-sectional distribution.

3 Modeling climate change risk and uncertainty

Consider a generic extreme weather indicator y_t , for instance, extreme maximum temperature, taking values across N countries in any given time period $t = 1, \dots, T$. Denoting its cumulative distribution function conditional on time t information I_t as $G(y_t|I_t)$, its τ th conditional quantile is defined as

$$Q_{y,t}(\tau) = \inf \{y_t : G(y_t|I_t) \geq \tau\}, \quad (1)$$

i.e., the minimum value of y_t from among all those values whose cumulative distribution function value equals or exceeds τ , with $\tau = 0.25, 0.5, 0.75$ in our analysis. The lower quantile $\tau = 0.25$ yields the indicator lower tail outcome, i.e., the value below which the indicator falls with (at least) 25% probability in period t ; symmetrically, the upper quantile $\tau = 0.75$ yields the indicator upper tail outcome, i.e., the value below which the indicator falls with 75% probability. The median corresponds to $\tau = 0.5$.

A baseline panel regression to account for the evolution over time of extreme weather

behavior is

$$y_{j,t} = \alpha_j + \beta y_{j,t-1} + \sum_i \gamma_i x_{i,t} + u_{j,t}, \quad (2)$$

where $y_{j,t}$ is the extreme weather indicator in country j in period t , $x_{i,t}$ is the generic i th control variable, among those expected to drive extreme weather developments, i.e., anthropogenic factors, such as greenhouse gas emissions, as well as natural factors, such as solar irradiance (SI) and other near-periodic natural oscillators, such as SOI, NAO, and AMO, α_j is the country fixed effect, and $u_{j,t}$ is an i.i.d. residual. Because the conditioning variables are global or hemispheric, they do not carry a country subscript; cross-country heterogeneity enters through the fixed effects (and, in the per-country estimation introduced below, through country-specific slope coefficients). By including country fixed effects in addition to the key control variables, FE OLS estimation of (2) should deliver a reliable assessment of the mean response of extreme weather conditions to a set of critical determinants. While this may be sufficiently informative, depending on the aim of the estimation exercise, it may neglect important asymmetries in extreme-weather conditional responses, which quantile regression can uncover.

Neglecting technicalities concerning the actual handling of fixed effects, the least squares estimate minimizes the sum of the squared error terms

$$\sum_{j,t} u_{j,t}^2.$$

By contrast, the quantile regression (Koenker and Bassett, 1978) estimate minimizes a weighted sum of the positive and negative error terms

$$\tau \sum_{u_{j,t}(\tau) > 0} |u_{j,t}(\tau)| + (1 - \tau) \sum_{u_{j,t}(\tau) < 0} |u_{j,t}(\tau)|, \quad (3)$$

where the weight is the quantile τ . The optimization of the loss function in (3) yields an estimated linear relationship between the dependent and independent variables such that a proportion τ ($1 - \tau$) of the data lies below (above) the quantile regression line. Bassett and Koenker (1982) first established the consistency and asymptotic normality of the quantile regression estimator.

We ground our measure of climate uncertainty on a panel interquartile range (*IQR*) regression. The *IQR* regression models the spread of the middle 50% of the data. The observational model underlying the quantile regressions is

$$y_{j,t} = \alpha_j + \beta(\tau) y_{j,t-1} + \sum_i \gamma_i(\tau) x_{i,t} + u_{j,t}(\tau), \quad (4)$$

where the error term $u_{j,t}(\tau)$ satisfies the quantile restriction $Q_{u_{j,t}(\tau)}(\tau|I_t) = 0$, so that the implied τ th conditional quantile function is

$$Q_{y_{j,t}}(\tau|I_t) = \alpha_j + \beta(\tau) y_{j,t-1} + \sum_i \gamma_i(\tau) x_{i,t}. \quad (5)$$

The *IQR* regression involves estimating (5) at the third quartile ($\tau = 0.75$)

$$Q_{y_{j,t}}(0.75|I_t) = \alpha_j + \beta(0.75) y_{j,t-1} + \sum_i \gamma_i(0.75) x_{i,t}, \quad (6)$$

and at the first quartile ($\tau = 0.25$)

$$Q_{y_{j,t}}(0.25|I_t) = \alpha_j + \beta(0.25) y_{j,t-1} + \sum_i \gamma_i(0.25) x_{i,t}, \quad (7)$$

and computing the difference

$$IQR_{j,t}|I_t = [\beta(0.75) - \beta(0.25)] y_{j,t-1} + \sum_i [\gamma_i(0.75) - \gamma_i(0.25)] x_{i,t}, \quad (8)$$

where $IQR_{j,t}|I_t = Q_{y_{j,t}}(0.75|I_t) - Q_{y_{j,t}}(0.25|I_t)$. In our context, the *IQR* regression captures how climate uncertainty, as proxied by the conditional dispersion of extreme weather outcomes, changes with the predictors. In regressions (6) and (7), only the effects of the predictors $y_{j,t-1}$ and $x_{i,t}$ are allowed to depend upon the quantile τ . The unit effects α_j capture unobserved, country-specific sources of variability not controlled for by the other covariates, while the common conditioning variables measure the contribution of common sources of climate variability. Even in our application, where the time series dimension T is sizable and similar to the number of countries N ($N = 40$ and $T = 44$), estimating τ -dependent fixed effects might be difficult. We therefore follow the common practice of modeling the unit fixed effects as quantile-invariant. Regarding the dynamic specification, the sizable time dimension shields our estimates from Nickell bias, which is of order $1/T$ and becomes a practical concern only when the time dimension is small relative to the cross-sectional dimension (see Galvao, 2011, for the dynamic panel quantile regression case). We therefore do not expect any sizable correlation between the lagged dependent variable and the error term that could arise from the demeaning process in fixed effects estimation.

Similarly, our measure of risk is obtained from the estimation of the conditional median function, given by

$$Q_{y_{j,t}}(0.5|I_t) = \alpha_j + \beta(0.5)y_{j,t-1} + \sum_i \gamma_i(0.5)x_{i,t}.$$

Together, these measures deliver our measure of relative risk, given by the signal-to-noise ratio

$$Q_{y_{j,t}}(0.5|I_t) / (IQR_{j,t}|I_t).$$

We use a rich specification for the covariates $x_{i,t}$ in the dynamic panel quantile regressions in (6) and (7).

First, we include various long- and short-term near-periodic oscillators, i.e., AMO, NAO, SOI (our observable proxy for ENSO conditions), and SI, that is, the block

$$\theta_{AMO}(\tau)AMO_t + \theta_{NAO}(\tau)NAO_t + \theta_{SOI}(\tau)SOI_t + \theta_{SI}(\tau)SI_t,$$

where $\theta_k(\tau)$, $k = AMO, NAO, SOI, SI$, are parameters.

Second, in light of the nonlinearities detected by the augmented KPSS tests for the various dispersion proxies and previous results by Chauvet et al. (2026), we allow radiative forcing to enter the quantile regressions nonlinearly. Specifically, we model the anthropogenic contribution to evolving climatic variability through the trigonometric polynomial in the global radiative forcing variable

$$\sum_{l=0.5}^{l^*} \theta_{s,l}(\tau) \sin(2\pi l AGGI_t^*) + \sum_{l=0.5}^{l^*} \theta_{c,l}(\tau) \cos(2\pi l AGGI_t^*),$$

where $AGGI_t^*$ is the AGGI index re-scaled to the interval $[0, 1]$, and $\theta_{s,l}(\tau)$, $\theta_{c,l}(\tau)$ are parameters. Our choice to condition climate variability on global emissions is grounded in evidence that both global and local GHG emissions matter, but in different ways. The evidence on global warming shows that global emissions drive overall warming, in turn

increasing the likelihood of extreme weather. In contrast, local emissions can influence specific regional conditions, though usually to a lesser degree. GHGs mix throughout the atmosphere, and CO₂ emitted in one place spreads globally within about a year (our analysis frequency). Hence, the warming that might fuel extreme weather is a global cumulative effect. Moreover, the order of the trigonometric polynomial, $l^* = 3$, yields a minimum periodic cycle of about 14 years, low enough to avoid contamination with the natural short-term near-periodic oscillators (among which, SI has the longest period, of about 11 years).

Hence, $\gamma_i(\tau) = \theta_{AMO}(\tau), \dots, \theta_{SI}(\tau), \theta_{s,0.5}(\tau), \theta_{c,0.5}(\tau), \dots, \theta_{s,l^*}(\tau), \theta_{c,l^*}(\tau)$ are the parameters of the conditioning regressor set. Although we model the response to global variables or factors, the quantile model implicitly accounts for local heterogeneity in extreme-weather responses. In fact, $\gamma_i(\tau)x_{i,t}$ should not be interpreted as the effect on a predefined group of countries. Instead, it represents the effect for countries that belong to quantile τ of the conditional distribution of $y_{j,t}$. Consequently, the heterogeneity in the estimated effects of GHGs and natural oscillators arises endogenously from the data distribution rather than from externally imposed groupings.

In estimation, we implement the minimum distance estimator of Melly and Pons (2025). The estimator proceeds in two stages. The first stage computes a quantile regression within each country under an unrestricted specification that includes the full set of conditioning variables; at this stage the slope parameters are country-specific, i.e., $\beta_j(\tau)$ and $\gamma_{i,j}(\tau)$. The second stage applies GMM to the first-stage fitted values, delivering the common parameters in (5) and, thereby, a common climate-uncertainty measure for Europe as a whole. At the second stage, we apply a general-to-specific (GETS) selection, retaining only the statistically significant regressors. We carry out selection at the median, and impose the resulting specification unchanged on the first- and third-quartile regressions. While this specification choice makes the interquartile range a well-defined contrast by removing one possible source of quantile crossing, it does not enforce monotonicity of the estimated conditional quantile function. We therefore verify monotonicity directly, reporting the share of country-year observations at which the estimated quantiles cross. Where crossing occurs, we monotonize the estimated curves by rearrangement, following Chernozhukov et al. (2010). Melly and Pons (2025) establish the consistency and asymptotic normality of the two-step estimator. Their simulation results show that the estimator performs well in small samples, even when the cross-sectional dimension is moderate, making its use reliable in our context.

The two-step procedure naturally suggests an alternative modeling strategy that emphasizes cross-country heterogeneity beyond what the endogenous quantile-based grouping captures, referring explicitly to the regression slope parameters, i.e., a country's extreme weather response to evolving GHG emissions and natural oscillators. The alternative procedure is country-by-country quantile regression estimation. Yet, differently from Melly-Pons, it is not based on the unrestricted specification common across countries, but on GETS model selection (carried out at the median), retaining in each country's quantile regression only the significant trigonometric (and lag) components, while conditioning on the full set of natural oscillators. In this case, we also verify monotonicity and fix violations by rearrangement. We then obtain European aggregates by averaging across countries. We refer to this approach as per-country GETS estimation.

3.1 Interpreting the conditional interquartile range as climate uncertainty

Three remarks clarify the interpretation of our uncertainty measure. First, we quantify the ex ante width of the predictive distribution from which each country-year realization is drawn. The conditional quantiles in (5) characterize the distribution of extreme-weather outcomes given the state of the climate system, captured by accumulated anthropogenic forcing and the phase of the natural oscillators, and the conditional interquartile range in (8) measures its width. Because the country fixed effects are quantile-invariant, they shift the location of the conditional distribution but cancel out in the interquartile contrast. Consequently, is purged of time-invariant cross-country differences and measures the prospective variability facing each country around its own climatological baseline rather than the dispersion of climatological conditions across countries. This is the economically relevant notion of uncertainty for agents making irreversible decisions. At the beginning of the period, investors and policymakers observe prevailing climate conditions but do not observe the realization within the predictive distribution. The option value of waiting and the desired precautionary buffer therefore depend on the distribution's dispersion, not solely on its center (Bernanke, 1983; Dixit and Pindyck, 1994).

Second, our measure differs deliberately from the forecast-error volatility that defines uncertainty in much of the macroeconomic literature (Jurado et al., 2015). Rather than asking whether forecast errors become more volatile, we ask whether the distribution of climate outcomes itself widens and explicitly attribute this widening to anthropogenic forcing and natural oscillations. These concepts are complementary rather than competing. A wider predictive distribution remains uncertain even when its increased dispersion is fully anticipated, because agents know only the distribution, not the realization that is drawn from it. This distinction lies at the core of the real-options framework, where irreversible investment responds to the known dispersion of future outcomes rather than to forecast errors per se (Dixit and Pindyck, 1994; Bloom, 2009). Our approach therefore complements that of Alessandri and Mumtaz (2022), who measure temperature uncertainty through the conditional volatility of forecast errors, by extending the analysis to the full spectrum of extreme-weather hazards and explicitly identifying the physical drivers of uncertainty.

Third, estimating uncertainty through filtered volatility is not well suited to our data. The climate indicators and the residuals from the median regressions are annual and span only 44 observations, making GARCH and stochastic-volatility models weakly identified and prone to highly persistent boundary estimates. The resulting conditional-volatility measures therefore provide noisy estimates of time-varying uncertainty. By contrast, the panel quantile framework exploits both the cross-sectional and temporal dimensions of the data, identifying conditional dispersion from the full set of country-year observations rather than from a single short time series of squared innovations. This yields a substantially better-identified estimate of time-varying climate uncertainty at the annual frequency.

4 Empirical results

Table 2 reports the selected conditional-quantile models estimated with the Melly and Pons (2025) minimum-distance estimator, our benchmark, with the specification chosen by GETS at the median. The retained trigonometric covariates, a Fourier expansion in the anthropogenic forcing index AGGI, are significant across quantiles in most cases. Consistent with the augmented (Fourier-)KPSS evidence, the indices with a pronounced

secular trend (E3CI, MaxT, MinT, Prec, Wind, Fire) retain the lower-order trigonometric components, alongside the AMO, which itself enters significantly in several cases (E3CI and Wind across quantiles, MaxT at the median, Drought at the first quartile, Hail at the third). Conversely, the two indices with no marked trend, Drought and Hail, retain sparser, higher-order trigonometric terms, the signature of a weak or purely cyclical secular component. Anthropogenic forcing (AGGI) and the long-period natural oscillation (AMO) thus jointly shape the trend behavior of the extreme-weather quantiles, confirming contributions of both anthropogenic and natural sources to the evolution of European extreme weather and extending the mean-level evidence of Chauvet et al. (2026) to the full conditional distribution.

Crucially, the AGGI terms load asymmetrically on the lower and upper quantiles: as accumulated forcing pushes the conditional distribution toward the extreme threshold, the exceedance response is convex, displacing the upper quantile ($\tau = 0.75$) more than the lower one ($\tau = 0.25$). The clearest case is Fire: moving from the lower to the upper quartile, the loading on the leading cosine term strengthens from -0.17 to -1.15 and that on the leading sine term from an insignificant 0.06 to 0.54 . Anthropogenic forcing is therefore a driver not only of climate risk, through its effect on the median of each indicator, but also of climate uncertainty, through the resulting widening of the *IQR*. This dual role holds across the trending indices (E3CI, MaxT, MinT, Prec, Wind and, most dramatically, Fire) and is weak only for the two non-trending indices, Drought and Hail, whose *IQR* carries no significant trigonometric term.

The AMO, where significant, uniformly amplifies extreme-weather behavior, the single exception being Drought at the first quartile, where its effect is negative. It does not, however, significantly affect the cross-country dispersion (*IQR*) of any indicator. The AMO shifts the level of risk without widening its band. The short-period oscillators (NAO, SOI, SI) instead govern the cyclical variability of the quantiles. The most pervasive is the NAO, significant at every quantile for every indicator, except Wind and Hail, for which it is significant at least one quantile. Based on its point estimates, the NAO increases overall extreme-weather activity (E3CI) through positive effects on MaxT, Drought, Wind, and Fire, and a negative effect on MinT, while it stabilizes Prec and Hail. It also contributes to uncertainty. It widens the *IQR* of E3CI, Wind, Fire and Hail and narrows that of MinT.

ENSO (SOI) influences overall cyclical conditions (E3CI) chiefly through MaxT, Drought, Prec and Fire. Its level effect is stabilizing through MaxT and Prec (negative across quantiles) and destabilizing through Drought and Fire (positive at the upper quantiles). It also acts on dispersion, compressing the *IQR* of MaxT while widening those of Drought and Fire. Solar irradiance (SI) acts most strongly on temperature and precipitation extremes: it raises the median of MaxT and Prec and lowers that of MinT, and it stabilizes Drought, Fire, and Hail; on the composite (E3CI) and on Wind, its effect is at most marginal. On dispersion, SI matters in a single instance: it widens the *IQR* of Fire.

Taken together, anthropogenic forcing and the natural oscillators, long- and short-period alike, affect the trend and cyclical behavior of the extreme-weather quantiles, and hence climate risk, for essentially every indicator. Climate uncertainty, by contrast, is predominantly anthropogenic. The *IQR* is driven mainly by AGGI, with a secondary contribution from the NAO (E3CI, MinT, Hail and Fire). Fire is the exception in degree as well as in kind: its *IQR* is jointly and strongly determined by anthropogenic forcing and by all three short-period oscillators (NAO, SOI and SI), making it the only indicator for which the natural cyclical drivers rival the anthropogenic signal in shaping uncertainty. These results reinforce the evidence that anthropogenic warming is not only

disrupting weather and weather-related conditions in Europe but is doing so in a spatially heterogeneous way (IPCC, 2021, 2022; Rousi et al., 2022; Copernicus Climate Change Service, 2023; Chauvet et al., 2026).

Figures 2-4 plot the estimated IQR , the conditional median (MED), and the median-to- IQR (MED/IQR) ratio implied by the Melly-Pons estimates for the E3CI index and its components. As shown in Figure 2, overall cross-country dispersion (E3CI) is essentially flat until 2010 and then climbs sharply. MaxT drives the rise (from 0.15 to 1.05), with Fire (explosive after 2011, up to 2.25), and Prec (a U-shape: a trough in the mid-1990s followed by a steady climb to 0.37); Wind and Hail show a more volatile increase after 2014. The increase is not universal, however. The MinT IQR shows no upward trend (it oscillates and ends low, at 0.22), and the Drought IQR stays essentially flat, in the 0.5-0.7 range. As shown in Figure 3, overall risk (E3CI) is likewise flat until 2008-2010 and then breaks upward, to 0.30. The break is supported coherently by the thermal block (MaxT, MinT) and by Fire. MaxT rises almost monotonically (from negative values to 1.75), indicating hot extremes that are more frequent and intense, while MinT falls (peaking in the mid-1980s, then drifting to -0.35), indicating cold extremes that are less frequent and intense; since MinT enters the aggregate with inverted sign, its decline contributes positively to E3CI. The one genuine misalignment is the decline in Hail, which points to a real attenuation of hail risk. Finally, as shown in Figure 4, despite rising dispersion, the risk signal has become increasingly distinct overall (E3CI), driven by the MaxT, MinT, and Fire components and, since 2011, by Prec. The Drought and Wind components reveal no distinct pattern, while Hail contributes in the opposite direction, consistent with the misalignment already noted for the median. Overall, both climate uncertainty and climate risk have increased over the sample period; yet, as the median has outpaced the widening dispersion, the risk signal has become increasingly distinct.

As a robustness check on the pooled Melly-Pons estimates in Table 2, we re-examine the drivers using the per-country GETS models. The assessment reported in the Online Appendix shows that our central findings are fully robust to the estimation method, with the per-country GETS approach yielding the same substantive conclusions as the Melly-Pons specification. We also compare the two estimation routes on statistical grounds, using the pre-correction quantile-crossing rate and the out-of-sample pinball loss, computed in a rolling-origin, one-step-ahead prediction exercise over the post-2010 period. Per-country GETS generally performs better in terms of the pre-correction crossing rate, whereas Melly-Pons FE performs better in the out-of-sample exercise. The performance differences are small in both cases. Overall, for the aggregate analysis, we retain Melly-Pons FE as the primary specification for comparability and parsimony, and report per-country GETS as a coequal robustness specification throughout. Conversely, we use per-country GETS as the headline specification when assessing cross-country heterogeneity. See the Online Appendix for details.

5 The cross-country distribution of climate risk and uncertainty

We further investigate climate risk and uncertainty dynamics by assessing cross-country heterogeneity. We investigate the cross-country distribution of the post/pre change in the conditional IQR , MED , and MED/IQR ratio of the fitted distribution, obtained via per-country GETS, from two complementary perspectives. The first, the country analysis, is a snapshot: where each country sits in this space and how many dimensions

the configuration spans. The second, the convergence analysis, is its dynamics: whether that distribution is spreading out and whether a country's starting position predicts its subsequent change. Both rest on the same pre/post decomposition.

Let $i = 1, \dots, N$ index countries ($N = 40$) and t index years over the balanced panel. For a generic country-year series $x_{it} \in \{MED_{it}, IQR_{it}, MED_{it}/IQR_{it}\}$, let b denote the break year, with the pre- and post-break windows

$$T_0 = \{t : t \leq b\}, \quad T_1 = \{t : t > b\},$$

and let $n_p, p \in \{0, 1\}$, denote the number of years in window T_p . For each country and sub-period, we define a level statistic (the sub-period mean $m_i^{(p)}$) and a volatility statistic (the sub-period standard deviation $v_i^{(p)}$),

$$m_i^{(p)} = \frac{1}{n_p} \sum_{t \in T_p} x_{it}, \quad v_i^{(p)} = \sqrt{\frac{1}{n_p - 1} \sum_{t \in T_p} (x_{it} - m_i^{(p)})^2}. \quad (9)$$

5.1 Methods

Country analysis The snapshot (the country analysis) assesses the cross-country standardized post-to-pre change in the level statistic

$$d_i = m_i^{(1)} - m_i^{(0)}, \quad zd_i = \frac{d_i - \bar{d}}{\sigma_d}, \quad (10)$$

where $\bar{d} = N^{-1} \sum_i d_i$ and $\sigma_d = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (d_i - \bar{d})^2}$. For the E3CI index and its components, the snapshot analysis summarizes each country by the joint signature $(zd_i^{MED}, zd_i^{IQR}, zd_i^{MED/IQR})$, as delivered by PCA.

Convergence analysis The dynamics (convergence analysis) assesses how the distribution of $m_i^{(p)}$ and $v_i^{(p)}$ evolves between sub-periods, through σ - and β -convergence. Specifically, the regressand of the β -convergence regression is $d_i = \Delta m_i$, so the convergence analysis asks whether the geography of the distribution of risk investigated in the country analysis is becoming sharper (rising cross-country dispersion) or fading (catch-up).

Concerning σ -convergence, we measure the cross-country dispersion in mean and volatility by the cross-country standard deviation of the country levels and of the country volatilities,

$$\sigma_m^{(p)} = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (m_i^{(p)} - \bar{m}^{(p)})^2}, \quad \sigma_v^{(p)} = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (v_i^{(p)} - \bar{v}^{(p)})^2}, \quad (11)$$

where $\bar{m}^{(p)} = N^{-1} \sum_i m_i^{(p)}$ and $\bar{v}^{(p)} = N^{-1} \sum_i v_i^{(p)}$. The reported convergence ratios are the post-to-pre ratios of these standard deviations,

$$R_m = \frac{\sigma_m^{(1)}}{\sigma_m^{(0)}}, \quad R_v = \frac{\sigma_v^{(1)}}{\sigma_v^{(0)}}, \quad (12)$$

with the convention

$$R_{m,v} > 1 \Rightarrow \text{divergence}, \quad R_{m,v} < 1 \Rightarrow \text{convergence}.$$

For β -convergence, we estimate two cross-sectional regressions on the N countries using the MM estimator (Yohai, 1987) with robust standard errors. The level regression projects the pre-to-post change in the country level on its initial level; the volatility regression projects the change in the country volatility on its initial volatility:

$$\text{Level} : m_i^{(1)} - m_i^{(0)} = \alpha_m + \beta_m m_i^{(0)} + u_i, \quad (13)$$

$$\text{Volatility} : v_i^{(1)} - v_i^{(0)} = \alpha_v + \beta_v v_i^{(0)} + e_i, \quad (14)$$

with the convention

$$\beta_{m,v} < 0 \text{ (significant)} \Rightarrow \text{convergence}, \quad \beta_{m,v} > 0 \text{ (significant)} \Rightarrow \text{divergence}.$$

For the MED_{it}/IQR_{it} ratio, we perform the volatility analysis using the same statistics as for the IQR and the median themselves. The level analysis, by contrast, uses the ratio of MED and IQR means rather than the mean of the MED/IQR ratio, consistent with what the between dimension aims to measure. The between dimension looks at the average level of each country's signal-to-noise ratio across the two sub-periods. The country's average magnitudes, i.e., the average median over the average IQR , best define this ratio, rather than the average of the annual ratios. These are two distinct estimators of the same latent quantity, and they differ by a Jensen bias: the mean of a ratio is biased upward by an amount that grows with the variance of the denominator, so the mean-of-ratios inflates countries with a volatile annual IQR in a way unrelated to their true signal-to-noise level. The ratio of means eliminates that term by construction. We have, however, also carried out the analysis using the average of the ratios, without finding any qualitatively different results (Table A3-C in the Online Appendix).

5.2 Country analysis

Figure 5 shows the post/pre change in aggregate climate risk and uncertainty (E3CI) after the 2010 break from two complementary angles. The left panel maps the standardized change zd_i in the conditional median (top plot) and IQR (bottom plot), grouped into percentile bands (below the 40th, the 40th-60th median band, and above the 60th). The largest median increases concentrate in Central-Eastern and Mediterranean Europe, i.e., the Iberian Peninsula, Italy, Germany, the Balkans and Ukraine, whereas the British Isles, Scandinavia, Iceland, Poland and France fall below the cross-country median. The largest uncertainty (IQR) increases share this Mediterranean-Balkan and central-European core, i.e., Spain, Portugal, Germany, Italy and the western Balkans (Croatia, Bosnia and Herzegovina, Serbia, Bulgaria, Romania) are again in the top tercile, but their footprint shifts westward and northward. France and parts of Scandinavia and the Baltic (notably Sweden and Lithuania) rank among the highest in IQR even though their median rise is below average, so their increase is dispersion-led rather than level-led. The map of below-median IQR change is correspondingly different from the median one. The British Isles, Iceland, Poland, the Netherlands and Belarus stay low on both, but Ukraine, one of the largest median increases, falls into the lowest IQR tercile, the clearest case of a rise concentrated in the level rather than in the dispersion of climate risk. In short, where MED and IQR agree (the Mediterranean-Balkan core, plus Germany), risk and uncertainty have both increased; where they diverge, France and Scandinavia gained mostly in uncertainty and Ukraine almost entirely in level.

The right panel summarizes the joint behavior of the three change moments, i.e., MED , IQR and the MED/IQR ratio, through their first two principal components, which jointly account for 95.9% of the variance and so render the configuration essentially two-dimensional. The first component (PC₁, 68.3%) is a severity gradient loading

all three moments positively and with comparable weight (0.67, 0.48 and 0.56 on the *MED*, *IQR* and the *MED/IQR* ratio), so that a higher PC_1 denotes a broadly larger risk increase; consistently, the horizontal axis almost reproduces the median terciles of the map. The second component (PC_2 , 27.6%) is a modality contrast orthogonal to the level, loading the *IQR* positively (0.78) against the *MED/IQR* ratio (-0.63) while leaving the median essentially out (-0.04); a higher PC_2 therefore signals a change driven by a widening of the dispersion (uncertainty) rather than by the level. Coloring each country by the sign of its two scores yields a descriptive Risk-by-Uncertainty grid. Among high-risk economies it separates those whose increase comes with rising dispersion (red: Croatia, Germany, Bosnia and Herzegovina, Slovenia, Bulgaria, Romania) from those whose increase is mainly on the level (orange: Spain, Italy, Austria, Switzerland, Montenegro, Ukraine, Malta and Belarus). These countries, together with Greece (green) and with Estonia and Czechia (orange), populate the above-median change tercile of the *MED/IQR* ratio. Among low-risk economies, on the other hand, the colors distinguish a dispersion-led group (blue: Iceland, Cyprus, Denmark, France, Hungary, Finland, Belgium, Luxembourg, North Macedonia) from a quieter, ratio-led group (green: the United Kingdom, Ireland, the Netherlands, Poland, Portugal, Greece, Albania, Serbia). These countries, together with Andorra (red), populate the below-median change tercile of the *MED/IQR* ratio. In between lie the countries in the median-change tercile of the *MED/IQR* ratio (Latvia and Portugal, green; Norway, blue; Lithuania, Moldova, Romania, the Slovak Republic and Sweden, red). As a caveat, the partition imposes a sharp threshold. Countries close to either axis (Latvia and Estonia on PC_1 , Norway and Moldova on PC_2) might switch quadrants under negligible perturbations of their scores (see Table A2 in the Online Appendix for details on the PCA results; see also Figure A9 for a direct comparison across geographical maps for the E3CI index).

5.3 Hazard analysis

Figures 6-8 disaggregate the single *MED* and *IQR* gradients of the aggregate E3CI into its seven hazard components for the 2010 break. The heatmaps (Figure 6) report, for each country, the standardized post/pre change in the conditional median (left-hand panel) and *IQR* (right-hand panel) of MaxT, MinT, Drought, Prec, Wind, Fire and Hail (red above the cross-country mean, blue below, capped at ± 2 standard deviations on a shared scale).

The conditional median heatmap clearly shows that countries with a comparable overall median rise reach it through very different hazard mixes, i.e., a fire-driven profile (Croatia, France, Switzerland, Germany, Bosnia-Herzegovina, Romania, Hungary), a temperature-driven one (Spain, Slovenia, Malta, Italy, Latvia, Montenegro, Croatia, Bosnia-Herzegovina), a drought-driven one (Romania, Ukraine, Latvia, Lithuania, Poland), a precipitation-driven one (Luxembourg, Finland, the Netherlands, the United Kingdom, Greece, Montenegro), a wind-driven one (Montenegro, Albania, North Macedonia, Malta), and a hail-driven one (Spain, Lithuania, Cyprus, Bulgaria, Albania, Montenegro, Estonia, Switzerland), with no column uniformly red or blue, so each hazard carries its own geography.

The right-hand panel shows that this hazard-by-hazard geography is, for the most part, shared by the dispersion. For the heat- and convection-driven hazards, the *IQR* map reproduces the median map almost country for country, so risk and uncertainty rose together rather than apart. Fire is the clearest case: Croatia, France and Switzerland head both panels (with Germany close behind). The same comovement holds for MaxT (Spain, and to a degree France, Croatia and Switzerland), Drought (Ukraine, Romania,

Lithuania), Prec (Luxembourg and Greece), and Hail (Spain, Switzerland, Bulgaria and Estonia). Because the leaders coincide, an increase in the typical severity of these hazards also proportionately widens their year-to-year spread. This is precisely why the first principal component of the three-moment analysis loads positively on both the median and the *IQR*. The *IQR* is not a mere copy of the median, however. It carries an independent uncertainty geography concentrated in continental North-Western Europe, where the Netherlands, Belgium and Luxembourg post large dispersion increases, for Wind and Prec above all, without a matching rise in the median. These are the dispersion-led cases, in which uncertainty grows faster than the level, and they are exactly the countries that fall in the lowest *MED/IQR* tercile, confirming that the relative measure isolates the one piece of information *MED* and *IQR* do not share.

The principal-component scatters (Figures 7 and 8) quantify this heterogeneity. In contrast to the near-two-dimensional aggregate index, the seven-component signal is genuinely multidimensional, with the first three components explaining only about 25%, 20% and 16% of the variance (cumulatively 62%) of the median and *IQR* changes, an essentially flat eigenvalue spectrum in which no single factor dominates (see Table A2 in the Online Appendix). We show this configuration on two axis pairs (PC_1 vs. PC_2 and PC_1 vs. PC_3), with signs oriented so that higher scores match the named mode. Consistent with the heatmap patterns, both commonalities and heterogeneities can be noted on the driving axes.

For the median changes, PC_1^m is a Hot-Dry mode, loading positively on Drought, Fire, MaxT and MinT and negatively on Prec and Hail; it is consistent with a typical pattern of slow, persistent aridification. PC_2^m is a Hot-Convective mode, loading positively and with comparable weight on Wind, Hail and MaxT; it is consistent with a typical pattern of severe episodic storms. PC_3^m is a Wet-Fire mode, loading positively on Prec, Fire and MaxT (negatively on Drought); it is consistent with a pattern typically leading to fuel-limited wildfires. The patterns detected in the *IQR* changes partially overlap, describing the volatility dimension of some of the level phenomena. In this respect, PC_1^v yields a Hot-Dry-Convective Volatility mode, matching elements of PC_1^m and PC_2^m , as it loads positively also on Hail. PC_2^v is a Wet-Fire Volatility mode, therefore matching PC_3^m . In contrast, PC_3^v loads positively on Wind and Drought and negatively on MaxT, consistent with a drought/weather-limited wildfire context; hence, we call it a Dry-Fire Volatility mode.

Coloring each country by the sign of its scores yields descriptive 2×2 grids, Hot $\times$ Wind on the left and Hot $\times$ Wet on the right for the median changes; Hot $\times$ Wet on the left and Hot $\times$ Dry on the right for the *IQR* changes. Taken together, these two sets of figures make the same point as the heatmaps from opposite ends. Hazard-level profiles are heterogeneous (heatmap), and that heterogeneity does not collapse onto a common factor but lives in roughly three comparable dimensions (PCA). Yet some interesting patterns emerge from jointly reading the level and volatility signatures. We disentangle five geographic areas, based on a country's exposure to the risk and uncertainty profiles, as summarized in Figure 9. The zones are defined on a country's PC_1 , PC_2 , and PC_3 scores, where H stands for high and L for low. For instance, a zone indexed as HHH is high on all three PCs, and a country belonging to it would be located in the NE quadrants of both plots in either Figure 7 or 8. Accordingly, we have: Z1 Multi-hazard (HHH; all high); Z2 Hot-led dual (HHL, HLH; PC_1 high and exactly one of PC_2/PC_3 high); Z3 Thermo-arid (HLL; only PC_1 high); Z4 Storm/Fire-led (LHH, LHL, LLH; PC_1 low and at least one of PC_2/PC_3 high); Z5 Quiet (LLL; none high).

Reading the median-based zone map, the spatial signature of the level shift is dominated by the Z2 hot-led-dual zone, which fills almost the entire continental interior of

Europe. France, Germany, the Carpathian-Pontic region, and the Baltic states all rise jointly on the hot-dry-convective and wet-fire modes, so the central tendency of these hazard families moves upward together across the landmass. By contrast, the strongest category, Z1 multi-hazard, is spatially marginal in the level decomposition. It shrinks to a small Adriatic core (Slovenia and Bosnia and Herzegovina), indicating that very few countries experience a coordinated upward shift on all three modes at once in the level. Portugal and the eastern regions fall into Z3 thermo-arid, a level rise confined to the hot-dry axis without the accompanying storm-fire signal, while Spain joins the storm/fire-led Z4. The Atlantic-Nordic fringe, i.e., Ireland, Iceland, the United Kingdom, Norway, Sweden and Denmark, is uniformly Z5 quiet, its median essentially flat on every mode. The geographic reading is therefore that level risk is an aridification-plus-fire signal concentrated in the continental interior, with a muted maritime periphery: distance from the ocean drives the shift, and the open-Atlantic margin absorbs it.

The *IQR*-based zone map reorganizes the same countries into a somewhat different spatial pattern. Here the Z1 multi-hazard zone is neither marginal nor scattered: it forms a compact, contiguous Alpine-Dinaric-Carpathian arc running from France through Switzerland, Italy, Slovenia, Croatia and Bosnia and Herzegovina to Romania. These mountain regions are the core of the dispersion increase, i.e., the places where the spread, and hence the prospective uncertainty, rises simultaneously across the hot-dry-convective, wet-fire, and dry-fire modes. The Nordic countries, the North Sea rim, and the central plains switch to Z4 storm/fire-led (the wind-fire dispersion mode rising while the others stay quiet), and the Atlantic periphery again remains Z5 quiet. The mountains, not the continental interior, are the volatility hotspot.

In general, the climate level shifts across the continental interior while climate uncertainty concentrates over the mountains. This divergence has a straightforward mechanistic basis: the median is robust to the tails by construction, whereas the *IQR* measures them, so a climate that generates more extremes without shifting its typical state is invisible to the level but visible to the dispersion. Ocean thermal inertia damps the drift of the central tendency along the maritime periphery while leaving large-scale circulation, and hence wind, wildfires, and temperature variability, free to widen, which is why the Atlantic-Nordic fringe is quiet in the median yet storm/fire-led in the *IQR*. Conversely, mountain-induced thresholds over the Alpine-Dinaric-Carpathian arc produce intermittent events rather than a shift in the distribution, accumulating dispersion without necessarily raising the median; the mountains emerge as the volatility core but not the level hotspot. Hence, a climate change assessment built on the median alone would misplace the European hotspot, and the two moments must be read jointly rather than as substitutes.

5.4 Convergence analysis

We report the convergence analysis in Table 3. The results are clear-cut and fully aligned with the country-level evidence, while adding further insight.

First, for the E3CI index, the σ -convergence estimates point to growing cross-country heterogeneity after 2010. For the level of the indicators, the dispersion ratio R_m roughly doubles for the *IQR* and *MED/IQR* ($R_m = 2.1$ and 2.0) and more than triples for the median ($R_m = 3.5$). Consistent with this, the β -convergence slopes for the *IQR* and the median are uniformly insignificant, so there is no catch-up tendency to offset the widening dispersion. For *MED/IQR*, by contrast, the slope is negative and significant ($\beta_m \approx -0.8$), indicating conditional mean reversion that nonetheless coexists with σ -divergence. The attribution analysis shows that MaxT is the single dominant source of

divergence across all three measures ($R_m = 3.7, 6.5$ and 5.0 for the IQR , the median and MED/IQR). Beyond MaxT the drivers differ by dimension: Prec ($R_m = 5.1$) and Wind ($R_m = 3.0$) are the other main drivers for the level of risk (the median); Fire ($R_m = 3.1$) for the level of uncertainty (the IQR); and MinT and Prec ($R_m = 4.7$ and 3.7) for the level of relative risk (MED/IQR). The β -slopes reveal some mean reversion for MinT, Prec, and Hail, and significant β -divergence for Fire.

Second, the volatility of both the risk (median) and the uncertainty (IQR) indicators diverges across countries, more strongly for the median ($R_v = 5.1$) than for the IQR ($R_v = 1.6$). Unlike the level, the lead driver is now Fire ($R_v = 6.8/3.6$ for MED and IQR), followed by MaxT ($R_v = 3.3/1.9$); the remaining components contribute more weakly, and only MinT acts as a (mild) stabilizer ($R_v = 0.6/0.9$; $\beta_v = -1/-0.3$), though its role is outweighed by the diverging effects of all the other E3CI components. The volatility of their ratio (MED/IQR), by contrast, converges, and the result is supported by both σ - and β -convergence ($R_v = 0.6$; $\beta_v \approx -1$). The two findings are not in contrast: risk and uncertainty destabilize jointly and in a correlated fashion, so that their relative balance synchronizes across countries even as each component grows temporally more heterogeneous. The convergence of the ratio is driven by Prec, Wind and Fire ($R_v = 0.9$; $\beta_v = -0.7/-0.6/-1$); MaxT, i.e., the greenhouse fingerprint, pushes the ratio's volatility toward divergence here too ($R_v = 1.3$), but is outweighed by these converging, circulation-sensitive hazards. The risk-to-uncertainty ratio therefore shows increasingly synchronized fluctuations even as the volatilities of risk and uncertainty continue to diverge.

Our results show that the convergence of the volatility of the relative risk indicator is carried entirely by the circulation-sensitive hazards, i.e., Prec, Wind, and Fire. In contrast, the temperature channel works in the opposite direction. MaxT is a leading source of divergence in volatility across all measures, MED/IQR included, and MinT is at most neutral. The two forcings therefore play distinct roles. The thermodynamic, greenhouse-driven signal, whose clearest fingerprint is on maximum temperature, is associated with the persistent divergence in the absolute levels and volatility of risk and uncertainty. The dynamical signal, governed by large-scale circulation modes and, according to our results, likely by the NAO in particular, increasingly synchronizes the risk-to-uncertainty ratio fluctuations, so that the relative balance of risk and uncertainty volatility evolves in common even as their absolute levels continue to diverge.

5.5 Robustness

The cross-country results are robust along every dimension examined; we summarize here the extensive checks reported in the Online Appendix (Section A3, Tables A2, A3-A, B, C and Figures A9-A14). First, the cross-country configuration is insensitive to the choice of structural breakpoint: moving the break from 2010 to 2015, 88%, 95% and 75% of the countries retain their tercile band of the change for the MED , MED/IQR and IQR measures. Second, the principal-components structure is equally stable: eigenvalues, explained variance, and, wherever the eigenvalues are well separated, the loading vectors are essentially unchanged across breaks (Tucker congruences of 0.97-0.99 for the IQR). The one apparent exception, a swap of the first two MED components, is a labeling artifact of their near-degenerate eigenvalues rather than genuine instability. Accordingly, the component-level driver decomposition and the five-zone risk-taxonomy maps deliver the same hazard profiles, core memberships and, crucially, the same non-redundancy of the risk (MED) and uncertainty (IQR) geographies under both breaks. Third, the convergence analysis is unaffected by the estimation route (per-country GETS versus pooled Melly-Pons FE), the breakpoint date, and the aggregation rule for the relative

indicator. Risk and uncertainty diverge across countries under every configuration, with MaxT leading the level divergence and Fire the volatility divergence. In contrast, the volatility of the MED/IQR ratio remains the single systematically converging object. See the Online Appendix for details.

6 The economic effects of climate risk and uncertainty

Recent research shows that climate change affects European economic activity through persistent rather than purely transitory channels: severe weather destroys capital and infrastructure, reduces land and labor productivity and disrupts supply chains, while income losses, precautionary saving and displacement weaken demand (Gagliardi et al., 2022; Natoli, 2023; Parker, 2023; Bodenstein and Scaramucci, 2025; Usman et al., 2025; Chauvet et al., 2026). The magnitudes are substantial: projected losses reach 6.69% of GDP per capita by 2100 under RCP8.5 and persist even under Paris-consistent pathways (Kahn et al., 2021; Orlov et al., 2020; Chauvet et al., 2026), single extreme years can subtract up to 0.7% of GDP (Usman et al., 2025), and realized damages already amount to about €822 billion in EEA member countries over 1980-2024, one quarter incurred during 2021-2024 alone (Broeders and Mongelli, 2026). Because exposure and vulnerability vary geographically, climate change can also widen structural divergence across European economies (Kotz et al., 2022; Cortés Arbués et al., 2024; Caggese et al., 2025; Chauvet et al., 2026).

This literature focuses predominantly on the level of the hazard and its expected damage. Uncertainty is conceptually distinct. Under irreversibility and adjustment costs, greater dispersion of future states depresses decisions that are costly to reverse even when the expected hazard is unchanged, and induces firms to postpone investment and hiring (Bernanke, 1983; Dixit and Pindyck, 1994; Bloom, 2009; Bloom et al., 2018). We therefore examine GDP jointly with labor productivity, real wages, consumption, investment and the labor-market margins, since it is the configuration of responses across these margins, rather than any single response, that identifies the transmission mechanism. Europe may be particularly exposed to the uncertainty channel because of bank-dependent financing, relatively rigid labor markets, energy dependence and the absence of a common fiscal policy, which adds uncertainty about national fiscal capacity and risk sharing.

Previous evidence on climate uncertainty is focused on temperature variability, measured as dispersion around long-run climate conditions. Donadelli et al. (2020, 2022) document adverse effects of intra-annual temperature volatility on TFP growth in the United Kingdom and across a 114-country panel that includes Europe and North America (see also Kotz et al., 2021; Linsenmeier, 2023). Closest to our approach, Alessandri and Mumtaz (2022) show that ex-ante temperature uncertainty, identified from the conditional rather than the realized volatility in a stochastic-volatility panel VAR, lowers GDP growth and raises its volatility, together with significant declines in consumption and investment growth.

Our contribution extends this literature in three directions. First, we measure uncertainty as the conditional cross-sectional dispersion of the full distribution of extreme-weather outcomes, rather than temperature volatility alone, conditioning on anthropogenic forcing and natural climate oscillators. Second, we cover the main weather hazards, i.e., extreme maximum and minimum temperatures, precipitation, wind, droughts, wildfires, and hail. Third, by tracing responses across output, productivity, wages, consumption, investment and labor-market margins, we distinguish the expected-damage

channel of climate risk from the option-value and precautionary channels of climate uncertainty.

6.1 The econometric model

Because risk and uncertainty are the two conditional moments of the same underlying hazards, they share the same core drivers. Anthropogenic GHG forcing and global warming account for most of their common movement over time, shaping the severity gradient documented in Section 5, while natural oscillators contribute additional, partly distinct variation (Table 2; Figures 2-4). Including both measures in a single specification would therefore introduce substantial multicollinearity and blur the identification of the two channels. We consequently estimate them in separate specifications, so that each coefficient captures the total effect associated with its channel rather than a partial effect conditional on the other. This framework allows us to establish not only whether climate change reduces economic activity, but also how its effects propagate through production, factor allocation, and demand, and why their incidence differs across European countries.

Specifically, we use a dynamic panel regression with country fixed effects, including controls for macroeconomic and financial conditions. The baseline specification is

$$\Delta y_{j,t} = \alpha_j + \beta \Delta y_{j,t-1} + \gamma_s \widehat{CI}_{s,t} + \sum_i \delta_i x_{i,t} + u_{j,t}, \quad s = 1, \dots, 8, \quad (15)$$

where $\Delta y_{j,t}$ is the annual growth rate of the target macroeconomic variable (real GDP, for instance) in country j in period t , $\widehat{CI}_{s,t} \in \{MED_{s,t}, IQR_{s,t}, MED_{s,t}/IQR_{s,t}\}$, is the E3CI-based aggregate uncertainty or risk measure ($s = 1$) or the measure for one of its seven components (MaxT, MinT, Drought, Prec, Wind, Fire, and Hail; $s = 2, \dots, 8$), as delivered by the Melly-Pons fixed-effects estimator, α_j is the country fixed effect, $x_{i,t}$ is the generic macro-financial control, and $u_{j,t}$ is an i.i.d. residual. The controls account for economic uncertainty through the World Uncertainty Index for Europe (WUI Europe; Ahir et al., 2022), for geopolitical conditions through the Geopolitical Risk Index (GPR; Caldara and Iacoviello, 2022), for financial stress through the new CISS index (NCISS; Holló et al., 2012), and for the state of the business cycle through the CEPR ex-post coincident indicator for the euro area (REC; peak excluded), all expressed in annual terms. The climate risk and uncertainty indices enter as common factors across countries.

The macroeconomic impact analysis covers fourteen outcomes: the annual growth rates of real GDP and of its private consumption and investment components; of persons employed and of hours worked per employed person; of labor productivity, measured both by output per worker and by output per hour worked; and of the real product wage, the real consumption wage and the wedge between them; together with the change in the labor share of income, the change in the unemployment rate, the growth rate of the labor force and the entry margin in the labor market, defined as the excess of labor force growth over employment growth. Read jointly, these outcomes allow the transmission mechanism of climate risk and uncertainty to be traced as a whole, from the initial supply-side impact to its propagation to the demand side.

We also control for cross-country heterogeneity through asymmetric specifications, i.e.,

$$\Delta y_{j,t} = \alpha_j + \beta \Delta y_{j,t-1} + \gamma_s^+ \left(\widehat{CI}_{s,t} \times I_{j,t}^+ \right) + \gamma_s^- \left(\widehat{CI}_{s,t} \times I_{j,t}^- \right) + \sum_i \delta_i x_{i,t} + u_{j,t}, \quad s = 1, \dots, 8, \quad (16)$$

where $I_{j,t}^+$ ($I_{j,t}^-$) is an indicator variable equal to one when country j in period t exhibits an above-average (below-average) cross-sectional value of the partition variable of interest

at any given point in time, and zero otherwise, i.e., when the country is a relative leader (laggard) with respect to the criterion considered at a given point in time. The partitions capture a country’s commitment to adaptation policy, measured by the Notre-Dame Global Adaptation Index (ND-GAIN); to mitigation policy, proxied by the Germanwatch Climate Change Performance Index (CCPI); its institutional quality, assessed according to whether the country functions as a market economy consistent with EU standards; and its level of development, represented by real GDP per capita. The indicator is also used to control for heterogeneity arising from climatic exposure (above- or below-average land temperature) and from geography: for latitude, $I_{j,t}^+$ ($I_{j,t}^-$) equals one for Northern (Southern) European countries, and for longitude, for Western (Eastern) European ones. Details on the construction of these seven indicators are provided in the Online Appendix.

For robustness, the symmetric specification (15) and its risk counterparts are estimated by three versions of the fixed-effects estimator: the standard FE estimator, its bias-corrected version (BC-FE; Breitung et al., 2022), and an Autometrics-based version (GTS-FE; Hendry et al., 2008), in which country fixed effects are retained according to statistical significance to enhance efficiency. Given the sizable time dimension, the Nickell bias correction is expected to be redundant (Nickell, 1981; Alvarez and Arellano, 2003). BC-FE is therefore reported with robust standard errors for point comparison only. On the other hand, FE and GTS-FE are reported with Driscoll-Kraay standard errors and used for inference.

A caveat concerns the two-stage nature of the estimation. The climate measures entering (15)-(16) are fitted from the first-stage quantile models and are therefore generated regressors of the predictor type analyzed by Pagan (1984). Consistency of the second-stage coefficients is preserved, but the second-stage variance is not consistently estimated: it ignores the first-stage sampling error scaled by the squared coefficient, so conventional standard errors are generally too small. The problem vanishes under the null of no climate effect, since the spurious variance component is proportional to the squared coefficient (Pagan, 1984, Theorem 3). The two-stage procedure thus affects the width of confidence intervals and inferences about effect magnitudes, but not the decision to reject the absence of an effect. We nevertheless implement the Pagan IV correction, instrumenting the realized indicator with the fitted one for the conditional median and, where no observed counterpart exists, using the unconditional moments, the alternative first-stage construction or the AGGI indicator; because all instruments derive from the same underlying climate data, the IV estimates are read as diagnostics rather than as preferred point estimates.

As a general result, the estimated macroeconomic effects are strongly robust to the estimation strategy. With generated regressors of the predictor type, both the fixed-effects and IV estimators are consistent. Moreover, the Nickell bias is negligible given the sizable time dimension. The diagnostic evidence reported in the Online Appendix (Section A4 and Table A8) is consistent with this interpretation. Exogeneity of the estimated climate measures is not rejected in 87% of the cases, with a median p-value of 0.33, while the rejection frequency at the 1% level is equal to the nominal size of the test. Accordingly, the IV-corrected coefficients remain close to their uncorrected counterparts. The pooled Melly-Pons and per-country GETS measures also yield the same sign for almost every coefficient that is statistically significant under both approaches, providing no evidence that first-stage estimation error is driving the second-stage findings. The same considerations extend to the factor regressions in Section 7, where the climate measures enter in first differences. Given that the Melly-Pons measures combined with the GTS-FE estimator provide a consistent benchmark and allow for robust inference using Driscoll-Kraay standard errors, we use this specification as the benchmark for the

discussion of the macroeconomic effects that follows.

6.2 The effects of overall risk and uncertainty

We report a selection of the results for the symmetric models in Tables 4-7, contrasting the estimated impacts of climate uncertainty and climate risk on the various macroeconomic variables, using the Melly-Pons first-stage estimates for the climate indicators. Full details are reported in the Online Appendix (Tables A4-FS to A7-FS; A4-A to A4-D), where results for the per-country GETS first-stage estimates can also be found.

Table 4 reports estimates for the E3CI composite, which captures the economic effects of a broad deterioration in overall weather conditions. Climate risk and uncertainty operate through broadly similar channels, differing primarily in magnitude: for a typical annual change (one standard deviation), the effect of uncertainty is about twice as large as that of risk (absolute or relative). A typical increase in climate uncertainty reduces real GDP growth by 0.27%. The contraction is transmitted predominantly through productivity rather than labor utilization. Output per worker falls by 0.45% and output per hour by 0.39%, while neither employment (+0.08%) nor hours per worker (-0.01%) responds significantly. Thus, the decline in output is essentially accounted for by a deterioration in labor efficiency at broadly unchanged labor input. A contraction in real wages couples the productivity loss. The real product wage falls by 0.34%, about three-quarters of the decline in the marginal product of labor, with an unchanged labor share (+0.15%, not significant). The real wage wedge is likewise unchanged (+0.03%), indicating that changes in the relative price of consumption goods and output do not drive the adjustment. Taken together, these results suggest that climate uncertainty operates as a within-period loss of productive efficiency, through disrupted production and underutilized productive capacity, rather than through a substantial adjustment in the quantity of labor employed. The wage adjustment absorbs much of the productivity loss.

The effects on demand are consistent with this supply-side mechanism and also point to an additional precautionary response. With employment essentially unchanged, real labor income moves with the consumption wage, which falls by 0.24%. Consumption nevertheless declines by 0.31%, exceeding both the contraction in labor income and that in output. The implied relative response of consumption with respect to GDP is therefore 1.16 under uncertainty, compared with 1.07 under risk. This stronger response is consistent with a precautionary channel. An increase in climate uncertainty reduces current income and, conditional on that income loss, induces households to restrain further consumption in response to greater uncertainty about future conditions. Investment, by contrast, declines by 0.26%, broadly in line with output and without a statistically significant amplification. At the aggregate level, therefore, the estimates provide no evidence of either accelerator amplification or a systematic wait-and-see effect on investment. The latter emerges only under weaker institutional conditions, as shown by the asymmetry analysis discussed below.

Finally, the unemployment rate declines slightly (-0.06%) following the increase in uncertainty only, reflecting the combination of a small, statistically insignificant increase in employment and an insignificant response of labor-force participation, alongside a contraction in the entry margin. This pattern is consistent with the possibility that climate-related disruption generates some additional demand for labor through repair, reconstruction, adaptation, and replacement activities, while simultaneously discouraging entry into employment. This mechanism is most clearly visible for drought in the hazard-specific analysis discussed below. Yet we do not attach much weight to this mechanism, which we no longer discuss in the rest of the analysis.

6.2.1 The capacity gradient

Table 5 reports selected results from the asymmetric specifications, which condition the response on the capacity gradient: income level, institutional quality, and the intensity of adaptation and mitigation policies. As in the symmetric case, the impact and transmission patterns are similar across the uncertainty and risk indicators but differ in magnitude, as the uncertainty response is 1.5 to 2 times the risk response. Employment, hours per worker, and the wage wedge, as well as the other labor market variables reported in Table 4, do not respond to either channel for any component and are therefore not reported among the selected results. The capacity gradient is therefore a property of the absorption mechanism rather than of the particular moment of the climate distribution being conditioned on. The analysis shows unambiguously that countries with lower income, weaker institutions and less adaptation investment are disproportionately affected by both the uncertainty and risk channels.

In relatively high-income countries, an increase in climate uncertainty leaves productive efficiency essentially unaffected (-0.17%, not significant) and, consequently, output, consumption, investment and real wages do not respond either. In lower-income countries, the same shock lowers output per worker by 0.48%, and the efficiency loss fully propagates to GDP (-0.29%), consumption (-0.33%) and the real product wage (-0.36%). The climate-induced efficiency loss can therefore be hedged. Economies with the resources to insulate production from weather dispersion do so almost completely. A single exception is worth mentioning: the real consumption wage falls significantly in the high-income half under the risk channel (-0.14%), the only outcome on which relatively rich economies fail to insulate themselves, plausibly reflecting the pass-through of climate-driven food and energy prices to consumer prices, which no domestic capacity can fully offset.

Better institutions attenuate the efficiency loss without eliminating it, as output per worker still falls by 0.41% against 0.61% in the weaker half, but they radically change who bears it. Where institutions are strong, the real product wage absorbs 56% of the fall in the marginal product of labor (-0.23% against -0.41%); where they are weak, the wage falls by 0.98% (against -0.61%), an absorption rate above unity; similarly, the real consumption wage falls by 0.13% in the better half and 0.95% in the weaker half. Therefore, climate risk and uncertainty are not merely larger shocks in institutionally weak economies. They translate into a real wage cut that exceeds the underlying efficiency loss, consistent with a redistribution of income away from labor when contracts, enforcement, and social insurance are weak. Hence, the incidence of climate uncertainty and risk is an institutional outcome, not a technological one.

Investment displays the most striking asymmetry. It is unresponsive in the aggregate and in the better-institutions half (-0.01%), but contracts by 1.48% where institutions are weak, an implied response relative to GDP of 4.3 under uncertainty (4.6 under risk). The magnitude and the strong non-linearity point to irreversibility and financing frictions: where policy and contractual uncertainty compound climate uncertainty, and where credit is scarce, climate uncertainty is enough to postpone or cancel capital formation. That the amplification is, if anything, slightly larger under the risk channel suggests that a financial-accelerator mechanism, rather than option value alone, is at work: a pure wait-and-see effect would respond far more to dispersion than to the level of the hazard. Consumption behaves symmetrically. It contracts 1.6 times as much as GDP in the weak-institutions half, under both channels, indicating that households there cannot smooth the shock, a failure of consumption insurance, over and above the precautionary motive identified in the aggregate.

More adaptation halves the efficiency loss (output per worker -0.30% against -0.56%;

-0.18% against -0.29% under risk) and, under uncertainty, also reduces the pass-through to wages, from 93% to 72% (yet not under risk, 77% and 78% respectively). Adaptation capital, i.e., irrigation, flood defense, cooling, redundancy in networks, thus protects labor income specifically against the uncertainty of weather outcomes, the margin on which contingency and redundancy pay off, while offering little protection against a shift in the central tendency of the hazard, which requires structural rather than contingent adjustment.

Mitigation, by contrast, shows no asymmetry whatever in either channel. The two halves are statistically indistinguishable on every outcome (GDP -0.84% against -0.94%; output per hour -0.30% against -0.28%). This finding is consistent with mitigation acting as a global public good whose benefits do not accrue to the country undertaking it within the sample horizon. In contrast, adaptation is a private, domestic investment that pays off precisely in the states of the world our uncertainty measure describes.

Geography provides further evidence of heterogeneous effects of climate risk and uncertainty, but the asymmetry emerges only along the longitudinal (East-West) dimension. Splitting countries by latitude or by mean temperature yields no meaningful differences: a typical increase in climate uncertainty reduces output per worker by approximately 0.45% in both the northern and southern halves of the sample, while GDP, output per hour, and real wages are likewise affected to a similar extent across cooler and warmer countries. The East-West split, by contrast, closely mirrors the heterogeneity by institutional quality. In Eastern Europe, a typical increase in climate uncertainty reduces output per worker by 0.67%, compared with 0.30% in the West; the decline in the real product wage is 0.59% versus 0.20%, respectively. GDP growth falls by 0.39% in the East, compared with an insignificant 0.18% decline in the West, while consumption and investment show no significant response in Western Europe.

The East-West divide, however, should not be interpreted simply as a difference in adaptive or institutional capacity. The physical-geography analysis in Section 5 provides an important complementary perspective. As shown in Figure 5, many Eastern European countries lie in the first and fourth quadrants, placing them high along at least one of the two dimensions of climate severity and dispersion. These include Croatia, Bosnia and Herzegovina, Slovenia, Bulgaria, Romania, Montenegro, Ukraine, Belarus, Estonia, Latvia, Lithuania, Moldova, and Czechia. For these countries, therefore, exposure and vulnerability compound. Those experiencing a comparatively larger deterioration in typical weather conditions are also, on average, less able to absorb its economic consequences.

The implications are important. Under a business-as-usual scenario, climate risk and uncertainty are expected to increase further and heterogeneously across European countries. Consistent with Chauvet et al. (2026), our evidence therefore suggests that climate change is becoming a source of economic divergence rather than merely a common macroeconomic disturbance. A given increase in climate risk or uncertainty is absorbed more effectively where institutional and economic capacity is stronger and amplified where such capacity is weaker. Moreover, where higher physical exposure coincides with lower absorptive capacity, the cumulative effects can widen existing cross-country disparities along both margins. The fact that the adverse effects are attenuated, although not eliminated, among countries with stronger institutional capacity suggests that mitigation, adaptation, and resilience-enhancing policies can substantially reduce the macroeconomic consequences of climate change, even if they cannot fully offset them.

6.3 Attribution by hazard

In Table 6, we report selected results on the macroeconomic impact of physical climate risk and uncertainty hazard by hazard. This attribution analysis allows us to trace the overall effects reported in Table 4 back to their core determinants. As shown in the Table, the hazard-by-hazard analysis points to the same transmission channel uncovered by the aggregate analysis. For every component, the efficiency loss is the largest response in absolute value; real product wage absorbs the bulk of it; GDP and consumption follow; and investment never responds significantly. Differences between the uncertainty and risk channels concern magnitudes and, in some cases, the significance and the sign of the impact.

A typical increase in climate uncertainty, whichever component it originates from, leads to a loss of productive efficiency: largest for Hail (-0.63%) and Wind (-0.57%), sizable for MaxT (-0.25%) and Fire (-0.21%), and smaller for Prec (-0.11%); for Drought (-0.51%) and MinT (-0.07%) the point estimate is also negative but not significant. GDP then contracts roughly in proportion to the efficiency loss, and the real product wage absorbs most of it (between 60% and 80% of the fall in the marginal product of labor across components). The negative income effect transmits to the demand side. Still, only the contraction in consumption is significant, and only for Wind (-0.40%), MaxT (-0.16%), and Prec (-0.07%); investment is uniformly insignificant, confirming that the absence of amplification found in the aggregate is a property of each hazard rather than the result of offsetting component responses.

As for the E3CI index, the risk channel is about half as large for MaxT and Wind on output per worker (-0.14% and -0.26% against -0.25% and -0.57% under uncertainty). Yet for Prec, risk dominates dispersion by a factor of four (-0.49% against -0.11%); similarly for MinT, where the uncertainty channel is not significant, while the risk channel is active (-0.07% against -0.39%). For Fire, the two channels are comparable in size (-0.21% and -0.25%), while for Droughts they are similarly inactive. Hail is the only component in which the two channels have opposite signs: uncertainty exerts a negative effect, whereas higher risk is associated with faster growth in GDP, consumption, investment, productivity, and real wages. The latter responses possibly reflect a short-run stimulus from reconstruction and adaptive investment under relatively strong insurance coverage, consistent with evidence that extreme weather events can generate ambiguous or even positive short-run effects (Kotz et al., 2022; Caggese et al., 2025). We do not attach much weight to this latter finding, considering that the E3CI hail indicator might provide only a partial measure of the evolution of hail-related climate risk.

6.3.1 Asymmetric effects

Table 7 disaggregates the asymmetric analysis by individual hazard, retaining the three partitions that meaningfully discriminate across countries. Adaptation closely replicates income, while mitigation and latitude add no material asymmetry beyond what the aggregate analysis already identifies (see the Online Appendix for a full report of the results).

The transmission mechanism identified for the composite survives disaggregation. Across MaxT, Prec, Wind, Fire, and Hail, labor productivity shows the largest response, with real product wages absorbing much of the efficiency loss, followed by output and consumption. The direction of the asymmetry is also remarkably consistent across the three partitions. Yet, the relative importance of the uncertainty vs. the risk channel is hazard-specific rather than universal. Dispersion matters most for episodic and convective events, whose economic content lies largely in their unpredictability. The ratio of the uncertainty-to-risk response of output per worker is 2.2 for Wind and 1.7 for MaxT. By

contrast, risk dominates for more seasonal or positional hazards. The ratio falls to 0.23 for Prec, while for MinT, different from risk, the dispersion channel is largely inactive. Wildfires operate through both moments in broadly equal measure (0.87), whereas Hail is the only hazard for which the two channels have opposite signs.

The main asymmetry concerns institutional capacity and geography. Increases in either climate uncertainty or risk compress labor-productivity growth much more strongly in countries with weaker institutions and, more generally, in Eastern Europe. For example, Wind uncertainty lowers output per worker by roughly 1% in the institutionally weak group, against 0.50% in the strong group; the corresponding East-West effects are 0.73% and 0.44%. Fire and MaxT display the same pattern, while MinT dispersion, insignificant on average, produces a large productivity loss in the institutionally weak group. Output follows accordingly: Wind reduces GDP growth by 1.01% in the weak-institutions group, compared with 0.32% in the strong group, with similar asymmetries for Hail and Fire.

The key mechanism underlying this divergence is wage absorption. Where institutions are strong, the real product wage absorbs roughly half of the productivity loss, so the burden of the shock does not fall disproportionately on labor. Where institutions are weak, by contrast, wage absorption frequently exceeds unity: the real product wage falls by more than the underlying productivity loss for MaxT, Fire, precipitation, Hail, and Wind. This finding confirms the aggregate E3CI evidence that climate shocks are not purely technological disturbances. Their incidence depends on institutional capacity, bargaining arrangements, and workers' ability to insure against or resist adverse income shocks.

The same mechanism helps explain the larger consumption response in the vulnerable group. Under Wind uncertainty, consumption falls by 1.19% in the weak-institutions group, against 0.26% in the strong group; similarly large differences emerge for MaxT dispersion and Fire. Consumption therefore amplifies, rather than cushions, the productivity shock precisely where households have fewer buffers and more limited access to credit and insurance, consistent with a stronger precautionary channel.

Investment displays an even sharper institutional asymmetry. It contracts strongly under Wind, Fire, MaxT and Prec in countries with weak institutions, while the corresponding responses are generally small and insignificant in the strong-institutions group. The East-West divide points in the same direction, although less sharply. Income, however, reverses this ordering for some hazards, reflecting what there is to lose rather than a reduced capacity to absorb the shock, as investment responds most strongly in richer countries under Droughts, Hail, and Wind. In both configurations, the investment response is several times larger than the corresponding output response, consistent with accelerator amplification and a wait-and-postpone mechanism under irreversibility.

Taken together, the hazard-level evidence supports three conclusions. First, the transmission mechanism is robust to disaggregation. The adverse effects are not an artifact of the composite index or of a single dominant hazard, but reflect a common transmission process operating mainly through productive efficiency, real wages, and domestic demand rather than employment. Second, climate risk and uncertainty are not interchangeable. Risk reflects expected physical damage, whereas uncertainty adds option-value, factor-allocation, and precautionary channels. Their relative importance varies with the physical nature of the hazard, so relying on a single conditional moment would miss a hazard-specific dimension of climate change. Third, the economic incidence of climate shocks depends critically on absorptive capacity. Where institutions are weak, or income and adaptation are low, productivity losses translate into disproportionate wage and consumption contractions and, for several hazards, sharp declines in investment. The same weather shock can therefore generate a contained efficiency loss in some countries and a

compounded contraction in productivity, income, and demand in others, creating a channel through which physical climate change contributes to economic divergence across Europe.

6.4 Comparison with the literature

Chauvet et al. (2026, Table 7) provide a comprehensive benchmark, comparing their estimates with those of Felbermayr and Gröschl (2014), Orlov et al. (2020), García-León et al. (2021), Burke et al. (2015), Kahn et al. (2021), Casey et al. (2023), Cortés Arbués et al. (2024), Natoli (2023), Bodenstein and Scaramucci (2025), and Dietz and Lanz (2025). Across these studies, annual GDP effects range from -0.02% to -0.25% for aggregate climate conditions, -0.03% to -0.08% for extreme maximum temperatures, -0.01% to -0.40% for droughts, -0.03% to -0.18% for extreme wind, and -0.02% to -0.18% for extreme precipitation. Since these studies estimate the effects of realized weather conditions, the relevant comparison is with our risk estimates. Our estimates fall within the reported ranges in all cases and generally lie in their upper half, indicating relatively large effects that nevertheless remain consistent with the existing evidence. Extreme precipitation is the sole exception: our point estimate (-0.26%) lies slightly beyond the upper bound of the comparison range. However, it is imprecisely estimated and statistically insignificant, so this difference should not be over-interpreted.

Evidence against which to benchmark the uncertainty channel is much scarcer. The closest comparison is Alessandri and Mumtaz (2022), whose panel VAR with stochastic volatility implies an annual GDP contraction of about 0.3% following an increase in ex-ante temperature uncertainty, remarkably close to the 0.27% estimated here for a typical annual increase in aggregate climate uncertainty. The comparison is particularly notable given the different samples, frequencies, uncertainty measures, and identification strategies. It should nevertheless be interpreted as an order-of-magnitude comparison rather than a direct point estimate, since our measure captures the conditional dispersion of the full distribution of extreme-weather outcomes, not temperature volatility alone, and the two shocks are normalized differently. A second benchmark is Donadelli et al. (2022). For Europe, their panel-VAR estimates imply a peak decline in TFP growth of about 0.3-0.4% in response to a one-standard-deviation temperature volatility shock, with a fixed-effects panel coefficient of -0.21, marginally short of significance at the 10% level. Our estimates line up closely on the corresponding margin. A typical annual increase in the uncertainty of maximum temperature extremes lowers output per worker by 0.25%. In contrast, the composite E3CI uncertainty measure, which cumulates the dispersion of seven hazards beyond temperature dispersion, yields the larger 0.45% response.

Overall, our evidence confirms that climate uncertainty is economically sizable, comparable in magnitude to, and for several hazards potentially larger than, the expected-damage channel that has dominated the existing literature.

7 The financial effects of climate risk and uncertainty

Climate change uncertainty and risk can, in theory, affect all three core pricing channels: cash flows, through regulation, stranded assets, and financing costs; discount rates, through higher risk premia and macroeconomic volatility; and investment opportunities, through postponement and capital misallocation effects. By affecting aggregate investment, they simultaneously influence long-run growth expectations and risk premia across many sectors. They are therefore economy-wide rather than idiosyncratic factors. They are natural candidates to load onto existing risk factors, such as the Fama-French (FF)

factors (Fama and French, 2015), which proxy for how firms differ in their exposure to these channels.

Hence, we assess whether climate uncertainty and risk predict time variation in the European FF factor returns, i.e., whether the FF factors exhibit significant betas with respect to climate uncertainty and risk shocks. Our exercise is a time-series exposure and predictability exercise. Significant loadings are a necessary condition for climate uncertainty and risk to command a premium. Establishing the existence of such a premium, however, would require pricing a cross-section of expected returns, which is beyond the scope of this study. Our focus is therefore on estimating exposures and loadings, not on identifying or quantifying prices of risk. In this respect, the macroeconomic evidence of the previous section identifies a productivity channel shared by risk and uncertainty, whereby efficiency losses arise at unchanged labor input and are absorbed largely through real wages. The second-moment dimension adds two features to this mechanism: a consumption contraction that exceeds the income loss, consistent with precautionary saving, and an investment response amplified to about four times the output response when absorptive capacity is weak, consistent with the option value of waiting. If precautionary saving and the option value of waiting are economically important channels, we would therefore expect their financial counterpart to be reflected in the climate exposure of FF factors, with significant loadings concentrated particularly in the uncertainty measures.

Let F_{t+1} denote the generic factor return among MKT_{t+1} , SMB_{t+1} , HML_{t+1} , RMW_{t+1} , and CMA_{t+1} , where MKT is the market factor and SMB , HML , RMW , and CMA are the size, value, profitability, and investment factors, and let $u_{s,t+1}$ denote the generic climate shock, i.e., the first difference of the estimated uncertainty $\Delta IQR_{s,t+1}$, absolute risk $\Delta MED_{s,t+1}$, or relative risk $\Delta(MED_{s,t+1}/IQR_{s,t+1})$ measure, as delivered by the Melly-Pons fixed-effects estimator, for indicator s , $s = 1, \dots, 8$, rescaled to reflect a typical annual variation. As in the economic analysis, $s = 1$ refers to the E3CI-based aggregate measure, and $s = 2, \dots, 8$ to its seven components (MaxT, MinT, Drought, Prec, Wind, Fire, and Hail). As in the economic tables, the MinT betas in the median-based panels are reported with reversed sign, the climate-relevant movement for MinT being a decrease in cold extremes, so that positive loadings denote higher factor returns when climate risk increases. The empirical exposure equation is then

$$F_{t+1} = \alpha_F + \beta_{1,F} u_{s,t+1} + \sum_i \delta_{i,F} \Delta x_{i,t+1} + v_{F,t+1}, \quad (17)$$

where the $\Delta x_{i,t+1}$ are the controls for economic uncertainty (WUI Europe), geopolitical conditions (GPR), financial stress (NCISS), the state of the business cycle (the CEPR ex-post coincident indicator for the euro area, REC), the 10-year Bund real interest rate, and the Climate Policy Uncertainty index (CPU; Gavrilidis et al., 2026), all in first differences but for REC, which enters in levels, and $v_{F,t+1}$ is an i.i.d. zero-mean disturbance. Moreover, we also consider the model

$$F_{t+1} = \alpha_F + \beta_{1,F} u_{s,t+1} + \beta_{2,F} (u_{s,t+1} \times PA_{t+1}) + \sum_i \delta_{i,F} \Delta x_{i,t+1} + v_{F,t+1}, \quad (18)$$

where the interaction term $u_{s,t+1} \times PA_{t+1}$ captures a potential change arising after the Paris Agreement, i.e., PA is a dummy variable taking a unitary value from 2016 onward and zero otherwise. The Paris Agreement is the natural breakpoint for asset prices. By enshrining a long-term temperature goal shared by nearly 200 countries, it anchored expectations about the direction of climate policy. It became a common reference point for corporate planning and financial risk assessment, plausibly altering the market response to climate-related information thereafter (Broeders and Mongelli, 2026).

In estimation, we consider three sampling frequencies: annual, quarterly, and monthly. Because the climate risk and uncertainty measures are available only at the annual frequency, in the intra-year models we compute step functions by holding their annual value constant across quarters and months. Standard errors are clustered at the annual level, so that statistical inference appropriately reflects the effective sampling frequency of the climate variables. Stock returns and the macro-financial indicators are all available at the monthly frequency; only for the REC indicator do we compute a step function starting from the original quarterly values.

We report the estimated betas for the annual model, using the Melly-Pons estimates of the climate change risk and uncertainty measures in Table 8. We report the corresponding annual estimates obtained using the per-country GETS estimator in Table A9 in the Online Appendix. The Online Appendix also reports the quarterly and monthly models for both estimators (Tables A10 and A11). Given sample limitations, we treat the results as suggestive and give weight only to patterns that are coherent across measures, components, and frequencies. The latter is a specification check rather than independent evidence, since the intra-year regressions reuse the annual climate values and survive the estimator change documented in the robustness section.

Overall, the results provide weak but non-negligible evidence that physical climate uncertainty and risk predict time variation in the HML and SMB factor returns. In the fixed-effects estimates, neither the market factor MKT nor the investment factor CMA attains significance in any cell at the annual frequency; we return to CMA below, since its coefficients, though insignificant in Table 8, carry a systematic sign that the per-country estimates sharpen. For HML, the aggregate climate uncertainty measure $\Delta IQR_{s,t+1}$ loads negatively over the full sample for the Fire component (-0.066, 5% level), as does the relative risk measure (-0.053, 5% level); the Wind component is significant at the 10% level (-0.042). In the trivariate specification, the pre-Paris Agreement loading is significant and negative for Fire (-0.087), Wind (-0.069), and Drought (-0.065) for uncertainty; MaxT (-0.055) for absolute risk; and Fire (-0.053) for relative risk. Only the Fire and the MaxT loading on absolute risk are significant under both estimators, so we read the wildfires dimension as the driver of the result and the remaining components as corroborating rather than independent evidence.

The concentration in the uncertainty panel is consistent with value portfolios overweighting mature, capital-intensive and often brown industries (i.e., energy, utilities, heavy manufacturing). Climate uncertainty disproportionately threatens these sectors through stranded-asset risk, regulatory pressure and physical exposure, causing value to underperform growth when uncertainty rises. A competing channel would predict the opposite under realized physical risk: these sectors hold tangible assets, enjoy pricing power and inelastic demand, and are valued on near-term cash flows, which makes them resilient relative to long-duration growth firms. We find no support for it, since the risk measures load negatively wherever they are significant, as for MaxT and Fire, implying that the transition/policy/uncertainty channel dominates.

Additional indirect evidence in support of the uncertainty channel is provided by the minimum-temperature (MinT) indicator: under the risk-relevant sign convention adopted in the tables, its risk loading on the value spread is negative under both estimators (-0.055 in the per-country specification, where it is statistically significant), aligning MinT with the uniformly negative risk loadings found for MaxT and Fire. The interaction with the agreement indicator is never significant, so no significant post-agreement change can be singled out. The post-agreement effect, obtained as the sum of the two coefficients, is likewise never significant under either estimator. Moreover, when the pre-agreement loading is significant, the point estimate falls in magnitude (to -0.020 for Drought, -0.008

for Wind, and -0.035 for Fire) or even reverses in sign (+0.018 for MaxT). The exposure of the value spread to climate uncertainty is thus a robust finding for the first part of the sample. In contrast, the nine post-2015 annual observations are not informative enough to establish whether it survived the agreement.

SMB delivers a distinct pattern, though on weaker foundations than the value spread. Since the Paris Agreement, the size spread loads negatively on MaxT uncertainty (-0.043), a result that is fully robust across estimators. This finding contrasts with the various positive loadings observed for Drought uncertainty and risk, Wind risk, and the relative risk measures for Drought, MaxT, and Wind. Small firms are more financially constrained, less diversified, and more exposed to the physically and sectorally concentrated incidence of climate damage, as well as to funding and rollover risk; the size spread would therefore be expected to become more negative through both the uncertainty and risk channels. This expectation is confirmed only for MaxT uncertainty.

RMW, by contrast, does not deliver robust evidence. The full-sample loading is positive for Fire uncertainty (+0.037; +0.027 for relative risk), consistent with a rotation toward quality when climate uncertainty or realized risk increases, with high-profitability firms having stronger balance sheets, greater pricing power, and more operational flexibility to absorb cost and damage shocks. This channel is, however, not supported by the per-country GETS estimates, so the direction of the profitability exposure is indicative at best.

A further pattern concerns the investment factor. In the per-country GETS estimates, CMA loads positively on MinT uncertainty (+0.046) and, under the risk-relevant sign convention, negatively on MinT absolute risk (-0.039). The Melly-Pons coefficients carry the same signs (+0.019 and -0.025, respectively) but do not reach significance, and the sign pattern is uniform across estimators and frequencies. The two directions are those theory would suggest. Higher uncertainty raises the option value of waiting, so that aggressive investors are penalized, and the conservative-minus-aggressive factor earns higher returns during climate-uncertainty shocks. Under realized damage, by contrast, conservative firms are not mechanically rewarded, and firms investing in adaptation and resilience, i.e., aggressive in the investment sense, appear to be favored. The opposite loadings of the two conditional moments thus help disentangle the option-value and expected-damage channels for the temperature dimension. Given that significance is attained under one estimator only, we regard this as indicative.

Taken together, these findings align closely with the macroeconomic evidence. The significant loadings concentrate in the uncertainty panel rather than in the risk panel, and the signs of the estimated coefficients yield a consistent interpretation. In particular, the negative loading of the value spread on Fire and MaxT uncertainty and risk is the financial counterpart of the aggregate mechanism. The same forces that depress productive efficiency and irreversible capital outlays in the aggregate penalize portfolios with greater exposure to installed capital. The negative loading of the size spread on MaxT uncertainty, the positive loading of the investment factor on MinT uncertainty, and the positive loading of the profitability spread on Fire relative risk, although not robust across estimators, point in the same direction on the investor side, complementing the precautionary motive identified in consumption. We regard these patterns as directional corroboration rather than independent identification.

While the results are suggestive, also given these sample constraints, a full structural interpretation within a general-equilibrium asset pricing framework lies beyond the scope of the present paper and is left for future research.

8 Conclusions

Europe is warming at nearly twice the global rate, having already experienced an estimated $+2.4^{\circ}\text{C}$ increase in mean annual temperature relative to pre-industrial baselines, and the warming has accelerated markedly since 2010 (EEA, 2024a; Hansen et al., 2025; Rahmstorf and Foster, 2025; Chauvet et al., 2026). Against this background, we assess the distributional dynamics of extreme weather in Europe using quantile and panel quantile models within an automated GETS reduction strategy. We link the conditional distribution moments to their potential drivers, i.e., anthropogenic radiative forcing and the natural oscillators relevant to weather dynamics in Europe (AMO, NAO, ENSO, and solar irradiance), and provide new indicators of climate change risk (the conditional median) and climate change uncertainty (the conditional interquartile range), thereby attributing both moments of extreme weather behavior to their underlying anthropogenic and natural drivers.

Three findings emerge on the climate side. First, GHG concentrations drive both the level and the dispersion of extreme weather, confirming and further extending the conditional mean findings in Chauvet et al., 2026. We, however, uncover an important asymmetry in the role of natural forcing. Climate risk responds to anthropogenic forcing and to the natural oscillators alike: the AMO shifts the level of risk without widening its band; the NAO is the most pervasive cyclical driver, raising overall extreme-weather activity impacting maximum temperature, droughts, wind and wildfires conditions; ENSO stabilizes through maximum temperature and precipitation while destabilizing through droughts and wildfires; and solar irradiance acts mainly on the temperature and precipitation extremes. Climate uncertainty, by contrast, is predominantly anthropogenic: the IQR is driven mainly by GHGs, with a secondary cyclical contribution from the NAO. Wildfires are the sole hazard for which the natural drivers rival the anthropogenic signal in shaping uncertainty.

Second, the post-2010 acceleration is reflected in both moments, yet with distinct geographies. The largest median increases concentrate in Central-Eastern and Mediterranean Europe, i.e., the Iberian Peninsula, Italy, Germany, the Balkans and Ukraine. In contrast, the largest dispersion increases extend westward and northward, with the Netherlands, Belgium, Luxembourg and parts of Scandinavia and the Baltic recording large widenings without a matching rise in the median. The joint configuration is essentially two-dimensional, combining a severity gradient common to risk and uncertainty with an independent uncertainty gradient. An assessment built on the median alone would therefore be incomplete. The median is robust to the tails by construction while the IQR measures them. Hence, a climate generating more extremes without shifting its typical state is invisible to the level but visible to the dispersion, ocean thermal inertia muting the level along the maritime periphery. At the same time, circulation-driven variability widens, and orographic threshold regimes make the mountains, rather than the continental interior, the volatility core.

Third, the levels and volatilities of both risk and uncertainty diverge across European countries, with maximum temperature the dominant source of the level divergence and wildfires the source of the volatility divergence, whereas the volatility of their ratio converges, driven by circulation-sensitive hazards (precipitation, wind and Fire). The thermodynamic, greenhouse-driven signal thus underlies the persistent divergence in absolute risk and uncertainty, in line with heterogeneous country-specific warming, exposure and vulnerability. In contrast, the dynamical signal, i.e., large-scale circulation and likely the NAO in particular, increasingly synchronizes their relative balance.

Turning to transmission, our analysis provides, to the best of our knowledge, the first

comprehensive assessment of the uncertainty dimension of physical climate change across the full spectrum of weather hazards with explicit hazard attribution. Unlike risk, which operates through expected losses, uncertainty works through the option value of waiting and precautionary savings. Under irreversibility and adjustment costs, greater uncertainty about future climate conditions discourages decisions that are costly to reverse. We find evidence for both channels: uncertainty and realized hazard intensity depress economic activity, although their relative effects vary substantially across hazards.

A typical annual increase in climate uncertainty (one sample standard deviation of the annual change in the index) reduces real GDP growth by about 0.27%, primarily through productive efficiency (-0.45%), with real wages absorbing roughly three-quarters of the productivity loss. Labor utilization, the labor share, and the wage wedge remain unchanged, pointing to a within-period efficiency shock transmitted largely through the price of labor. Demand then contracts. Consumption falls by 0.31%, exceeding the responses of both labor income and output. Its response relative to GDP is elastic, consistent with a precautionary response beyond the income effect. Investment declines broadly in line with output but is not significant, providing no aggregate evidence of accelerator amplification or a systematic wait-and-see response. The effects of a typical annual increase in climate risk are about half as large throughout.

Risk and uncertainty nevertheless operate differently across hazards. Uncertainty dominates for episodic and convective events, whose economic impact lies largely in their unpredictability (maximum-temperature extremes and wind). Risk dominates for more seasonal or positional hazards (precipitation), and the uncertainty channel becomes inactive for minimum-temperature extremes. Wildfires operate through both moments in broadly equal measure, while hail is the only hazard for which the two channels have opposite signs. A single conditional moment would therefore miss an economically relevant and hazard-specific dimension of climate change.

The incidence of these effects depends more on absorptive capacity than on physical exposure alone. In high-income countries, the efficiency loss is statistically indistinguishable from zero, with no significant responses of output, consumption, investment, or wages. In lower-income countries, the same shock reduces output per worker by 0.48% and propagates to GDP, consumption, and wages. Institutional quality attenuates the productivity loss and, importantly, determines its incidence. Where institutions are strong, the real product wage absorbs about half of the productivity loss; where they are weak, wage absorption exceeds unity, so that labor bears more than the underlying efficiency loss. This asymmetry helps explain the stronger consumption contraction and the investment response that emerge under weak institutions. Geographical asymmetry is along the East-West dimension and closely mirrors the institutional divide, while latitude and mean temperature yield no meaningful differences.

The factor-exposure analysis provides suggestive evidence for the uncertainty channel. Significant loadings concentrate in the uncertainty rather than the risk measures, with signs broadly consistent with the aggregate mechanisms. In particular, the value spread loads negatively on Fire and MaxT uncertainty and risk, while the size spread loads negatively on MaxT uncertainty, the investment factor positively on MinT uncertainty, and the profitability spread positively on relative Fire risk. These patterns are consistent with greater climate vulnerability among portfolios exposed to smaller firms, more aggressive investment, weaker profitability, and installed capital. The evidence is suggestive rather than conclusive, however, and a structural interpretation within a general-equilibrium asset-pricing framework lies beyond the scope of the paper.

Two policy implications follow. First, adaptation and resilience-enhancing investment can attenuate the efficiency loss and, under uncertainty, reduce its pass-through to wages,

suggesting that contingency capacity and redundancy provide insurance against a wider range of future states. Mitigation, by contrast, benefits countries more uniformly, consistent with its public-good nature. Second, because hazard extremes affect countries differently according to their exposure and absorptive capacity, climate change is not merely a common macroeconomic disturbance but also a mechanism of economic divergence within Europe. Strengthening adaptive and institutional capacity can substantially attenuate this divergence, although it cannot fully eliminate the economic consequences of physical climate change.

A decade after the Paris Agreement, the case for precautionary and adaptive climate policies rests in part on the pervasiveness of deep climate uncertainty (Broeders and Mongelli, 2026). Our evidence that uncertainty is predominantly anthropogenic, rising, and economically costly in its own right, beyond expected damage, strengthens this case. When dispersion, rather than the expected level of a hazard, discourages irreversible investment, credible long-term policy commitments can reduce the option value of waiting and help preserve the window for an orderly transition. Distinguishing climate risk from its dispersion is therefore not merely a measurement refinement; it is directly relevant to designing the mitigation, adaptation, and restoration policy mix.

Declaration of Generative AI Use During the preparation of this manuscript, the authors used Claude Opus 5 (Anthropic) solely for permitted editorial and language-related purposes, including improving English language and style and checking grammar and syntax.

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Table 1: Augmented KPSS stationarity tests

Panel A: Extreme weather indicators, IQR					
	Level stat.	Linear trend stat.	Nonlin trend stat. (1)	Nonlin trend stat. (2)	Nonlin trend stat. (3)
E3CI	0.991	0.234	0.071	0.040	0.038
MaxT	1.104	0.139	0.042	0.043	0.038
MinT	0.432	0.063	0.058	0.033	0.032
Drought	0.275	0.056	0.047	0.044	0.034
Prec	0.639	0.149	0.048	0.038	0.034
Wind	0.579	0.188	0.077	0.042	0.033
Fire	0.808	0.165	0.044	0.033	0.033
Hail	0.313	0.132	0.042	0.023	0.024
Panel B: Extreme weather indicators, median					
	Level stat.	Linear trend stat.	Nonlin trend stat. (1)	Nonlin trend stat. (2)	Nonlin trend stat. (3)
E3CI	0.899	0.205	0.095	0.036	0.035
MaxT	1.097	0.265	0.099	0.040	0.040
MinT	0.731	0.074	0.062	0.025	0.041
Drought	0.097	0.061	0.054	0.037	0.036
Prec	0.806	0.127	0.039	0.040	0.035
Wind	0.379	0.131	0.093	0.050	0.039
Fire	0.825	0.172	0.078	0.034	0.035
Hail	0.526	0.076	0.055	0.040	0.039
Panel C: Extreme weather indicators, Median/IQR					
	Level stat.	Linear trend stat.	Nonlin trend stat. (1)	Nonlin trend stat. (2)	Nonlin trend stat. (3)
E3CI	0.949	0.138	0.094	0.037	0.036
MaxT	1.111	0.048	0.064	0.045	0.038
MinT	0.716	0.061	0.065	0.033	0.029
Drought	0.119	0.070	0.052	0.041	0.036
Prec	0.769	0.101	0.046	0.043	0.035
Wind	0.276	0.105	0.085	0.052	0.041
Fire	0.931	0.156	0.055	0.037	0.032
Hail	0.687	0.100	0.057	0.038	0.037
Panel D: Natural oscillators and AGGI					
	Level stat.	Linear trend stat.	Nonlin trend stat. (1)	Nonlin trend stat. (2)	Nonlin trend stat. (3)
AMO	0.971	0.129	0.054	0.033	0.025
NAO	0.216	0.095	0.059	0.038	0.035
SOI	0.367	0.045	0.038	0.035	0.033
SI	0.065	0.047	0.038	0.030	0.031
AGGI	1.199	0.135	0.138	0.055	0.033
Panel E: Critical values					
C.V. 1%	0.739	0.216	0.267	0.162	0.115
C.V. 5%	0.463	0.146	0.169	0.102	0.073

The Table reports the results of the augmented KPSS test by Becker et al. (2006). The series are the estimated unconditional cross-sectional IQR (Panel A), Median (Panel B), and Median/IQR ratio (Panel C) of the E3CI index and its seven components (MaxT, MinT, Drought, Prec, Wind, Fire, Hail), and for the level of the AMO, NAO, SOI, SI, and AGGI indexes (Panel D). Critical values of the test are also reported (Panel E).

Table 2: Melly and Pons (2025) minimum distance panel quantile estimation

Panel A												
Variable	E3CI				MaxT				MinT			
	Q25	Q50	Q75	IQR	Q25	Q50	Q75	IQR	Q25	Q50	Q75	IQR
sx0.5	-	-	-	-	-	-	-	-	-	-	-	-
sx1	0.082 (0.008)	0.057 (0.011)	0.057 (0.016)	-0.025 (0.018)	0.226 (0.027)	0.275 (0.033)	0.376 (0.044)	0.149 (0.052)	-	-	-	-
sx2	-	-	-	-	0.023 (0.022)	0.027 (0.022)	0.093 (0.026)	0.070 (0.035)	-	-	-	-
sx3	-	-	-	-	-	-	-	-	0.024 (0.010)	0.032 (0.013)	0.057 (0.017)	0.033* (0.020)
cx0.5	-0.149 (0.012)	-0.173 (0.015)	-0.227 (0.024)	-0.078 (0.027)	-0.816 (0.057)	-0.963 (0.059)	-1.262 (0.085)	-0.446 (0.102)	0.145 (0.015)	0.189 (0.026)	0.207 (0.035)	0.062 (0.038)
cx1	0.057 (0.007)	0.074 (0.009)	0.092 (0.011)	0.035 (0.013)	0.264 (0.017)	0.303 (0.025)	0.325 (0.033)	0.061* (0.037)	0.044 (0.011)	0.076 (0.011)	0.085 (0.013)	0.042 (0.017)
cx2	-	-	-	-	-	-	-	-	-0.034 (0.009)	-0.074 (0.012)	-0.124 (0.013)	-0.090 (0.016)
cx3	0.011* (0.006)	0.024 (0.005)	0.030 (0.006)	0.020 (0.008)	-	-	-	-	-0.059 (0.009)	-0.069 (0.011)	-0.075 (0.017)	-0.016 (0.019)
AMO	0.035 (0.005)	0.033 (0.007)	0.032 (0.007)	-0.003 (0.009)	0.021 (0.017)	0.060 (0.020)	0.034 (0.027)	0.013 (0.032)	-0.008 (0.011)	-0.002 (0.017)	0.018 (0.020)	0.026 (0.023)
NAO	0.017 (0.005)	0.032 (0.005)	0.043 (0.009)	0.026 (0.010)	0.034 (0.013)	0.058 (0.019)	0.040* (0.023)	0.006 (0.026)	-0.048 (0.007)	-0.059 (0.011)	-0.084 (0.015)	-0.036 (0.017)
SOI	-0.020 (0.003)	-0.017 (0.004)	-0.018 (0.006)	0.003 (0.006)	-0.033 (0.011)	-0.052 (0.010)	-0.089 (0.012)	-0.056 (0.016)	0.006 (0.006)	0.016* (0.009)	0.009 (0.010)	0.003 (0.011)
SI	0.003 (0.004)	0.007 (0.004)	0.006 (0.005)	0.004 (0.007)	0.081 (0.012)	0.096 (0.013)	0.112 (0.018)	0.031 (0.021)	-0.041 (0.007)	-0.046 (0.007)	-0.051 (0.008)	-0.009 (0.010)

Panel B												
Variable	Drought				Prec				Wind			
	Q25	Q50	Q75	IQR	Q25	Q50	Q75	IQR	Q25	Q50	Q75	IQR
sx0.5	-	-	-	-	-	-	-	-	-	-	-	-
sx1	-	-	-	-	-	-	-	-	-	-	-	-
sx2	-0.036 (0.016)	-0.051 (0.015)	-0.070 (0.015)	-0.033 (0.022)	-	-	-	-	-0.037 (0.010)	-0.048 (0.011)	-0.074 (0.013)	-0.037 (0.016)
sx3	-0.104 (0.016)	-0.121 (0.012)	-0.098 (0.013)	0.006 (0.021)	-	-	-	-	-	-	-	-
cx0.5	-	-	-	-	-0.067 (0.015)	-0.070 (0.014)	-0.109 (0.026)	-0.042 (0.029)	-	-	-	-
cx1	-	-	-	-	0.038 (0.008)	0.056 (0.011)	0.086 (0.013)	0.048 (0.015)	0.033 (0.012)	0.025 (0.011)	0.056 (0.015)	0.024 (0.019)
cx2	-	-	-	-	-0.019 (0.007)	-0.027 (0.008)	-0.021 (0.013)	-0.001 (0.015)	-	-	-	-
cx3	-	-	-	-	-	-	-	-	-	-	-	-
AMO	-0.014 (0.019)	-0.002 (0.016)	0.001 (0.020)	0.015 (0.028)	0.004 (0.011)	0.008 (0.012)	0.011 (0.016)	0.007 (0.019)	0.022 (0.008)	0.025 (0.010)	0.037 (0.010)	0.014 (0.013)
NAO	0.103 (0.020)	0.132 (0.020)	0.119 (0.021)	0.016 (0.029)	-0.036 (0.008)	-0.038 (0.007)	-0.036 (0.008)	-0.000 (0.012)	0.002 (0.009)	0.009 (0.009)	0.031 (0.013)	0.029* (0.016)
SOI	0.019 (0.015)	0.062 (0.013)	0.087 (0.014)	0.068 (0.020)	-0.026 (0.007)	-0.030 (0.007)	-0.028 (0.008)	-0.002 (0.011)	-0.002 (0.004)	-0.004 (0.006)	0.005 (0.010)	0.007 (0.011)
SI	-0.035 (0.011)	-0.052 (0.015)	-0.037 (0.012)	-0.002 (0.017)	0.016 (0.007)	0.022 (0.006)	0.022 (0.007)	0.006 (0.010)	-0.004 (0.006)	-0.011* (0.006)	-0.010 (0.010)	-0.006 (0.011)

Panel C												
Variable	Fire				Hail							
	Q25	Q50	Q75	IQR	Q25	Q50	Q75	IQR				
sx0.5	-	-	-	-	-	-	-	-				
sx1	0.055 (0.047)	0.257 (0.041)	0.539 (0.099)	0.484 (0.110)	-	-	-	-				
sx2	-	-	-	-	-0.002 (0.011)	-0.029 (0.009)	-0.032 (0.015)	-0.029 (0.018)				
sx3	-	-	-	-	-	-	-	-				
cx0.5	-0.172 (0.081)	-0.541 (0.073)	-1.151 (0.158)	-0.979 (0.178)	0.131 (0.026)	0.105 (0.021)	0.090 (0.024)	-0.041 (0.035)				
cx1	0.033 (0.030)	0.149 (0.029)	0.380 (0.065)	0.346 (0.071)	-	-	-	-				
cx2	0.021 (0.018)	0.086 (0.019)	0.167 (0.047)	0.146 (0.051)	0.033 (0.010)	0.046 (0.013)	0.066 (0.018)	0.033* (0.020)				
cx3	0.018 (0.012)	0.062 (0.012)	0.119 (0.029)	0.101 (0.031)	-	-	-	-				
AMO	0.001 (0.018)	-0.005 (0.017)	-0.027 (0.035)	-0.028 (0.039)	0.017 (0.017)	0.014 (0.016)	0.039 (0.019)	0.021 (0.025)				
NAO	0.037 (0.008)	0.063 (0.013)	0.112 (0.038)	0.075* (0.039)	-0.049 (0.011)	-0.035 (0.010)	-0.006 (0.011)	0.043 (0.016)				
SOI	0.001 (0.007)	0.014 (0.011)	0.083 (0.027)	0.082 (0.028)	0.001 (0.008)	0.004 (0.007)	-0.001 (0.008)	-0.002 (0.011)				
SI	-0.016 (0.007)	-0.014 (0.010)	0.022 (0.017)	0.038 (0.018)	-0.017 (0.008)	-0.018 (0.005)	-0.029 (0.008)	-0.012 (0.011)				

The Table reports the estimated coefficients from the Melly and Pons (2025) panel quantile regressions, implemented via GETS at the median, for the E3CI index and its components (MaxT, MinT, Drought, Prec, Wind, Fire, Hail). Standard errors are shown in round brackets. The conditioning set includes trigonometric polynomials in the AGGI (sxi, cxi), together with the AMO, NAO, and SOI oscillators, as well as solar irradiance (SI). The IQR standard errors are approximated as the square root of the sum of the sampling variances at the 25th and 75th quantiles. Bold figures denote statistical significance at the 10% level or better; those marked with an asterisk are significant at the 10% but not at the 5% level.

Table 3 Convergence analysis (per-country GETS) - Breakpoint 2010

Index	Sigma-convergence						Beta-convergence					
	IQR		MED		MED/IQR		IQR		MED		MED/IQR	
	m	v	m	v	m	v	m	v	m	v	m	v
E3CI	2.092	1.570	3.474	5.064	1.992	0.633	0.095 (0.230)	-0.244 (0.221)	0.011 (0.611)	-0.130 (0.658)	-0.787 (0.354)	-0.972 (0.071)
MaxT	3.652	1.909	6.487	3.269	5.014	1.275	0.589 (0.373)	0.440* (0.260)	-2.637 (1.972)	-2.186 (0.328)	-1.630 (0.723)	-1.248 (0.139)
MinT	1.277	0.904	2.067	0.610	4.651	1.035	-0.606 (0.130)	-0.331 (0.149)	-0.585* (0.308)	-0.997 (0.050)	-0.441 (0.465)	-0.379 (0.432)
Drought	1.381	1.514	2.134	1.324	1.988	1.220	-0.159 (0.227)	0.154 (0.486)	-0.362 (0.237)	-0.012 (0.171)	-0.557 (0.204)	-0.289 (0.179)
Prec	1.563	1.679	5.124	1.514	3.747	0.890	-0.196* (0.102)	-0.303 (0.218)	0.166 (0.655)	-0.183 (0.164)	0.081 (0.621)	-0.736 (0.101)
Wind	1.402	1.240	3.046	1.097	2.491	0.912	-0.098 (0.356)	-0.027 (0.118)	0.216 (0.320)	-0.246 (0.118)	-0.136 (0.301)	-0.602 (0.129)
Fire	3.059	3.580	1.510	6.767	1.185	0.911	0.919 (0.192)	0.735 (0.064)	0.134 (0.086)	0.132 (0.237)	-0.329 (0.203)	-0.975 (0.035)
Hail	1.488	1.778	2.124	1.605	1.666	1.147	-0.316* (0.177)	-0.153 (0.141)	-0.286 (0.375)	-0.427 (0.083)	-0.478 (0.323)	-0.163 (0.358)

The Table reports the convergence statistics for the E3CI index and its components, estimated using the per-country GETS estimator at the breakpoint 2010. Columns labeled m report the level statistic (ratio-of-means); columns labeled v the volatility statistic. For sigma-convergence, each entry is the post-to-pre standard deviation ratio (values below 1 indicate convergence). For beta-convergence, each entry is the slope of the post-minus-pre mean on the pre-break level, with the standard error in parentheses (a negative slope indicates convergence). Bold figures denote statistical significance at the 10% level or better; those marked with an asterisk are significant at the 10% but not at the 5% level.

Table 4: The economic impact of climate uncertainty, climate risk and relative climate risk: headline estimates (E3CI; GTS-FE)

	Climate uncertainty (IQR)			Climate risk (Median)			Relative climate risk (Median/IQR)		
	GTS-FE	GTS-FE-IV	Sig./8	GTS-FE	GTS-FE-IV	Sig./8	GTS-FE	GTS-FE-IV	Sig./8
Real GDP	-0.268 (0.086)	-0.241 (0.077)	6/8	-0.152 (0.050)	-0.136 (0.042)	6/8	-0.164 (0.076)	-0.179 (0.082)	4/8
Consumption	-0.310 (0.085)	-0.278 (0.089)	4/8	-0.163 (0.052)	-0.146 (0.042)	5/8	-0.206 (0.062)	-0.224 (0.067)	5/8
Investment	-0.258 (0.205)	-0.233 (0.186)	0/8	-0.168 (0.119)	-0.150 (0.109)	1/8	-0.196 (0.140)	-0.213 (0.158)	1/8
Output per worker	-0.448 (0.060)	-0.403 (0.067)	6/8	-0.248 (0.032)	-0.220 (0.028)	7/8	-0.308 (0.058)	-0.333 (0.065)	6/8
Output per hour	-0.394 (0.065)	-0.356 (0.080)	6/8	-0.227 (0.038)	-0.203 (0.045)	7/8	-0.304 (0.055)	-0.323 (0.075)	6/8
Real product wage	-0.341 (0.075)	-0.312 (0.095)	7/8	-0.175 (0.051)	-0.163 (0.044)	7/8	-0.248 (0.057)	-0.272 (0.067)	6/8
Real consumption wage	-0.244 (0.098)	-0.222 (0.102)	5/8	-0.119* (0.063)	-0.107* (0.056)	2/8	-0.162 (0.075)	-0.177 (0.084)	4/8
Real wage wedge	0.028 (0.036)	0.026 (0.033)	2/8	0.012 (0.024)	0.011 (0.022)	1/8	0.021 (0.030)	0.023 (0.032)	0/8
Labor share	0.145 (0.109)	0.130 (0.096)	1/8	0.107 (0.075)	0.098 (0.073)	0/8	0.130 (0.095)	0.145 (0.113)	0/8
Employment	0.077 (0.057)	0.069 (0.054)	0/8	0.036 (0.037)	0.031 (0.033)	0/8	0.056 (0.043)	0.061 (0.048)	0/8
Hours per worker	-0.007 (0.075)	-0.006 (0.067)	0/8	0.005 (0.050)	0.004 (0.045)	0/8	0.013 (0.061)	0.014 (0.067)	0/8
Unemployment rate	-0.059 (0.030)	-0.053* (0.030)	2/8	-0.024 (0.020)	-0.021 (0.018)	1/8	-0.035 (0.025)	-0.038 (0.027)	2/8
Labor force	0.014 (0.038)	0.013 (0.035)	1/8	0.013 (0.025)	0.012 (0.023)	0/8	0.022 (0.030)	0.024 (0.033)	0/8
Entry margin	-0.067 (0.034)	-0.061* (0.034)	2/8	-0.027 (0.023)	-0.024 (0.021)	1/8	-0.040 (0.028)	-0.044 (0.031)	2/8

Coefficients measure the impact of a typical annual change of the E3CI composite conditional moment on the annual growth rate (or change) of each variable, from the symmetric dynamic panel with country fixed effects, macro-financial controls and Driscoll–Kraay standard errors, estimated by Autometrics general-to-specific selection (GTS-FE) and by its Pagan / realized-measure IV counterpart (GTS-FE-IV); standard errors in parentheses. Sig./8 counts the E3CI components (of eight) with a significant GTS-FE coefficient. Bold figures denote significance at the 10% level or better; an asterisk marks significance at 10% but not 5%. Full results are in the Online Appendix. Table A4-A.

Table 5: Asymmetric incidence of climate uncertainty, climate risk and relative climate risk (E3CI; GTS-FE): capacity and geographic gradients

Panel A: climate uncertainty (IQR)												
	Income		Institutions		Adaptation		Mitigation		Latitude		Longitude	
	Higher	Lower	Better	Worse	More	Less	More	Less	North	South	West	East
Real GDP	-0.036 (0.167)	-0.293 (0.138)	-0.252* (0.144)	-0.343* (0.183)	-0.197* (0.112)	-0.303 (0.137)	-0.838 (0.331)	-0.943 (0.372)	-0.294 (0.111)	-0.227 (0.189)	-0.182 (0.150)	-0.390 (0.136)
Consumption	-0.094 (0.208)	-0.333 (0.134)	-0.262* (0.157)	-0.536 (0.230)	-0.235 (0.153)	-0.405 (0.145)	-0.925 (0.447)	-1.012 (0.406)	-0.324 (0.130)	-0.287 (0.189)	-0.212 (0.184)	-0.450 (0.138)
Investment	-0.458 (0.654)	-0.237 (0.233)	-0.011 (0.258)	-1.475 (0.576)	-0.255 (0.289)	-0.437 (0.309)	-0.801 (0.916)	-0.892 (0.894)	-0.338 (0.280)	-0.131 (0.299)	-0.014 (0.324)	-0.603 (0.376)
Output per worker	-0.167 (0.162)	-0.478 (0.097)	-0.413 (0.102)	-0.609 (0.140)	-0.300 (0.083)	-0.562 (0.098)	-0.720 (0.181)	-0.648 (0.184)	-0.446 (0.088)	-0.450 (0.132)	-0.299 (0.106)	-0.671 (0.111)
Output per hour	-0.147 (0.185)	-0.426 (0.064)	-0.367 (0.075)	-0.550 (0.176)	-0.301 (0.080)	-0.471 (0.088)	-0.301 (0.266)	-0.280 (0.249)	-0.411 (0.084)	-0.361 (0.098)	-0.284 (0.082)	-0.591 (0.103)
Real product wage	-0.143 (0.249)	-0.364 (0.097)	-0.232 (0.089)	-0.978 (0.291)	-0.215 (0.092)	-0.520 (0.150)	-0.437 (0.209)	-0.387* (0.199)	-0.358 (0.095)	-0.308 (0.131)	-0.198 (0.071)	-0.589 (0.175)
Real consumption wage	-0.173 (0.082)	-0.252* (0.131)	-0.132 (0.119)	-0.949 (0.334)	-0.210 (0.100)	-0.388 (0.182)	-0.384* (0.204)	-0.454* (0.232)	-0.273 (0.111)	-0.192 (0.174)	-0.139 (0.085)	-0.424* (0.241)
Panel B: climate risk (Median)												
	Income		Institutions		Adaptation		Mitigation		Latitude		Longitude	
	Higher	Lower	Better	Worse	More	Less	More	Less	North	South	West	East
Real GDP	-0.072 (0.105)	-0.161* (0.091)	-0.141 (0.091)	-0.218* (0.127)	-0.124 (0.076)	-0.159* (0.092)	-0.316 (0.255)	-0.331 (0.267)	-0.181 (0.070)	-0.107 (0.125)	-0.105 (0.095)	-0.216 (0.088)
Consumption	-0.097 (0.135)	-0.171* (0.090)	-0.133 (0.101)	-0.354 (0.162)	-0.160 (0.105)	-0.180* (0.092)	-0.417 (0.293)	-0.408 (0.267)	-0.200 (0.087)	-0.107 (0.115)	-0.126 (0.119)	-0.215 (0.095)
Investment	-0.324 (0.420)	-0.151 (0.130)	-0.032 (0.142)	-1.008 (0.388)	-0.204 (0.167)	-0.229 (0.189)	-0.414 (0.457)	-0.318 (0.446)	-0.271* (0.146)	-0.008 (0.164)	-0.027 (0.178)	-0.360 (0.224)
Output per worker	-0.127 (0.101)	-0.262 (0.060)	-0.226 (0.060)	-0.378 (0.091)	-0.182 (0.058)	-0.294 (0.058)	-0.259 (0.175)	-0.198 (0.170)	-0.257 (0.053)	-0.234 (0.083)	-0.176 (0.066)	-0.352 (0.059)
Output per hour	-0.108 (0.116)	-0.242 (0.036)	-0.204 (0.046)	-0.398 (0.091)	-0.175 (0.055)	-0.270 (0.051)	-0.157 (0.146)	-0.109 (0.137)	-0.236 (0.052)	-0.209 (0.055)	-0.165 (0.052)	-0.330 (0.047)
Real product wage	-0.030 (0.164)	-0.193 (0.065)	-0.116 (0.059)	-0.642 (0.183)	-0.142 (0.051)	-0.225 (0.102)	-0.045 (0.124)	-0.055 (0.106)	-0.197 (0.056)	-0.138* (0.084)	-0.123 (0.041)	-0.266 (0.117)
Real consumption wage	-0.135 (0.042)	-0.117 (0.087)	-0.054 (0.075)	-0.686 (0.222)	-0.146 (0.059)	-0.147 (0.125)	-0.027 (0.138)	-0.027 (0.122)	-0.154 (0.069)	-0.058 (0.109)	-0.094* (0.050)	-0.159 (0.161)
Panel C: relative climate risk (Median/IQR)												
	Income		Institutions		Adaptation		Mitigation		Latitude		Longitude	
	Higher	Lower	Better	Worse	More	Less	More	Less	North	South	West	East
Real GDP	-0.044 (0.149)	-0.177 (0.121)	-0.152 (0.126)	-0.223 (0.153)	-0.137 (0.105)	-0.160 (0.124)	-0.484 (0.412)	-0.482 (0.429)	-0.194* (0.102)	-0.118 (0.161)	-0.107 (0.125)	-0.245 (0.121)
Consumption	-0.096 (0.171)	-0.218 (0.110)	-0.170 (0.132)	-0.374 (0.160)	-0.177 (0.134)	-0.246 (0.110)	-0.632 (0.472)	-0.642 (0.428)	-0.246 (0.112)	-0.143 (0.146)	-0.147 (0.147)	-0.291 (0.113)
Investment	-0.194 (0.616)	-0.196 (0.166)	0.018 (0.184)	-1.202 (0.416)	-0.161 (0.227)	-0.321 (0.250)	-0.516 (0.739)	-0.463 (0.705)	-0.320* (0.191)	0.002 (0.200)	0.036 (0.228)	-0.522* (0.298)
Output per worker	-0.136 (0.138)	-0.327 (0.087)	-0.287 (0.090)	-0.401 (0.122)	-0.207 (0.080)	-0.385 (0.091)	-0.411 (0.277)	-0.322 (0.269)	-0.306 (0.083)	-0.311 (0.110)	-0.202 (0.091)	-0.467 (0.090)
Output per hour	-0.141 (0.145)	-0.325 (0.053)	-0.273 (0.063)	-0.483 (0.114)	-0.224 (0.072)	-0.385 (0.070)	-0.296 (0.218)	-0.244 (0.198)	-0.303 (0.069)	-0.305 (0.074)	-0.208 (0.067)	-0.479 (0.062)
Real product wage	-0.021 (0.201)	-0.275 (0.076)	-0.156 (0.070)	-0.777 (0.166)	-0.172 (0.063)	-0.365 (0.119)	-0.135 (0.188)	-0.167 (0.164)	-0.267 (0.065)	-0.213 (0.104)	-0.150 (0.050)	-0.424 (0.136)
Real consumption wage	-0.158 (0.060)	-0.162 (0.103)	-0.066 (0.088)	-0.779 (0.219)	-0.172 (0.074)	-0.236 (0.153)	-0.125 (0.201)	-0.146 (0.188)	-0.199 (0.082)	-0.096 (0.136)	-0.111* (0.062)	-0.251 (0.194)

Each pair of columns reports the impact of a typical annual change in the conditional moment of the climate indicator on the two halves of the country partition, from the asymmetric dynamic panel with Autometrics-selected country fixed effects, macro-financial controls and Driscoll–Kraay standard errors (GTS-FE estimator); standard errors in parentheses. Bold figures denote significance at the 10% level or better; an asterisk marks significance at 10% but not 5%. Countries are split at the annual cross-country mean of the Notre Dame Global Adaptation Index (Adaptation), of the CCPI-mm mitigation index (Mitigation), of real per capita GDP (Income), and by EU membership (Institutions) and geographical position (Latitude, Longitude). † For minimum-temperature extremes the climate-relevant movement is a decrease in cold extremes: the median-based panels are reported with reversed sign. Full results for all dependent variables, hazards and partitions are in Online Appendix Tables A6-A to A6-C.

Table 6: The anatomy of the composite: which hazards act through uncertainty and which through risk (GTS-FE)

	Climate uncertainty (IQR)					Climate risk (Median)				
	Real GDP	Consumption	Investment	Output per worker	Real product wage	Real GDP	Consumption	Investment	Output per worker	Real product wage
E3CI	-0.268 (0.086)	-0.310 (0.085)	-0.258 (0.205)	-0.448 (0.060)	-0.341 (0.075)	-0.152 (0.050)	-0.163 (0.052)	-0.168 (0.119)	-0.248 (0.032)	-0.175 (0.051)
MaxT	-0.137 (0.060)	-0.163 (0.048)	-0.169 (0.122)	-0.245 (0.044)	-0.164 (0.063)	-0.082 (0.033)	-0.094 (0.031)	-0.101 (0.073)	-0.144 (0.022)	-0.100 (0.031)
MinT †	-0.073 (0.190)	-0.261 (0.179)	-0.333 (0.484)	-0.065 (0.241)	-0.160 (0.138)	-0.291* (0.171)	-0.209 (0.157)	-0.233 (0.427)	-0.390 (0.192)	-0.198 (0.140)
Drought	-0.131 (0.421)	0.148 (0.489)	0.569 (0.867)	-0.510 (0.319)	-0.457* (0.268)	-0.199 (0.295)	-0.103 (0.357)	0.268 (0.376)	-0.380 (0.279)	-0.415* (0.232)
Prec	-0.058 (0.028)	-0.071 (0.026)	-0.073 (0.059)	-0.113 (0.019)	-0.083 (0.021)	-0.264 (0.204)	-0.419 (0.182)	-0.548 (0.382)	-0.487 (0.167)	-0.259 (0.120)
Wind	-0.424 (0.158)	-0.399* (0.204)	-0.368 (0.363)	-0.571 (0.110)	-0.385 (0.132)	-0.167* (0.086)	-0.162 (0.105)	-0.100 (0.188)	-0.262 (0.066)	-0.153 (0.068)
Fire	-0.116* (0.065)	-0.103 (0.068)	-0.156 (0.141)	-0.212 (0.044)	-0.130 (0.060)	-0.140 (0.068)	-0.124* (0.072)	-0.156 (0.145)	-0.245 (0.047)	-0.149 (0.064)
Hail	-0.434 (0.190)	-0.354 (0.226)	-0.070 (0.292)	-0.631 (0.132)	-0.334 (0.146)	0.367 (0.182)	0.559 (0.151)	0.653 (0.316)	0.522 (0.151)	0.461 (0.085)

The table reports, for the E3CI composite and each of its seven hazard components, the impact of a typical annual change in the conditional interquartile range (climate uncertainty) and in the conditional median (climate risk) on the annual growth rate of each variable, estimated by Autometrics general-to-specific selection (GTS-FE) with country fixed effects, macro-financial controls and Driscoll–Kraay standard errors; standard errors in parentheses. Bold figures denote significance at the 10% level or better; an asterisk marks significance at 10% but not 5%. † For minimum-temperature extremes the climate-relevant movement is a decrease in cold extremes: the climate risk columns are reported with reversed sign.

Table 7: Asymmetric incidence of climate uncertainty and climate risk, all outcomes and hazards (GTS-FE)

Climate uncertainty (IQR)							Climate risk (Median)						
Real GDP	Income		Institutions		Longitude		Income	Institutions		Longitude			
	Higher	Lower	Better	Worse	West	East		Higher	Lower	Better	Worse	West	East
E3CI	-0.036 (0.167)	-0.293 (0.138)	-0.252* (0.144)	-0.343* (0.183)	-0.182 (0.150)	-0.390 (0.136)	-0.072 (0.105)	-0.161* (0.091)	-0.141 (0.091)	-0.218* (0.127)	-0.105 (0.095)	-0.216 (0.088)	
MaxT	-0.081 (0.131)	-0.143 (0.091)	-0.148 (0.090)	-0.062 (0.165)	-0.109 (0.095)	-0.185* (0.101)	-0.042 (0.068)	-0.086 (0.057)	-0.079 (0.057)	-0.100 (0.088)	-0.059 (0.060)	-0.117 (0.058)	
MinT †	0.215 (0.292)	-0.104 (0.218)	0.062 (0.205)	-0.790 (0.367)	0.058 (0.190)	-0.284 (0.308)	-0.393 (0.264)	-0.280 (0.187)	-0.345* (0.180)	0.346 (0.375)	-0.283 (0.182)	-0.311 (0.272)	
Drought	-0.083 (0.467)	-0.136 (0.541)	-0.061 (0.553)	-0.510 (0.596)	-0.124 (0.543)	-0.142 (0.586)	0.178 (0.427)	-0.239 (0.329)	-0.170 (0.344)	-0.349 (0.455)	-0.127 (0.304)	-0.300 (0.388)	
Prec	-0.015 (0.056)	-0.063 (0.049)	-0.052 (0.050)	-0.089 (0.063)	-0.039 (0.051)	-0.084* (0.048)	-0.083 (0.450)	-0.284 (0.263)	-0.248 (0.281)	-0.347 (0.485)	-0.165 (0.282)	-0.412 (0.308)	
Wind	-0.189 (0.191)	-0.449* (0.252)	-0.320 (0.246)	-1.009 (0.306)	-0.271 (0.251)	-0.596 (0.268)	-0.103 (0.115)	-0.174 (0.151)	-0.121 (0.147)	-0.469 (0.148)	-0.103 (0.147)	-0.248 (0.153)	
Fire	-0.077 (0.115)	-0.120 (0.111)	-0.103 (0.112)	-0.221 (0.141)	-0.071 (0.120)	-0.173* (0.101)	-0.089 (0.121)	-0.145 (0.120)	-0.126 (0.120)	-0.246* (0.147)	-0.091 (0.127)	-0.204* (0.109)	
Hail	-0.322* (0.187)	-0.446 (0.298)	-0.411 (0.275)	-0.619* (0.372)	-0.372 (0.276)	-0.531* (0.306)	-0.095 (0.303)	0.414 (0.176)	0.344* (0.187)	0.460 (0.336)	0.265 (0.187)	0.504 (0.229)	
Consumption	Income		Institutions		Longitude		Income	Institutions		Longitude			
	Higher	Lower	Better	Worse	West	East		Higher	Lower	Better	Worse	West	East
E3CI	-0.094 (0.208)	-0.333 (0.134)	-0.262* (0.157)	-0.536 (0.230)	-0.212 (0.184)	-0.450 (0.138)	-0.097 (0.135)	-0.171* (0.090)	-0.133 (0.101)	-0.354 (0.162)	-0.126 (0.119)	-0.215 (0.095)	
MaxT	-0.077 (0.126)	-0.173* (0.089)	-0.161* (0.096)	-0.181 (0.186)	-0.138 (0.104)	-0.206* (0.110)	-0.047 (0.080)	-0.099* (0.055)	-0.083 (0.060)	-0.173* (0.104)	-0.074 (0.069)	-0.124 (0.060)	
MinT †	0.031 (0.264)	-0.291 (0.200)	-0.110 (0.188)	-1.099 (0.473)	-0.044 (0.193)	-0.610* (0.316)	-0.155 (0.257)	-0.215 (0.197)	-0.267 (0.203)	0.473 (0.551)	-0.241 (0.202)	-0.128 (0.321)	
Drought	0.300 (0.641)	0.132 (0.514)	0.162 (0.546)	0.066 (0.844)	0.170 (0.598)	0.112 (0.582)	-0.270 (0.490)	-0.085 (0.329)	-0.068 (0.385)	-0.295 (0.529)	-0.124 (0.398)	-0.073 (0.361)	
Prec	-0.025 (0.069)	-0.077* (0.046)	-0.060 (0.052)	-0.140* (0.076)	-0.053 (0.060)	-0.097 (0.048)	-0.028 (0.375)	-0.463* (0.261)	-0.363 (0.281)	-0.743 (0.592)	-0.278 (0.283)	-0.634* (0.330)	
Wind	-0.482 (0.390)	-0.390 (0.257)	-0.264 (0.280)	-1.187 (0.534)	-0.302 (0.353)	-0.510* (0.274)	-0.222 (0.204)	-0.156 (0.146)	-0.109 (0.158)	-0.511 (0.260)	-0.124 (0.190)	-0.210 (0.149)	
Fire	-0.027 (0.162)	-0.111 (0.111)	-0.076 (0.119)	-0.323 (0.199)	-0.068 (0.145)	-0.147 (0.111)	-0.060 (0.177)	-0.131 (0.119)	-0.095 (0.130)	-0.357* (0.207)	-0.090 (0.157)	-0.168 (0.117)	
Hail	-0.594 (0.402)	-0.327 (0.287)	-0.327 (0.305)	-0.575 (0.520)	-0.386 (0.365)	-0.303 (0.269)	0.185 (0.186)	0.598 (0.153)	0.497 (0.176)	0.811* (0.433)	0.406 (0.161)	0.771 (0.229)	
Investment	Income		Institutions		Longitude		Income	Institutions		Longitude			
	Higher	Lower	Better	Worse	West	East		Higher	Lower	Better	Worse	West	East
E3CI	-0.458 (0.654)	-0.237 (0.233)	-0.011 (0.258)	-1.475 (0.576)	-0.014 (0.324)	-0.603 (0.376)	-0.324 (0.420)	-0.151 (0.130)	-0.032 (0.142)	-1.008 (0.388)	-0.027 (0.178)	-0.360 (0.224)	
MaxT	-0.130 (0.494)	-0.174 (0.139)	-0.055 (0.156)	-1.000* (0.544)	-0.013 (0.192)	-0.432 (0.297)	-0.146 (0.262)	-0.096 (0.081)	-0.020 (0.085)	-0.671 (0.262)	-0.008 (0.105)	-0.237 (0.150)	
MinT †	2.169 (0.847)	-0.596 (0.546)	-0.115 (0.489)	-1.522 (1.220)	0.279 (0.439)	-1.287 (0.879)	-1.863* (0.992)	-0.057 (0.472)	-0.196 (0.452)	-0.668 (1.920)	-0.383 (0.435)	0.154 (1.040)	
Drought	-2.532* (1.457)	0.894 (0.884)	0.638 (0.753)	0.201 (2.219)	0.343 (0.737)	0.922 (1.497)	-2.244 (0.869)	0.535 (0.493)	0.259 (0.556)	0.318 (1.215)	-0.172 (0.622)	0.877 (0.753)	
Prec	-0.058 (0.233)	-0.075 (0.069)	-0.003 (0.066)	-0.481 (0.204)	0.017 (0.083)	-0.199 (0.123)	1.391 (1.538)	-0.754 (0.491)	-0.157 (0.394)	-2.802 (1.780)	0.235 (0.464)	-1.683* (1.009)	
Wind	-1.435* (0.788)	-0.255 (0.788)	-0.106 (0.319)	-1.863* (1.062)	-0.191 (0.407)	-0.568 (0.593)	-0.250 (0.665)	-0.084 (0.194)	-0.001 (0.152)	-0.736 (0.513)	0.067 (0.180)	-0.308 (0.334)	
Fire	-0.540 (0.369)	-0.113 (0.147)	-0.041 (0.159)	-1.108 (0.411)	-0.068 (0.191)	-0.267 (0.214)	-0.582 (0.441)	-0.109 (0.151)	-0.042 (0.172)	-1.079 (0.402)	-0.070 (0.208)	-0.269 (0.214)	
Hail	-1.778 (0.852)	0.117 (0.307)	0.028 (0.345)	-0.905 (1.186)	-0.095 (0.444)	-0.033 (0.491)	0.291 (0.871)	0.690* (0.387)	0.264 (0.446)	2.243 (0.848)	0.317 (0.515)	1.114* (0.644)	
Output per worker	Income		Institutions		Longitude		Income	Institutions		Longitude			
	Higher	Lower	Better	Worse	West	East		Higher	Lower	Better	Worse	West	East
E3CI	-0.167 (0.162)	-0.478 (0.097)	-0.413 (0.102)	-0.609 (0.140)	-0.299 (0.106)	-0.671 (0.111)	-0.127 (0.101)	-0.262 (0.060)	-0.226 (0.060)	-0.378 (0.091)	-0.176 (0.066)	-0.352 (0.059)	
MaxT	-0.147 (0.120)	-0.256 (0.066)	-0.241 (0.065)	-0.269 (0.116)	-0.177 (0.070)	-0.371 (0.074)	-0.079 (0.063)	-0.152 (0.039)	-0.136 (0.038)	-0.204 (0.064)	-0.104 (0.042)	-0.209 (0.040)	
MinT †	0.236 (0.262)	-0.097 (0.235)	0.067 (0.220)	-0.792 (0.359)	0.143 (0.183)	-0.399 (0.328)	-0.447* (0.256)	-0.384 (0.185)	-0.459 (0.182)	0.416 (0.356)	-0.386 (0.164)	-0.401 (0.298)	
Drought	-0.460 (0.422)	-0.515 (0.402)	-0.493 (0.397)	-0.603 (0.487)	-0.561 (0.376)	-0.428 (0.486)	-0.049 (0.391)	-0.416 (0.288)	-0.285 (0.298)	-0.892 (0.428)	-0.279 (0.268)	-0.521 (0.347)	

Prec	-0.053 (0.051)	-0.121 (0.034)	-0.103 (0.034)	-0.173 (0.046)	-0.078 (0.036)	-0.168 (0.034)	-0.233 (0.389)	-0.516 (0.207)	-0.438 (0.219)	-0.762 (0.353)	-0.270 (0.227)	-0.842 (0.235)
Wind	-0.213 (0.187)	-0.610 (0.161)	-0.499 (0.147)	-0.997 (0.259)	-0.436 (0.167)	-0.727 (0.191)	-0.117 (0.101)	-0.278 (0.097)	-0.228 (0.091)	-0.487 (0.125)	-0.206 (0.095)	-0.335 (0.105)
Fire	-0.153 (0.102)	-0.218 (0.079)	-0.185 (0.075)	-0.438 (0.137)	-0.159* (0.082)	-0.282 (0.076)	-0.164 (0.111)	-0.254 (0.084)	-0.214 (0.081)	-0.490 (0.137)	-0.183 (0.086)	-0.329 (0.079)
Hail	-0.329 (0.214)	-0.665 (0.181)	-0.634 (0.151)	-0.604* (0.350)	-0.595 (0.152)	-0.689 (0.232)	0.023 (0.299)	0.574 (0.160)	0.505 (0.173)	0.592 (0.241)	0.270* (0.153)	0.877 (0.225)
Real product wage	Income		Institutions		Longitude		Income		Institutions		Longitude	
	Higher	Lower	Better	Worse	West	East	Higher	Lower	Better	Worse	West	East
E3CI	-0.143 (0.249)	-0.364 (0.097)	-0.232 (0.089)	-0.978 (0.291)	-0.198 (0.071)	-0.589 (0.175)	-0.030 (0.164)	-0.193 (0.065)	-0.116 (0.059)	-0.642 (0.183)	-0.123 (0.041)	-0.266 (0.117)
MaxT	0.021 (0.158)	-0.187 (0.074)	-0.114* (0.063)	-0.605 (0.243)	-0.113 (0.044)	-0.279* (0.153)	-0.015 (0.096)	-0.111 (0.039)	-0.069 (0.035)	-0.392 (0.115)	-0.070 (0.025)	-0.160 (0.074)
MinT †	0.256 (0.377)	-0.203 (0.162)	-0.068 (0.151)	-0.764 (0.510)	-0.068 (0.134)	-0.318 (0.293)	-0.252 (0.445)	-0.192 (0.172)	-0.197 (0.160)	-0.218 (0.686)	-0.138 (0.110)	-0.386 (0.406)
Drought	-1.597 (0.589)	-0.332 (0.292)	-0.477 (0.290)	-0.308 (0.877)	-0.381 (0.272)	-0.603 (0.511)	-0.851 (0.521)	-0.366* (0.217)	-0.262 (0.230)	-1.442* (0.802)	-0.219 (0.220)	-0.721* (0.416)
Prec	-0.014 (0.078)	-0.092 (0.030)	-0.056 (0.026)	-0.286 (0.092)	-0.056 (0.020)	-0.132 (0.055)	0.286 (0.412)	-0.321* (0.170)	-0.126 (0.117)	-1.210* (0.712)	-0.201* (0.106)	-0.363 (0.335)
Wind	-0.360 (0.407)	-0.388 (0.135)	-0.295 (0.124)	-1.112* (0.571)	-0.314 (0.160)	-0.479* (0.258)	-0.135 (0.195)	-0.156 (0.071)	-0.125* (0.065)	-0.412* (0.244)	-0.160 (0.074)	-0.144 (0.124)
Fire	-0.132 (0.199)	-0.130* (0.078)	-0.070 (0.072)	-0.975 (0.266)	-0.092* (0.053)	-0.192 (0.141)	-0.148 (0.212)	-0.149* (0.082)	-0.078 (0.076)	-1.036 (0.325)	-0.109 (0.056)	-0.214 (0.151)
Hail	-0.518 (0.414)	-0.314 (0.144)	-0.293 (0.143)	-0.811 (0.710)	-0.346 (0.140)	-0.314 (0.288)	-0.055 (0.255)	0.517 (0.107)	0.282 (0.109)	1.307 (0.314)	0.192 (0.097)	0.885 (0.227)

Each pair of columns reports the impact of a typical annual change in the conditional moment of the climate indicator on the two halves of the country partition, from the asymmetric dynamic panel with Autometrics-selected country fixed effects, macro-financial controls and Driscoll–Kraay standard errors (GTS-FE estimator); standard errors in parentheses. Bold figures denote significance at the 10% level or better; an asterisk marks significance at 10% but not 5%. Countries are split at the annual cross-country mean of the Notre Dame Global Adaptation Index (Adaptation), of the CCPI-mm mitigation index (Mitigation), of real per capita GDP (Income), and by EU membership (Institutions) and geographical position (Latitude, Longitude). † For minimum-temperature extremes the climate-relevant movement is a decrease in cold extremes: the median-based panels are reported with reversed sign. Full results for all dependent variables, hazards and partitions are in Online Appendix Tables A6-A to A6-C.

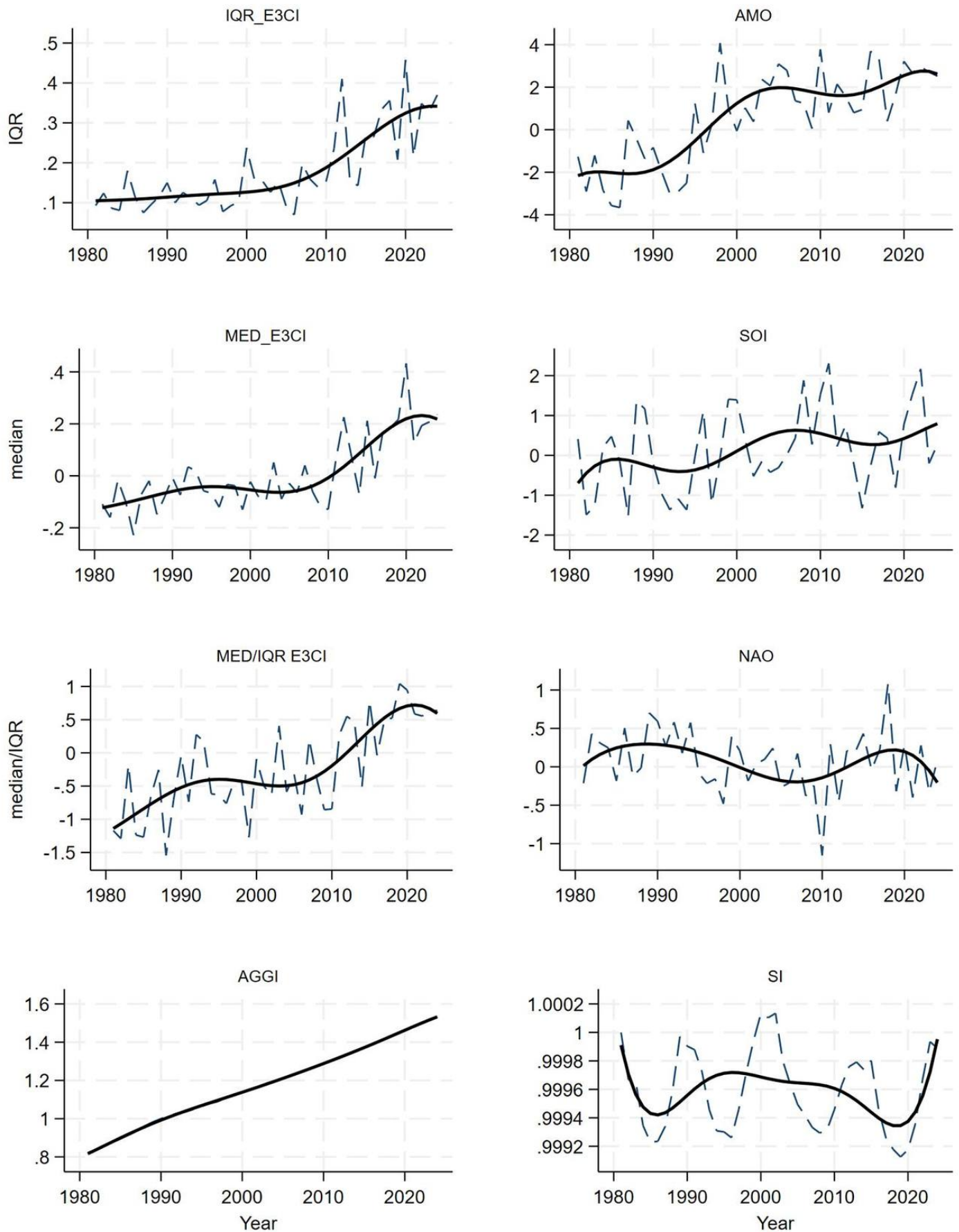
Table 8: Exposure of the FF risk factors to climate uncertainty and risk shocks (annual figures; Melly-Pons FE)

Panel A: Climate Uncertainty (IQR)															
Risk Factor	MKT			SMB			HML			RMW			CMA		
	fs	IQR	xPA	fs	IQR	xPA	fs	IQR	xPA	fs	IQR	xPA	fs	IQR	xPA
E3CI	0.024	0.033	-0.032	0.012	0.012	0.002	-0.027	-0.032	0.019	0.014	0.022	-0.027	-0.014	-0.011	-0.009
	(0.037)	(0.048)	(0.071)	(0.017)	(0.021)	(0.033)	(0.024)	(0.032)	(0.058)	(0.013)	(0.016)	(0.023)	(0.021)	(0.021)	(0.038)
	[0.346]	[0.350]	{0.001}	[0.214]	[0.214]	{0.014}	[0.178]	[0.181]	{-0.014}	[0.166]	[0.193]	{-0.005}	[0.149]	[0.151]	{-0.020}
MaxT	-0.012	-0.007	-0.012	-0.010	0.011	-0.054	0.012	0.013	-0.002	-0.008	-0.007	-0.002	-0.002	-0.010	0.022
	(0.029)	(0.041)	(0.046)	(0.019)	(0.024)	(0.025)	(0.024)	(0.037)	(0.046)	(0.015)	(0.022)	(0.022)	(0.020)	(0.026)	(0.037)
	[0.340]	[0.340]	{-0.019}	[0.210]	[0.290]	{-0.043}	[0.159]	[0.159]	{0.011}	[0.149]	[0.150]	{-0.009}	[0.137]	[0.148]	{0.012}
MinT	-0.007	-0.015	0.036	-0.015	-0.019	0.019	0.022	0.018	0.017	-0.017	-0.024	0.029	0.019	0.014	0.019
	(0.040)	(0.041)	(0.063)	(0.016)	(0.019)	(0.028)	(0.032)	(0.042)	(0.063)	(0.013)	(0.017)	(0.024)	(0.024)	(0.029)	(0.042)
	[0.338]	[0.343]	{0.021}	[0.222]	[0.229]	{0.000}	[0.172]	[0.174]	{0.035}	[0.189]	[0.217]	{0.005}	[0.163]	[0.168]	{0.034}
Drought	0.026	0.026	-0.000	0.006	-0.014	0.050	-0.047	-0.065*	0.044	0.010	0.015	-0.012	-0.019	-0.018	-0.003
	(0.038)	(0.052)	(0.057)	(0.022)	(0.027)	(0.030)	(0.028)	(0.038)	(0.052)	(0.015)	(0.021)	(0.021)	(0.021)	(0.028)	(0.044)
	[0.347]	[0.347]	{0.026}	[0.204]	[0.270]	{0.036}	[0.222]	[0.244]	{-0.020}	[0.153]	[0.160]	{0.003}	[0.159]	[0.160]	{-0.021}
Prec	-0.001	-0.007	0.048	-0.003	-0.003	0.001	-0.027	-0.033	0.049	-0.009	-0.010	0.004	-0.014	-0.018	0.032
	(0.030)	(0.032)	(0.084)	(0.016)	(0.016)	(0.060)	(0.027)	(0.031)	(0.061)	(0.014)	(0.017)	(0.033)	(0.020)	(0.023)	(0.048)
	[0.337]	[0.342]	{0.041}	[0.202]	[0.202]	{-0.002}	[0.187]	[0.198]	{0.016}	[0.155]	[0.156]	{-0.006}	[0.155]	[0.165]	{0.014}
Wind	0.024	0.039	-0.033	0.020	0.016	0.011	-0.042*	-0.069*	0.061	0.011	0.024	-0.030	-0.021	-0.028	0.016
	(0.032)	(0.050)	(0.058)	(0.015)	(0.021)	(0.028)	(0.024)	(0.036)	(0.051)	(0.011)	(0.016)	(0.021)	(0.021)	(0.028)	(0.038)
	[0.348]	[0.353]	{0.006}	[0.241]	[0.243]	{0.026}	[0.222]	[0.260]	{-0.008}	[0.159]	[0.199]	{-0.006}	[0.169]	[0.174]	{-0.012}
Fire	0.002	0.008	-0.016	0.007	0.006	0.001	-0.066	-0.087	0.052	0.019	0.037	-0.045	-0.034	-0.033	-0.002
	(0.042)	(0.045)	(0.064)	(0.017)	(0.023)	(0.033)	(0.026)	(0.032)	(0.053)	(0.014)	(0.013)	(0.020)	(0.022)	(0.030)	(0.047)
	[0.337]	[0.338]	{-0.008}	[0.204]	[0.204]	{0.007}	[0.287]	[0.312]	{-0.035}	[0.185]	[0.265]	{-0.008}	[0.205]	[0.205]	{-0.035}
Hail	0.030	0.048	-0.046	0.019	0.017	0.004	-0.032	-0.046	0.037	0.008	0.019	-0.028	-0.020	-0.024	0.012
	(0.033)	(0.048)	(0.057)	(0.014)	(0.019)	(0.028)	(0.025)	(0.040)	(0.059)	(0.011)	(0.018)	(0.023)	(0.021)	(0.027)	(0.038)
	[0.354]	[0.364]	{0.001}	[0.235]	[0.236]	{0.021}	[0.192]	[0.205]	{-0.009}	[0.149]	[0.181]	{-0.009}	[0.166]	[0.169]	{-0.012}
Panel B: Climate Risk (Median)															
Risk Factor	MKT			SMB			HML			RMW			CMA		
	fs	MED	xPA	fs	MED	xPA	fs	MED	xPA	fs	MED	xPA	fs	MED	xPA
E3CI	0.022	0.033	-0.040	0.010	0.017	-0.025	-0.025	-0.036	0.036	-0.003	0.005	-0.028	-0.018	-0.022	0.014
	(0.031)	(0.043)	(0.073)	(0.012)	(0.018)	(0.030)	(0.027)	(0.035)	(0.063)	(0.015)	(0.024)	(0.033)	(0.022)	(0.024)	(0.043)
	[0.347]	[0.353]	{-0.007}	[0.212]	[0.224]	{-0.008}	[0.183]	[0.192]	{0.000}	[0.140]	[0.165]	{-0.023}	[0.166]	[0.169]	{-0.009}
MaxT	0.001	0.005	-0.016	-0.003	0.008	-0.044	-0.038	-0.055*	0.073	0.004	0.013	-0.037	-0.026	-0.036	0.042
	(0.031)	(0.035)	(0.062)	(0.016)	(0.019)	(0.036)	(0.025)	(0.030)	(0.053)	(0.017)	(0.022)	(0.027)	(0.019)	(0.022)	(0.040)
	[0.337]	[0.338]	{-0.011}	[0.202]	[0.236]	{-0.036}	[0.222]	[0.261]	{0.018}	[0.142]	[0.186]	{-0.024}	[0.197]	[0.222]	{0.007}
MinT †	0.014	0.022	-0.027	0.006	0.014	-0.027	-0.027	-0.030	0.010	0.016	0.026	-0.033	-0.025	-0.024	-0.003
	(0.039)	(0.045)	(0.065)	(0.016)	(0.021)	(0.029)	(0.029)	(0.040)	(0.069)	(0.014)	(0.018)	(0.026)	(0.022)	(0.027)	(0.044)
	[0.341]	[0.343]	{-0.005}	[0.205]	[0.219]	{-0.013}	[0.181]	[0.182]	{-0.020}	[0.180]	[0.220]	{-0.008}	[0.181]	[0.181]	{-0.027}
Drought	0.022	0.036	-0.034	0.032*	0.034	-0.006	-0.027	-0.033	0.016	0.011	0.020	-0.023	-0.013	-0.010	-0.008
	(0.035)	(0.050)	(0.059)	(0.017)	(0.025)	(0.030)	(0.026)	(0.044)	(0.057)	(0.012)	(0.019)	(0.023)	(0.021)	(0.030)	(0.039)
	[0.346]	[0.351]	{0.003}	[0.291]	[0.292]	{0.028}	[0.180]	[0.183]	{-0.017}	[0.157]	[0.180]	{-0.003}	[0.150]	[0.151]	{-0.018}
Prec	-0.024	-0.036	0.031	-0.021	-0.018	-0.008	0.029	0.036	-0.020	-0.015	-0.025	0.028	0.014	0.012	0.007
	(0.036)	(0.046)	(0.055)	(0.018)	(0.022)	(0.030)	(0.028)	(0.044)	(0.058)	(0.012)	(0.017)	(0.022)	(0.023)	(0.031)	(0.042)
	[0.346]	[0.351]	{-0.004}	[0.236]	[0.238]	{-0.026}	[0.180]	[0.184]	{0.016}	[0.169]	[0.202]	{0.003}	[0.150]	[0.151]	{0.019}
Wind	0.025	0.031	-0.014	0.009	-0.012	0.053*	-0.019	-0.029	0.025	-0.011	-0.018	0.017	-0.008	-0.012	0.010
	(0.030)	(0.046)	(0.059)	(0.017)	(0.025)	(0.031)	(0.034)	(0.051)	(0.063)	(0.013)	(0.020)	(0.026)	(0.025)	(0.037)	(0.048)
	[0.352]	[0.353]	{0.017}	[0.211]	[0.281]	{0.041}	[0.171]	[0.178]	{-0.004}	[0.166]	[0.180]	{-0.001}	[0.142]	[0.145]	{-0.002}
Fire	0.010	0.024	-0.038	0.015	0.021	-0.016	-0.039	-0.046	0.021	0.011	0.025	-0.039	-0.021	-0.018	-0.009
	(0.039)	(0.047)	(0.064)	(0.016)	(0.023)	(0.032)	(0.027)	(0.040)	(0.059)	(0.011)	(0.015)	(0.023)	(0.021)	(0.027)	(0.042)
	[0.339]	[0.345]	{-0.015}	[0.221]	[0.227]	{0.004}	[0.210]	[0.214]	{-0.025}	[0.156]	[0.217]	{-0.014}	[0.170]	[0.171]	{-0.027}
Hail	-0.004	-0.009	0.027	-0.018	-0.024	0.035	0.025	0.034	-0.045	-0.020	-0.027	0.037	0.014	0.016	-0.014
	(0.039)	(0.041)	(0.072)	(0.019)	(0.022)	(0.036)	(0.028)	(0.034)	(0.071)	(0.013)	(0.016)	(0.029)	(0.023)	(0.026)	(0.048)
	[0.337]	[0.340]	{0.018}	[0.230]	[0.249]	{0.010}	[0.177]	[0.190]	{-0.011}	[0.201]	[0.240]	{0.011}	[0.150]	[0.153]	{0.003}
Panel C: Relative Climate Risk (Median/IQR)															
Risk Factor	MKT			SMB			HML			RMW			CMA		
	fs	MED/IQR	xPA	fs	MED/IQR	xPA	fs	MED/IQR	xPA	fs	MED/IQR	xPA	fs	MED/IQR	xPA
E3CI	0.030	0.030	-0.007	0.010	0.012	-0.055	-0.015	-0.015	0.016	-0.004	-0.003	-0.048	-0.012	-0.012	0.024
	(0.036)	(0.038)	(0.154)	(0.013)	(0.014)	(0.108)	(0.026)	(0.026)	(0.139)	(0.017)	(0.019)	(0.057)	(0.019)	(0.019)	(0.122)
	[0.358]	[0.358]	{0.023}	[0.214]	[0.222]	{-0.044}	[0.164]	[0.164]	{0.000}	[0.142]	[0.152]	{-0.051}	[0.150]	[0.151]	{0.012}
MaxT	0.006	0.003	0.062	-0.001	-0.007	0.123*	-0.010	-0.010	-0.006	-0.008	-0.009	0.013	-0.012	-0.010	-0.038
	(0.024)	(0.025)	(0.145)	(0.014)	(0.015)	(0.061)	(0.023)	(0.024)	(0.122)	(0.014)	(0.016)	(0.048)	(0.016)	(0.015)	(0.108)
	[0.338]	[0.341]	{0.065}	[0.201]	[0.262]	{0.116*}	[0.158]	[0.158]	{-0.015}	[0.153]	[0.154]	{0.004}	[0.150]	[0.155]	{-0.047}
MinT †	0.014	0.026	-0.035	0.006	0.016	-0.028	-0.018	-0.029	0.033	0.014	0.031*	-0.053	-0.019	-0.024	0.012
	(0.040)	(0.047)	(0.068)	(0.016)	(0.022)	(0.033)	(0.028)	(0.040)	(0.072)	(0.013)	(0.016)	(0.025)	(0.023)	(0.030)	(0.046)
	[0.341]	[0.345]	{-0.008}	[0.205]	[0.220]	{-0.013}	[0.166]	[0.174]	{0.004}	[0.169]	[0.266]	{-0.022}	[0.165]	[0.167]	{-0.012}

Drought	0.025	0.038	-0.038	0.031*	0.033	-0.004	-0.025	-0.028	0.010	0.009	0.017	-0.020	-0.011	-0.008	-0.010
	(0.035)	(0.047)	(0.058)	(0.017)	(0.023)	(0.030)	(0.026)	(0.040)	(0.055)	(0.012)	(0.018)	(0.023)	(0.021)	(0.028)	(0.039)
	[0.348]	[0.355]	{0.000}	[0.292]	[0.293]	{0.029}	[0.176]	[0.177]	{-0.018}	[0.152]	[0.171]	{-0.004}	[0.146]	[0.148]	{-0.018}
Prec	-0.028	-0.034	0.031	-0.022	-0.019	-0.013	0.036	0.040	-0.019	-0.019	-0.024	0.027	0.018	0.016	0.007
	(0.036)	(0.040)	(0.060)	(0.018)	(0.020)	(0.032)	(0.029)	(0.037)	(0.057)	(0.012)	(0.015)	(0.021)	(0.023)	(0.028)	(0.045)
	[0.350]	[0.353]	{-0.003}	[0.243]	[0.246]	{-0.033}	[0.200]	[0.203]	{0.021}	[0.191]	[0.217]	{0.003}	[0.158]	[0.158]	{0.023}
Wind	0.029	0.029	-0.000	0.001	-0.013	0.074*	-0.022	-0.028	0.032	-0.011	-0.014	0.016	-0.006	-0.011	0.022
	(0.034)	(0.043)	(0.081)	(0.019)	(0.020)	(0.037)	(0.036)	(0.047)	(0.075)	(0.014)	(0.017)	(0.033)	(0.027)	(0.034)	(0.055)
	[0.355]	[0.355]	{0.029}	[0.201]	[0.286]	{0.060*}	[0.175]	[0.182]	{0.004}	[0.162]	[0.170]	{0.002}	[0.140]	[0.146]	{0.011}
Fire	0.022	0.021	-0.044	0.013	0.013	0.130	-0.053	-0.053	-0.147	0.027	0.027	0.011	-0.025	-0.025	-0.111
	(0.028)	(0.029)	(0.246)	(0.016)	(0.017)	(0.128)	(0.021)	(0.022)	(0.170)	(0.008)	(0.008)	(0.060)	(0.020)	(0.020)	(0.147)
	[0.347]	[0.347]	{-0.023}	[0.220]	[0.238]	{0.144}	[0.279]	[0.289]	{-0.200}	[0.286]	[0.287]	{0.039}	[0.190]	[0.201]	{-0.136}
Hail	-0.011	-0.012	0.013	-0.013	-0.016	0.039	0.024	0.027	-0.034	-0.019	-0.022	0.031	0.015	0.015	-0.003
	(0.036)	(0.038)	(0.084)	(0.018)	(0.020)	(0.040)	(0.028)	(0.031)	(0.084)	(0.012)	(0.014)	(0.037)	(0.020)	(0.022)	(0.058)
	[0.339]	[0.340]	{0.001}	[0.218]	[0.233]	{0.023}	[0.178]	[0.183]	{-0.007}	[0.206]	[0.223]	{0.009}	[0.155]	[0.156]	{0.013}

The Table reports the estimated betas from the factor-exposure regressions, assessing how climate uncertainty and risk shocks load onto the Fama-French risk factors (MKT, SMB, HML, RMW, CMA). The conditioning variables include the E3CI index and its components (MaxT, MinT, Drought, Prec, Wind, Fire, Hail). Within each factor, the column “fs” presents the bivariate beta of the climate measure over the full sample; the columns “QR, Med, Med/IQR”, and “xPA”present, respectively, the beta of the climate measure and of its interaction with the Paris-agreement indicator (=1 from 2016) in the trivariate specification. Heteroskedasticity-consistent standard errors are in round brackets, and the R-squared of the corresponding regression is in square brackets, reported once under the bivariate column and once under the trivariate one. In the xPA cell, the figure in curly brackets is the post-agreement effect b1 + b2, obtained by accounting for the covariance between the two coefficients. Stock returns are in decimal points. The climate measures enter as standardized annual differences, so each beta is the return response to a one-standard-deviation climate shock. The estimated intercept and the coefficients for the macro-financial control variables (first differences of WUI Europe, GPR, NCISS, the German ex-post real long rate, the broad climate policy uncertainty index, and the recession dummy REC) are omitted. Bold values denote significance at the 10% level or better; those marked with an asterisk are significant at the 10% but not at the 5% level. † For minimum-temperature extremes the climate-relevant movement is a decrease in cold extremes: in the median-based panels (Climate Risk and Relative Climate Risk) the MinT betas are reported with reversed sign.

E3CI (IQR, median, median/IQR), AGGI, and natural oscillators



Dashed = series; solid = nonlinear (Fourier) trend

Figure 1. The plots show the cross-sectional unconditional interquartile range (IQR), median (MED), and their ratio (MED/IQR) for the E3CI index computed across the forty European countries considered in the study. The Figure also reports time series for the near-long- and short-periodic natural oscillators AMO, NAO, SOI (ENSO), SI, and the AGGI index. A third-order Fourier polynomial trend line is included (solid line).

Climate Uncertainty in Europe 1981-2024 - FE

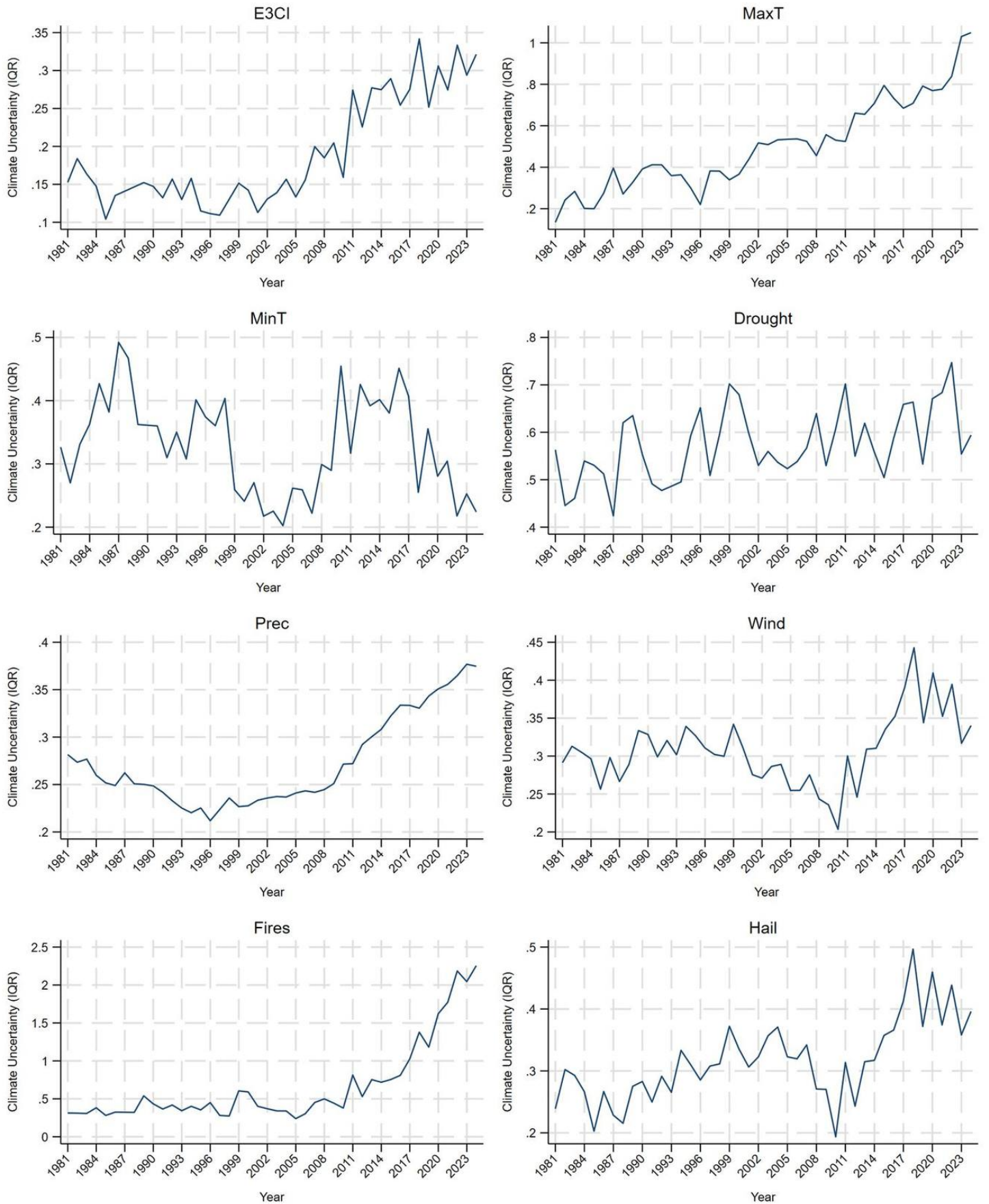


Figure 2. The plots show the Melly-Pons (2025) aggregate (average across countries) conditional interquartile functions for the E3CI index and its components, namely extreme maximum and minimum temperatures (MaxT, MinT), extreme wind (Wind), extreme precipitation (Prec), droughts (Drought), wildfires (Fire), and hail (Hail) components.

Climate Risk in Europe 1981-2024 - FE

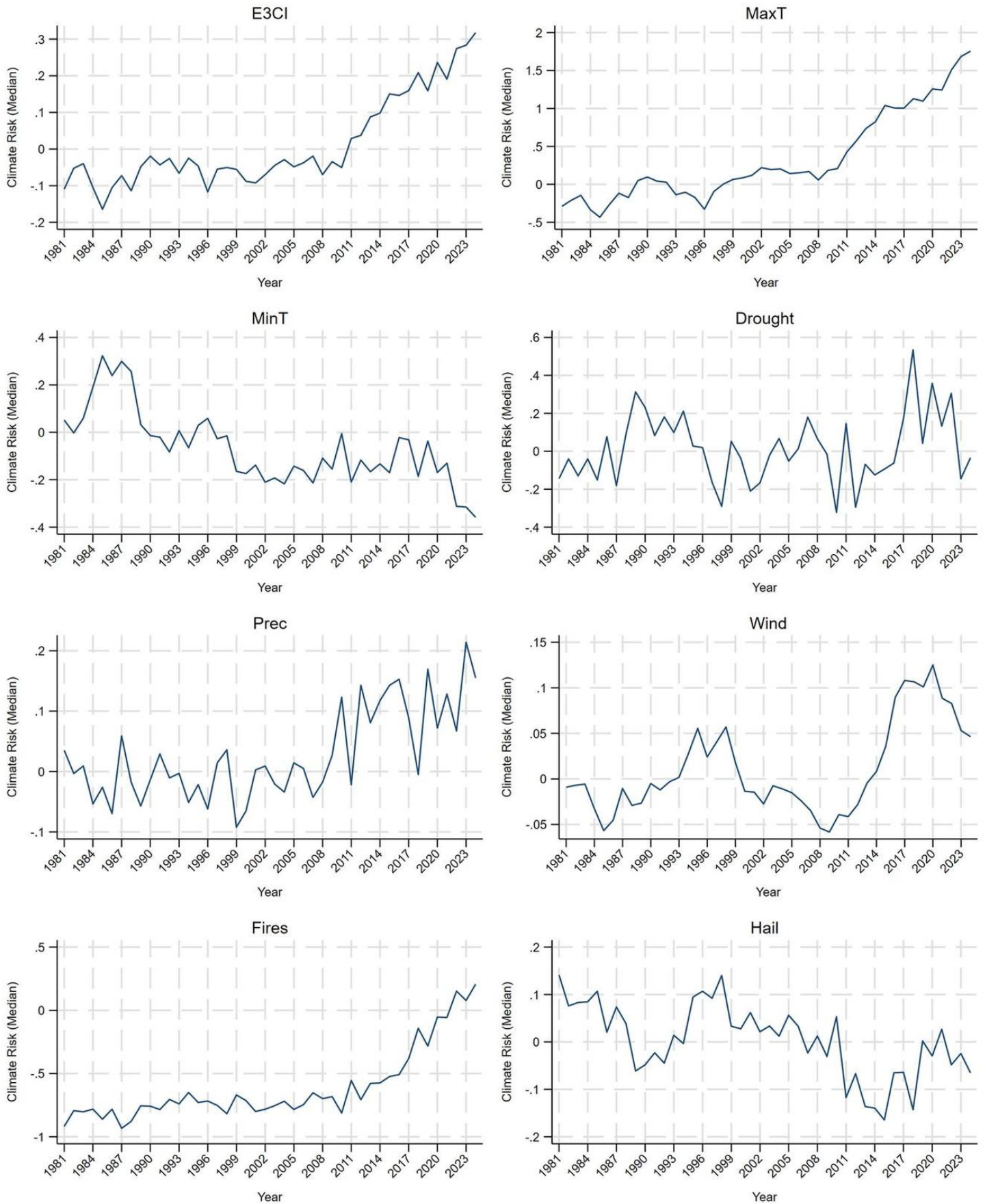


Figure 3. The plots show the Melly-Pons (2025) aggregate (average across countries) conditional median functions for the E3CI index and its components, namely extreme maximum and minimum temperatures (MaxT, MinT), extreme wind (Wind), extreme precipitation (Prec), droughts (Drought), wildfires (Fire), and hail (Hail) components.

Relative Climate Risk in Europe 1981-2024 - FE

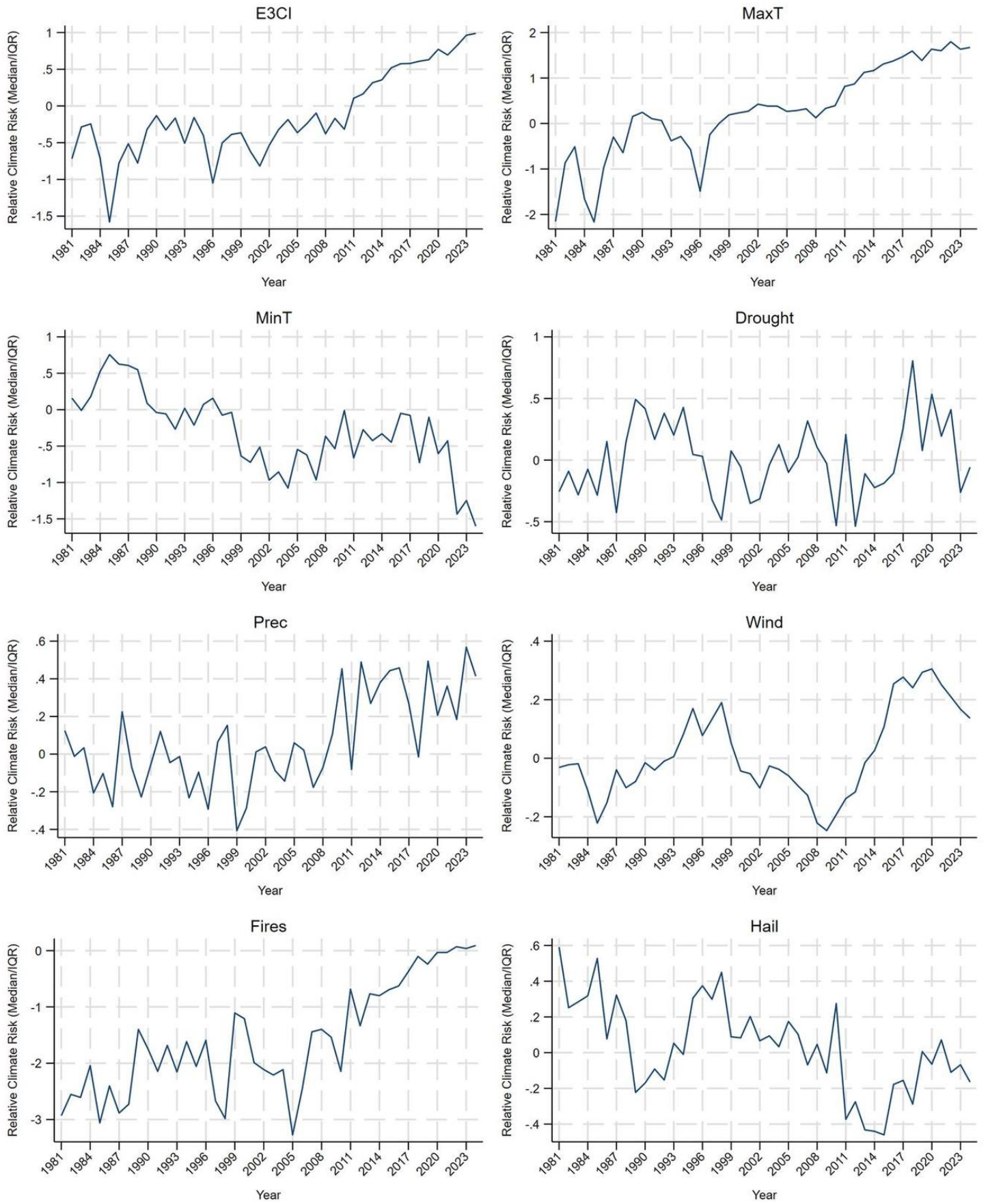


Figure 4. The plots show the ratios of the Melly-Pons (2025) aggregate (average across countries) conditional median over IQR functions for the E3CI index and its components, namely extreme maximum and minimum temperatures (MaxT, MinT), extreme wind (Wind), extreme precipitation (Prec), droughts (Drought), wildfires (Fire), and hail (Hail) components.

E3CI Median & IQR geography (terciles) and PC1 x PC2 quadrants (2010 break)

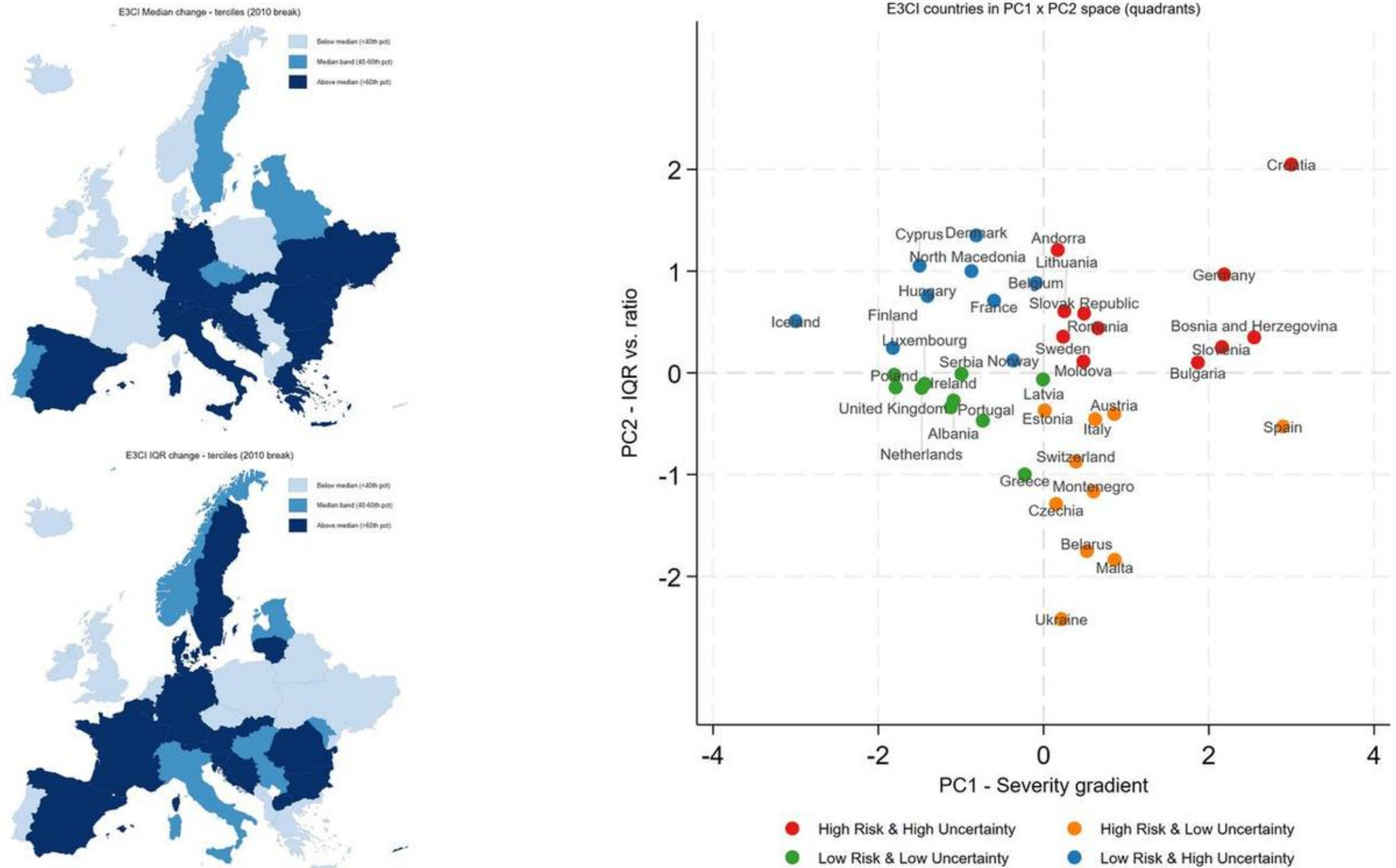


Figure 5. The left-hand panel maps the country-level change in the conditional median (top plot) and IQR (bottom plot) of the E3CI index, computed as the post-break average relative to the pre-break average. The breakpoint is 2010. Values are standardized across countries and grouped into three percentile bands: below the 40th percentile ("below median"), between the 40th and 60th ("median band"), and above the 60th ("above median"). Countries shaded dark blue therefore experienced a post-2010 increase in climate-risk level above the cross-country median. The right-hand panel positions each country by its scores on the first two principal components extracted from the standardized post-pre differences of the three moments (Median, IQR, and Median/IQR ratio), coloring each country by the quadrant it occupies (the sign of each score, split at the mean-zero origin), so that the four groups form a descriptive 2x2 grid. The first component (PC1, horizontal) is a severity gradient: higher PC1 denotes a broadly larger risk increase. The second component (PC2, vertical) is a modality contrast: higher PC2 indicates a change driven more by widening dispersion (uncertainty) than by level.

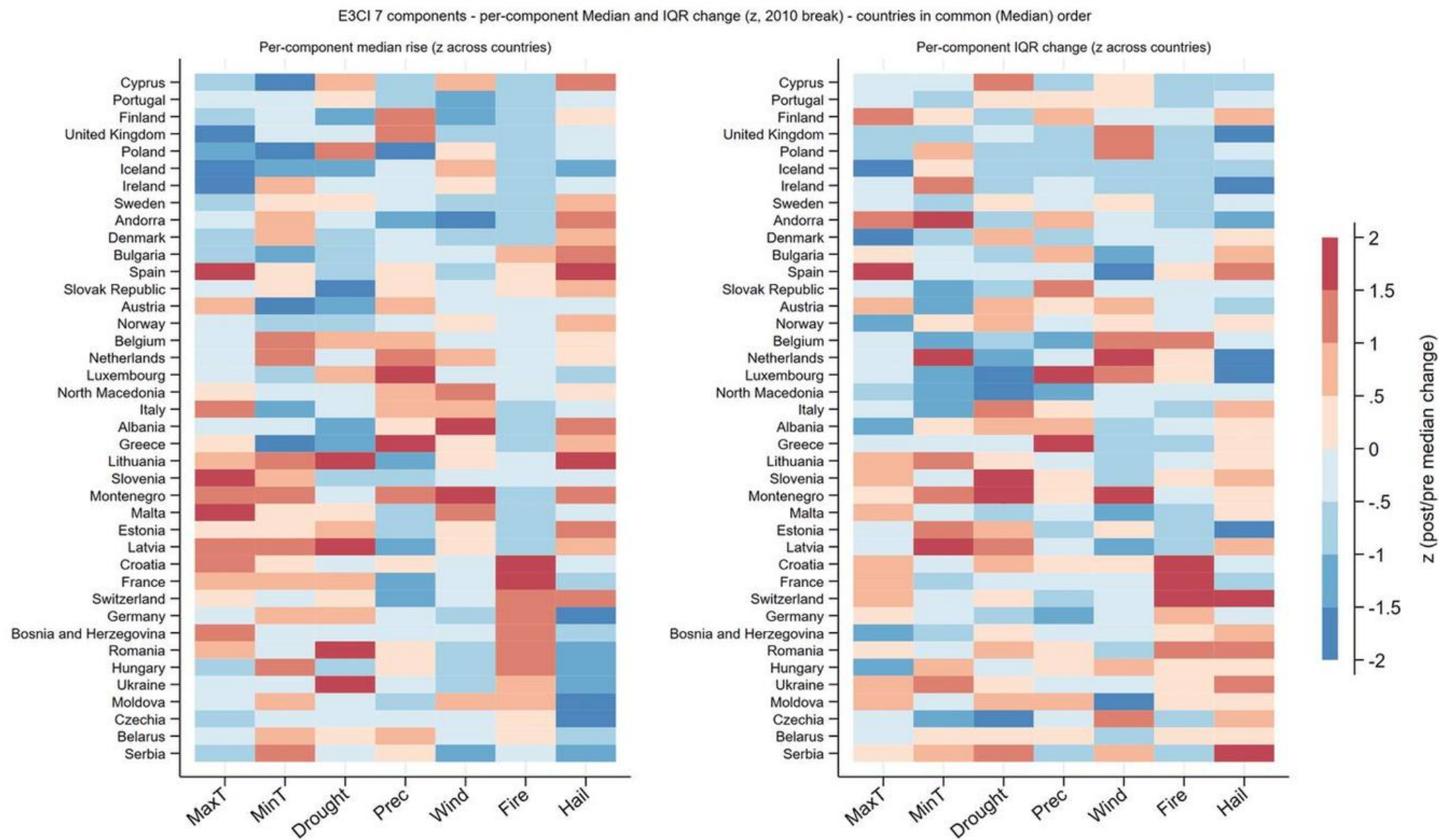


Figure 6. Per-component decomposition of the median climate-risk and uncertainty change after the 2010 break. Each row is one of the 40 European countries, and each column is one of the seven E3CI hazard components (maximum temperature, minimum temperature, drought, precipitation, wind, wildfires, and hail). Cell shading is the post/pre change in the conditional median (left-hand plot) or the IQR (right-hand plot) of that component, standardized across countries (z-scores) and capped at ± 2 standard deviations for display; on the diverging red-blue scale, red denotes an above-average rise in that hazard and blue a below-average change, with near-white cells close to the cross-country mean.

E3CI 7 components (median) - PCA quadrant scatters (2010 break)

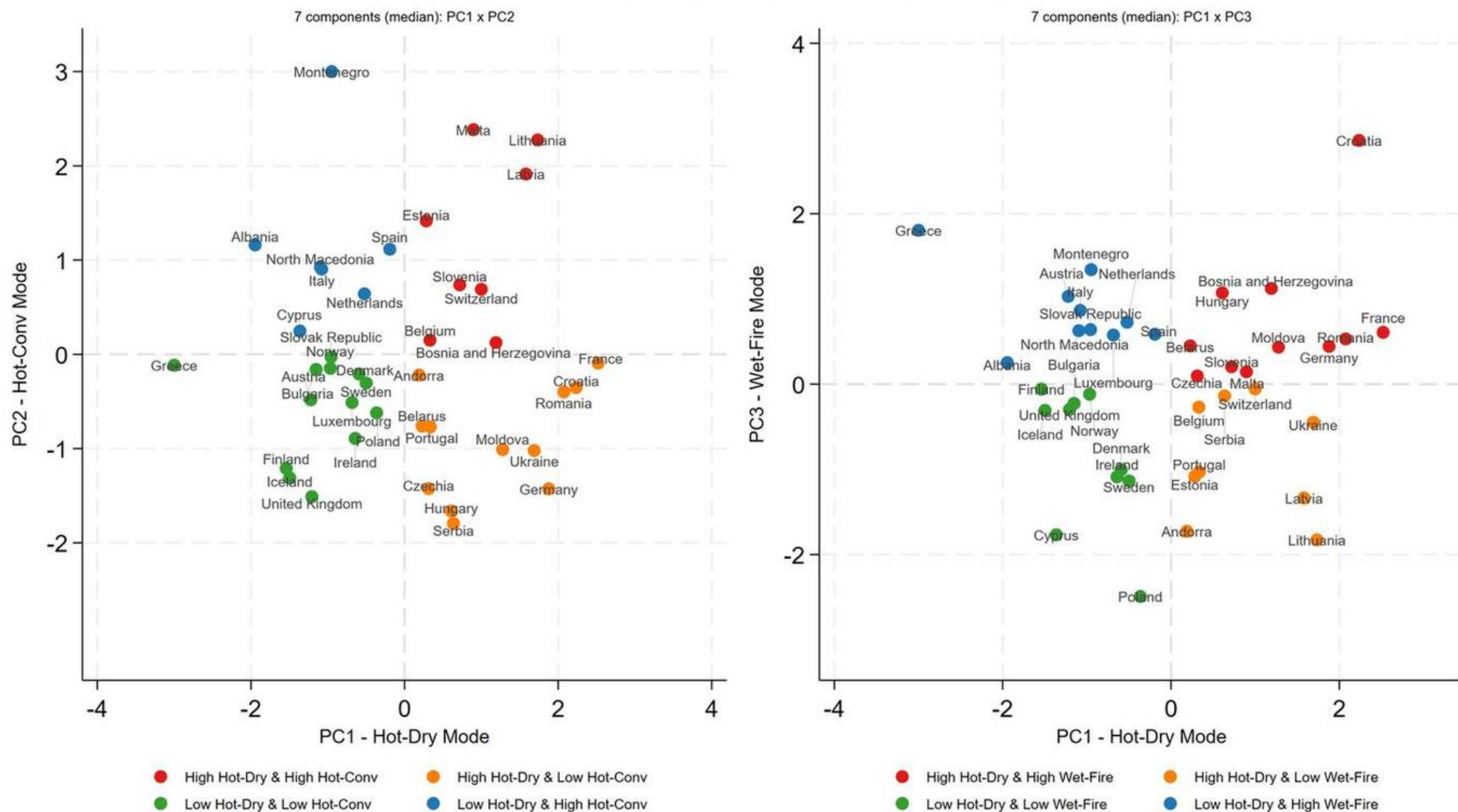


Figure 7. Country positions in the principal-component space of the seven-component median change, after the 2010 break. Both panels plot the same 40 countries by their scores on the principal components extracted from the standardized post/pre change in the conditional median of the seven E3CI hazards; the left panel uses and the right panel. Component signs are oriented so that higher scores correspond to the named mode. PC1 is the Hot-Dry mode, PC2 the Hot-Convective mode, and PC3 the Wet-Fire mode. Each country is colored by the quadrant it occupies, with the split at the mean-zero origin, yielding a descriptive grid on each axis pair.

E3CI 7 components (IQR) - PCA quadrant scatters (2010 break)

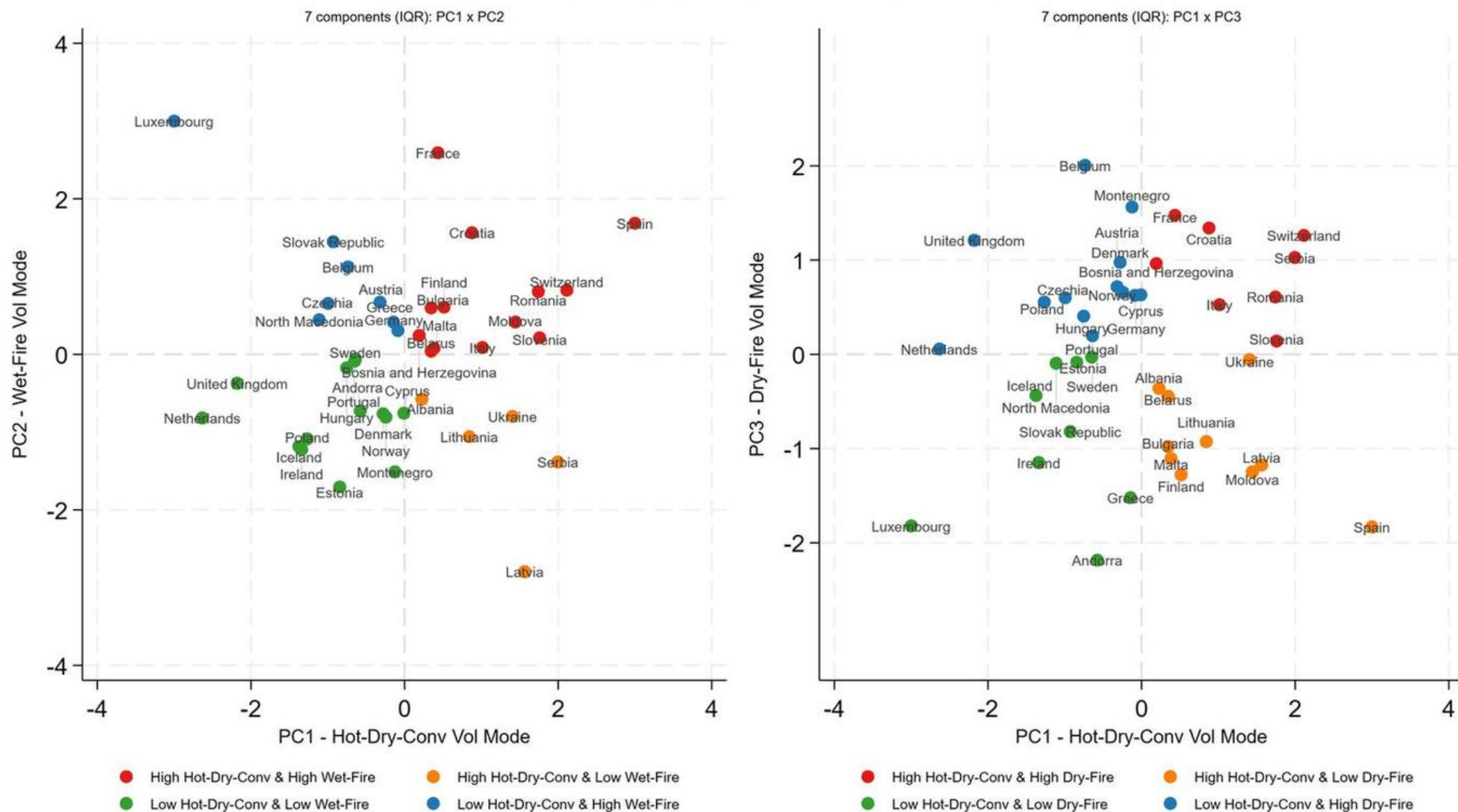


Figure 8. Country positions in the principal-component space of the seven-component IQR change, after the 2010 break. Both panels plot the same 40 countries by their scores on the principal components extracted from the standardized post/pre change in the conditional IQR of the seven E3CI hazards. Component signs are oriented so that higher scores correspond to the named mode. PC1 is the Hot-Dry-Convective mode, PC2 the Wet-Fire mode, and PC3 the Dry-Fire mode. Each country is colored by the quadrant it occupies, with the split at the mean-zero origin, yielding a descriptive grid on each axis pair.

E3CI 7-component risk zones: Median (left) and IQR (right), 2010 break

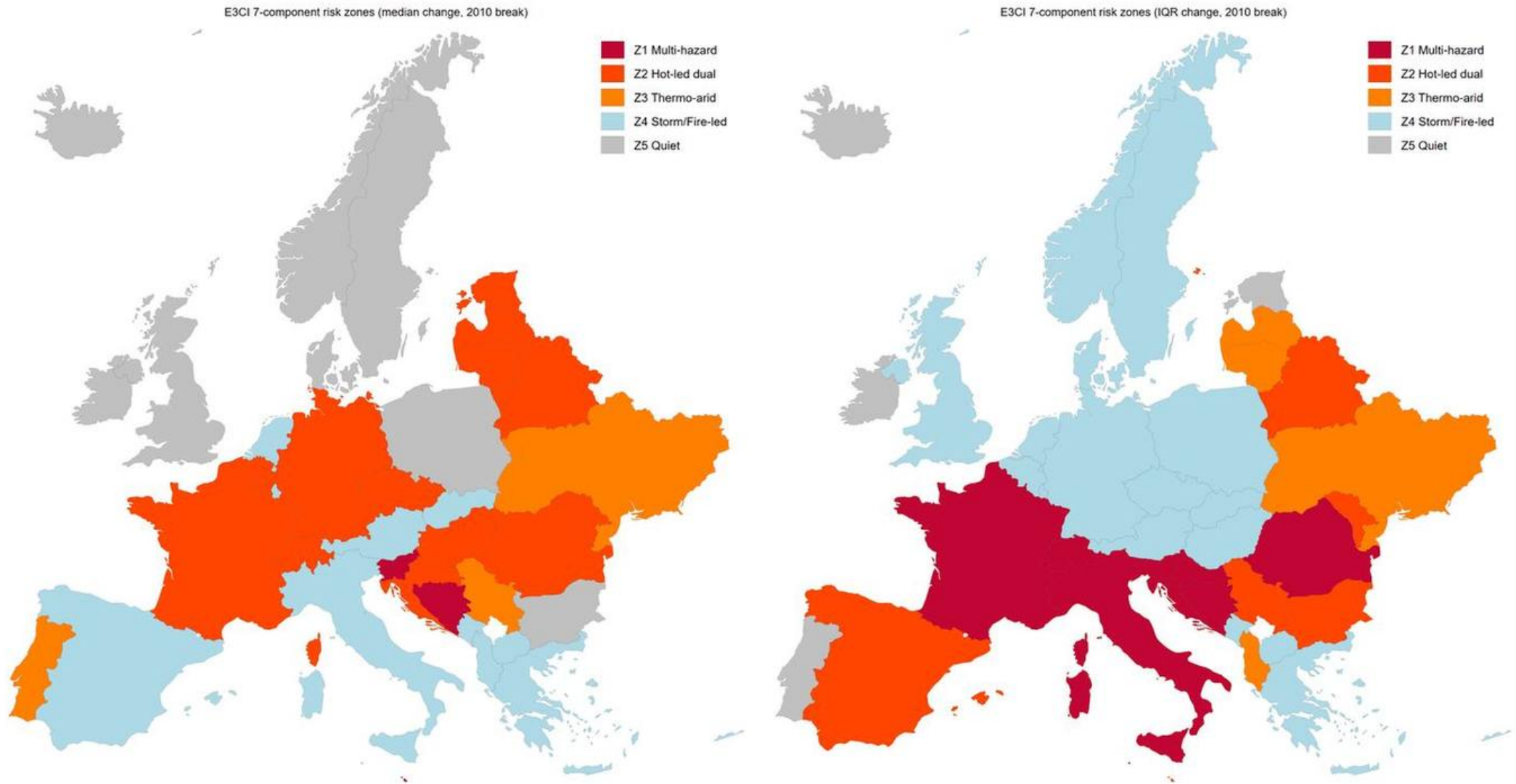


Figure 9. E3CI seven-component risk zones after the 2010 break: median change (left) and IQR change (right). Each country is assigned to one of five zones by a deterministic partition of its three-mode octant (flag order PC1, PC2, PC3): Z1 Multi-hazard = HHH; Z2 Hot-led dual = HHL or HLH; Z3 Thermo-arid = HLL; Z4 Storm/Fire-led = LHH, LHL, or LLH; Z5 Quiet = LLL, where "High" denotes a positive sign-oriented component score. The octant-to-zone rule is identical across the two panels; only the meaning of the modes differs: for the median (level), PC1, PC2, and PC3 are the Hot-Dry, Hot-Convective, and Wet-Fire modes, while for the IQR (dispersion) they are the Hot-Dry-Convective, Wet-Fire, and Dry-Fire volatility modes.

Beyond Climate Risk: Measuring Climate Uncertainty and Its Macroeconomic and Financial Effects: Online Appendix

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Abstract

This Appendix presents details about the data employed in the study and additional results related to the robustness assessment of the model specification, the geography of climate change risk and uncertainty, and their economic and financial implications.

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A1 The Data

A1.1 Climatological data

- The European Extreme Events Climate Index (E3CI) is derived from ERA5 (doi: 10.24381/cds.adbb2d47), the fifth-generation atmospheric reanalysis of the European Centre for Medium-Range Weather Forecasts (ECMWF), which provides global hourly data on a regular $0.25^\circ \times 0.25^\circ$ latitude–longitude grid since January 1950, distributed through the Climate Data Store of the Copernicus Climate Change Service (C3S). The E3CI measures the frequency and intensity of extreme weather events through seven components: extreme maximum and minimum temperature, drought, extreme precipitation, extreme wind, wildfires, and hail. Monthly deviations from the 1981–2010 reference climatology are expressed as standardized anomalies (Z-scores). We compute annual averages of the monthly values for 40 European countries over the period 1981–2024: Albania, Andorra, Austria, Belarus, Belgium, Bosnia-Herzegovina, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Moldova, Montenegro, the Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine, and the United Kingdom. Data are available at <https://climateindex.eu>.
- The NOAA Annual Greenhouse Gas Index (AGGI) measures the radiative forcing of long-lived greenhouse gases (CO_2 , CH_4 , N_2O , and halogenated compounds such as CFCs) from direct atmospheric observations, normalized to 1.0 in the 1990 baseline year. It is computed by the Global Monitoring Laboratory of the National Oceanic and Atmospheric Administration (NOAA) and is available, together with the methodological documentation, at <https://gml.noaa.gov/aggi/aggi.html>. The 2024 figure is forecasted using a structural time series model.
- Solar irradiance (SI) is the radiant power incident per unit area from the Sun (W/m^2), subject to the quasi-periodic 11-year solar activity cycle, over which total solar irradiance (TSI) varies by about 0.1%. We use TSI data recorded since 1996 by the PMO6 radiometer on board SOHO/VIRGO (new VIRGO, degradation corrected), computing annual figures as averages of the daily data available at <https://repo.astromat.org/view.php?id=3532&system=astro>. Pre-1996 figures are from the CMIP5 total solar irradiance reconstruction, with annual data available at <https://data.giss.nasa.gov/modelforce/solar.irradiance/solar.lean2015.ann1610-2014.txt>. The index is made unit-free by normalizing $\text{SI}_{1981} = 1$.
- The Southern Oscillation Index (SOI) is a standardized measure of the sea-level pressure difference between Tahiti and Darwin, Australia, and captures the atmospheric component of the El Niño–Southern Oscillation (ENSO), the coupled ocean–atmosphere phenomenon of the equatorial Pacific, recurring at irregular intervals of two to seven years. Sustained negative SOI values are typically concurrent with the anomalous warming of the central and eastern tropical Pacific characteristic of El Niño episodes, and sustained positive values with the anomalous cooling characteristic of La Niña episodes. We compute annual figures by averaging the monthly values available at <https://www.cpc.ncep.noaa.gov/data/indices/soi>.

- The North Atlantic Oscillation (NAO) index is defined by the difference in surface sea-level pressure between the Azores High and the Subpolar Low. In its positive phase, above-normal temperatures in northern Europe, enhanced rainfall over northern Europe and Scandinavia, and reduced precipitation across southern and central Europe are typically observed, with the opposite anomalies prevailing in the negative phase; fluctuations occur on seasonal, inter-annual, and decadal timescales. We compute annual figures by averaging the monthly values available at <https://www.cpc.ncep.noaa.gov/products/precip/CWlink/pna/norm.nao.monthly.b5001.current.ascii.table>.
- The Atlantic Multidecadal Oscillation (AMO) is a long-term mode of North Atlantic climate variability, with alternating warm and cool sea surface temperature phases lasting 20 to 40 years and an estimated periodicity of 60 to 80 years. The index is computed from detrended sea surface temperature anomalies averaged over the North Atlantic basin (0° to 80°N); the North Atlantic has been in a warm phase since the mid-1990s. We compute annual figures by averaging the monthly values available at <https://psl.noaa.gov/data/timeseries/AMO/>. Data for 2023 and 2024 were forecasted using a structural time series model.
- Average surface temperatures are from the ERA5 0.25-degree database, available from the World Bank Climate Change Knowledge Portal at <https://climateknowledgeportal.worldbank.org/download-data>.

A1.2 Policy and geographical controls

- The Notre-Dame Global Adaptation Index (ND-GAIN) measures a country’s resilience to climate change through two components: vulnerability, i.e., exposure to climate-related risks in key sectors such as food, water, health, and infrastructure, and readiness, i.e., the capacity to attract investment and implement effective adaptation strategies. Countries with higher scores are expected to experience smaller economic losses from extreme weather events. Data are available at <https://gain.nd.edu/>. The missing series for Andorra is reconstructed as a weighted average of the corresponding French and Spanish series, with weights given by the inverse distance of each country’s per capita GDP from Andorra’s, averaged over the sample period to avoid excessive year-to-year volatility in the synthetic series.
- The Climate Change Performance Index (CCPI) by Burck et al. (2025) evaluates a country’s progress in implementing climate-mitigation policies through 14 indicators grouped into four categories: greenhouse gas emissions, renewable energy, energy use, and climate policy. The top three overall positions are intentionally left vacant to signal that no country is yet aligned with the Paris Agreement objectives. Data are provided by Germanwatch, the NewClimate Institute, and the Climate Action Network (<https://www.newclimate.org>), and are subject to a non-disclosure agreement that prevents redistribution. For the eight countries for which CCPI data are unavailable (Albania, Andorra, Bosnia and Herzegovina, Iceland, Moldova, Montenegro, North Macedonia, and Serbia), we use as a substitute the EPI Climate Change Mitigation score (CCH), an index of climate-change mitigation performance reconstructed from eleven mitigation indicators of the 2024 Environmental Performance Index (Yale Center for Environmental Law & Policy

and CIESIN, Columbia University), aggregated using the official EPI 2024 weights: adjusted emission growth rates for CO₂ (CDA, 25.0), GHG growth adjusted by emissions intensity (GTI, 20.0) and by per-capita emissions (GTP, 20.0), CH₄ (CHA, 10.0), F-gases (FGA, 6.7), black carbon (BCA, 5.0), N₂O (NDA, 3.3), net land-cover carbon fluxes (LUF, 3.3), projected 2050 emissions (GHN, 3.3), CO₂ with country-specific carbon-budget targets (CDF, 1.7), and projected cumulative emissions to 2050 relative to the allocated carbon budget (CBP, 1.7).

- A country’s affluence level is measured by real GDP per capita (constant 2015 US dollars), sourced from the World Bank (NY.GDP.PCAP.KD). The link between income levels and climate-related damages is motivated by the expectation that wealthier societies are more likely to support and finance adaptation and mitigation policies (Baiardi and Morana, 2021). Moreover, higher income levels also expand fiscal capacity for implementing such policies, thereby reducing the negative effects of climate change.
- Geographical indicators. Countries are grouped into regional blocks: Northern vs. Southern Europe, and Eastern vs. Western Europe. Based on longitude, countries often considered Central European are allocated to one of these groups. Central and Northern Europe: Austria, Belarus, Belgium, Czechia, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Moldova, the Netherlands, Norway, Poland, Serbia, Slovakia, Sweden, Switzerland, Ukraine, and the United Kingdom. Central and Southern Europe: Albania, Andorra, Bosnia-Herzegovina, Bulgaria, Croatia, Cyprus, Greece, Italy, Malta, Montenegro, North Macedonia, Portugal, Romania, Slovenia, and Spain. A clearer division emerges between Western and Eastern Europe. Western Europe: Andorra, Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom. Eastern Europe: Albania, Belarus, Bosnia-Herzegovina, Bulgaria, Croatia, Czechia, Estonia, Hungary, Latvia, Lithuania, Moldova, Montenegro, North Macedonia, Poland, Romania, Serbia, Slovakia, Slovenia, and Ukraine.
- Institutional Quality Index. Following Canepa (2025), countries with stronger institutions are expected to be more resilient to climate change, as they are better equipped to design, implement, and enforce adaptation and mitigation policies. EU accession standards foresee the adoption of comprehensive environmental legislation and the establishment of regulatory bodies to ensure compliance. Long-standing EU members, the UK, and other Western or Northern European market economies are classified as having high institutional quality. Post-Soviet countries that joined the EU after 1995 are included in this group only from the year they officially became EU candidates. According to this criterion, the classification is as follows. High-quality institutions: Albania (since 2014), Andorra, Austria, Belgium, Bosnia-Herzegovina (since 2022), Bulgaria (since 2007), Croatia (since 2013), Cyprus, Czechia (since 2004), Estonia (since 2004), Denmark, Finland, France, Germany, Greece, Hungary (since 2004), Iceland, Ireland, Italy, Latvia (since 2004), Lithuania (since 2004), Luxembourg, Malta, Moldova (since 2022), Montenegro (since 2010), the Netherlands, North Macedonia (since 2005), Norway, Poland (since 2004), Portugal, Romania (since 2007), Serbia (since 2013), Slovakia (since 2004), Slovenia

(since 2004), Spain, Sweden, Switzerland, Ukraine (since 2022), and the United Kingdom. Low-quality institutions: Countries that never obtained EU candidate status during the sample period, and post-1995 EU members for all years prior to candidacy. These include Albania (up to 2013), Belarus, Bosnia-Herzegovina (up to 2021), Bulgaria (up to 2006), Croatia (up to 2012), Czechia (up to 2003), Estonia (up to 2003), Hungary (up to 2003), Latvia (up to 2003), Lithuania (up to 2003), Moldova (up to 2021), Montenegro (up to 2009), North Macedonia (up to 2004), Poland (up to 2003), Romania (up to 2006), Serbia (up to 2012), Slovakia (up to 2003), Slovenia (up to 2003), and Ukraine (up to 2021).

A1.3 Macroeconomic and financial variables

- Real GDP, private consumption and investment annual growth rates are sourced from the World Bank (constant 2015 US\$): NY.GDP.MKTP.KD.ZG, NE.CON.PRVT.KD.ZG, NE.GDI.FTOT.KD.ZG. For several post-Soviet and Eastern European economies, data availability begins later than for Western European countries. Specifically, data for Belarus, Bosnia-Herzegovina, Croatia, Czechia, Estonia, Latvia, Lithuania, Moldova, North Macedonia, Poland, Romania, Slovakia, and Slovenia start in 1991. Montenegro's data begin in 1998, Serbia's in 1996, and Ukraine's in 1988. To avoid distortions arising from major country-specific disruptions—particularly those associated with post-Soviet and post-Communist transitions—the sample is restricted as follows. For Albania, Belarus, Bosnia-Herzegovina, Bulgaria, Moldova, Montenegro, Serbia, and Ukraine, the sample begins in 2000. For the remaining Eastern European and Balkan countries, the starting year is either 1993 (Czechia, Slovakia, Slovenia) or 1995 (Croatia, Estonia, Hungary, Latvia, Lithuania, North Macedonia, Poland, Romania). Due to the ongoing war, Ukraine's observations since 2022 are excluded. Data are available at <https://data.worldbank.org/indicator>.
- The annual growth rates of employed persons and of average hours worked per employed person are sourced from The Conference Board Total Economy DatabaseTM, 2026, Output, Labor and Labor Productivity release (series TED1_ISO3_EMP and TED1_ISO3_AVGHR); the database is available for academic use but may not be redistributed (<https://esf.conferenceboard.esgauge.org/data-central>). Andorra and Montenegro are not covered by the database. For Montenegro the employment growth rate is computed from total employment obtained from the World Bank World Development Indicators (<https://data.worldbank.org/indicator>) as $E = LF \cdot (1 - u/100)$, where LF is the labor force (SL.TLF.TOTL.IN) and u the unemployment rate as a percentage of the labor force (SL.UEM.TOTL.ZS), both modeled ILO estimates. For Andorra we employ the total number of salaried employees (010201010026; <https://www.estadistica.ad/portal/apps/sites/#/estadistica-en/pages/base-de-dades?Idioma=en>).
- Labor productivity growth is obtained as differences of annual growth rates. The rate of growth of output per person employed is $PROL = GDP - EMP$, i.e., the difference between the rate of GDP growth and the rate of total employment growth. The rate of growth of output per hour worked is $PROH = GDP - EMP - HOURS$, i.e., the difference between the rate of GDP growth, the rate of total employment growth, and the rate of growth of total hours worked per employed person.

- Real wages are from the AMECO database of the European Commission, Directorate General for Economic and Financial Affairs, and enter as annual growth rates. The real product wage (*WPROD*) is real compensation per employee deflated by the GDP deflator (*RWCDV*); the real consumption wage (*WCONS*) is real compensation per employee deflated by the private consumption deflator (*RWCDC*). Their difference, $DWEDGE = WCONS - WPROD$, is the growth of the ratio of the GDP deflator to the consumption deflator and measures the terms-of-trade wedge between the two. The adjusted wage share of the total economy is also taken from AMECO. It is the percentage of GDP at current factor cost (*LSHAREF*, *ALCD2*). The factor-cost denominator excludes indirect taxes and subsidies. We compute its annual rate of growth. AMECO covers 35 of the 40 countries for wages and wage shares. For Belarus, Bosnia and Herzegovina, Moldova and Ukraine the series are constructed from the Penn World Table (version 10.0, GGDC): the real product wage per worker is the labor share times output per worker, $labsh \cdot rgdpna/emp$, and the consumption wage follows from the relative price of consumption, since the United States and exchange rate terms cancel in the ratio pl_con/pl_gdpo , so that its growth is domestic consumption price inflation net of GDP deflator inflation. Andorra, for which internationally comparable data are unavailable, and given Andorra's close economic integration with its two neighboring economies, real wages and labor shares are imputed as the simple average of the corresponding series for France and Spain.
- The unemployment rate (*URATE*) is the total unemployment rate as a percentage of the active population, from AMECO (*ZUTN*, Eurostat definition), completed for the countries AMECO does not cover with the World Bank World Development Indicators (*SL.UEM.TOTL.ZS*, modeled ILO estimate); the variable *URATEsrc* distinguishes the two. Its annual change in percentage points is *DURATE*. From the identity $L = E/(1 - u)$ the growth rate of the labor force follows as

$$DLF = EMP + \frac{100 \cdot DURATE}{100 - URATE},$$

and the entry margin as $DLFGAP = DLF - EMP$, the excess of labor force growth over employment growth. These two variables separate the extensive margin of employment from the participation margin: a rise in employment accompanied by a positive *DLFGAP* indicates entry from outside the labor force, the added-worker configuration, whereas a rise in employment with *DLFGAP* near zero indicates absorption of the existing pool of job seekers. The distinction bears directly on the interpretation of the productivity results, since only the former makes part of the measured decline in average productivity a matter of composition rather than of efficiency. The series for Andorra is missing.

- The ex-post coincident business cycle indicator is a quarterly dummy variable taking a unitary value during recessions according to the CEPR Eurozone business cycle chronology, available at <https://eabcn.org/dbc/peaksandtroughs/chronology-euro-area-business-cycles>. Following the convention, we use the “Peak Excluded” indicator. Monthly figures are obtained by keeping the quarterly indicator constant throughout the corresponding months, and the annual indicator takes a unitary value in a given year if the quarterly indicator signals a recession in at least one of its quarters.

- The Geopolitical Risk (GPR) Index by Caldara and Iacoviello (2022) provides worldwide coverage of adverse geopolitical events and tensions. It is available monthly at <https://www.matteoiacoviello.com/gpr.htm>. We compute quarterly and annual figures by averaging monthly observations over the corresponding quarters and years.
- The New CISS Financial Condition Index is a development of the CISS index introduced by Holló et al. (2012). It is computed for the Euro Area as a whole, and includes 15 financial stress measures covering the financial intermediaries sector, money markets, equity markets, bond markets and foreign exchange markets. It is available daily since 1980 at https://data.ecb.europa.eu/data/datasets/CISS/CISS.D.U2.Z0Z.4F.EC.SS_CIN.IDX. We compute monthly, quarterly, and annual figures by averaging daily observations over the corresponding months, quarters, and years.
- The World Uncertainty Index for Europe (WUI Europe) by Ahir et al. (2022) is a quarterly index that measures uncertainty by counting the frequency of the word “uncertainty” in Economist Intelligence Unit country reports, with higher values indicating greater uncertainty. It is available from 1990 at https://www.policyuncertainty.com/wui_quarterly.html; the missing earlier annual observations are filled through moment matching using the Baker-Bloom-Davis US Economic Policy Uncertainty Index, available at https://www.policyuncertainty.com/us_monthly.html. We compute annual figures by averaging quarterly observations over the corresponding years, while monthly figures are obtained by keeping the quarterly indicator constant throughout the corresponding months.
- The U.S. Climate Policy Uncertainty (CPU) Index by Gavrilidis et al. (2026) adapts the Baker, Bloom, and Davis (2016) methodology, identifying, from April 1985 onward, articles in eight major U.S. newspapers (the Boston Globe, Chicago Tribune, Los Angeles Times, Miami Herald, New York Times, Tampa Bay Times, USA Today, and the Wall Street Journal) that simultaneously contain an uncertainty term, a climate-related term (e.g., “climate”, “CO2”, “emissions”, “global warming”, “renewable energy”), and a policy or political term (e.g., “regulation”, “legislation”, “policy”, “Congress”, “EPA”). For each newspaper and month, the number of matching articles is scaled by the total number of articles published in that month, and the resulting eight monthly series are standardized to unit standard deviation and averaged into a single monthly indicator, available from 1985 at https://www.policyuncertainty.com/climate_uncertainty.html. We employ the “broad index” and compute quarterly and annual figures by averaging monthly observations over the corresponding quarters and years.
- The ex-post German 10-year Bund real interest rate is computed by subtracting from the monthly nominal interest rate figures the year-on-year CPI inflation rate for Germany. The series are available from FRED, with codes IRLTLT01DEM156N and CPGRLE01DEM659N, respectively. Quarterly and annual figures are computed by averaging the monthly figures over the corresponding periods.
- The European Fama-French market, size, value, profitability and investment factor returns (Fama and French, 2015) are in U.S. dollars, include dividends and capital gains, and are not continuously compounded. They are based on stock returns

for sixteen European countries, namely Austria, Belgium, Switzerland, Germany, Denmark, Spain, Finland, France, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Sweden, and the UK. Data at monthly, quarterly and annual frequencies are available since 1991 from the Kenneth French web-site, at https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html#International.

A2 Model selection and estimation: robustness analysis

The selection among the two competing modeling strategies, i.e., per-country GETS vs. pooled fixed-effects (FE) panel estimation, is based on two criteria: the pre-correction quantile-crossing rate (crossing then removed by the rearrangement of Chernozhukov et al., 2010), and the out-of-sample pinball loss $\rho_\tau(u) = u(\tau - \mathbf{1}\{u < 0\})$ in a rolling-origin one-step-ahead scheme over the post-2010 period, potentially affected by an accelerated warming (thirteen one-year-ahead origins, 2011-2023). In the comparison, we also include a per-country unrestricted model, which retains the full candidate set for every country model, as in the first stage of the Melly-Pons estimator (Melly and Pons, 2025). Comparing models may help address the bias-variance trade-off: the FE panel estimator, by pooling, improves efficiency but may introduce bias if slopes vary across countries. On the other hand, the per-country estimators reduce bias. Still, at the cost of efficiency, the unrestricted model does so to an even greater extent than the GETS model, given the available time span ($T = 44$). We report the comparison results in Table A1-A.

As shown in Table A1-A, we find no exploitable autoregressive persistence in any of the indices once we condition on the climate predictors and country effects. The FE reduction drops the lag outright in all eight cases (the E3CI index and its seven components). In the per-country analysis, the lag is retained in very few countries, from zero of forty (Drought) to nine (Fire), with the other indices in between. Including the lag raises the pre-correction crossing rate of the per-country GETS branch in six of the eight indices, for instance from 7.7% to 8.5% for E3CI, while it is flat for Drought (4.4%) and marginally lower for Hail (5.1% to 4.6%); for the unrestricted models, where we include the lag by definition, the increase is uniform across all eight indices (17.1% to 20.2% for E3CI). The static models also win the rolling-origin exercise in the two per-country specifications, with the pooled loss never smaller than the dynamic counterpart; in the pooled FE models, where the reduction process never retains the lag in the final model, the two specifications deliver essentially identical losses. The deterioration is sizable only for Fire, the very model which retains the lag most often, where the GETS loss inflates from 0.7 to 1.2 and the unrestricted from 0.9 to 1.4, and is modest elsewhere. Taken together, the evidence suggests that, when retained, the lag is at best neutral and never materially improves predictive ability.

Comparing the static specifications, the per-country unrestricted model is dominated by the other two in every index and on both metrics. The comparison between per-country GETS and FE is more nuanced. On the pre-correction crossing rate, the per-country GETS is uniformly better than the directly fitted FE panel. On the rolling loss, FE is best in six of eight cases (the exceptions being MinT and Drought). However, its margin over GETS is sizable only for MaxT (0.3 vs 0.4) and, more modestly, Fire, while for Hail the two are practically indistinguishable. Overall, for the aggregate analyses, we retain FE as the primary specification for comparability and parsimony, and report per-country

GETS as the co-equal robustness specification throughout. In contrast, we use per-country GETS as the headline specification when assessing cross-country heterogeneity. Moreover, per-country unrestricted GETS estimates of the climate indicators, the Melly-Pons first stage, are used for the robustness exercises at the convergence analysis step.

As a robustness check on the pooled Melly-Pons estimates reported in Table 2, we re-examine the underlying drivers using the per-country GETS models. We report the country-specific results in two complementary ways. First, the quantile-coefficient process reports, for each conditioning variable, the cross-country median of the estimated coefficients at the three conditional quantiles, together with an interquartile band describing the dispersion of country-level estimates. Second, the IQR-contribution boxplots report the cross-country distribution of each variable’s contribution to the conditional interquartile range, thereby identifying the drivers of climate-change uncertainty. We show these results in Figures A4 and A5. The shaded bands and boxplots measure cross-country heterogeneity, rather than the estimation uncertainty of an individual coefficient. Overall, the per-country evidence closely reproduces the pooled Melly-Pons results. The estimated signs, the ordering of the conditional quantiles, and the asymmetric loading through which anthropogenic forcing generates climate uncertainty are all preserved when moving from the pooled panel to country-by-country estimation.

First, we confirm the asymmetric role of anthropogenic forcing in determining climate risk and dispersion. Across the trending climate indicators, the cross-country median of the leading cosine coefficient (cx_{05}) is uniformly negative, becomes progressively more negative from the lower to the upper conditional quantile. In contrast, the leading sine coefficient (sx_1) is positive and increases monotonically across quantiles. This configuration is precisely what the pooled model identifies as generating a widening of the conditional interquartile range. Wildfires provide the clearest illustration. The cross-country median of the cosine coefficient declines from approximately -0.4 at the first quartile to about -1.15 at the third quartile. In contrast, the corresponding sine coefficient rises from roughly 0.2 to 0.8, closely matching the pooled estimates (-0.17 to -1.15 and 0.06 to 0.54, respectively).

The IQR-contribution boxplots convey the same message from a complementary perspective. For E3CI, MaxT, MinT, Precipitation, Wind and, most prominently, Fire, the Fourier terms generate large, signed contributions to the conditional spread, whereas for Drought and Hail their contributions are centered around zero and display wide cross-country variation. This result mirrors the pooled evidence that the AGGI terms do not significantly contribute to the uncertainty of the two non-trending indicators, which lack the secular component through which the convex AGGI mechanism operates. Hence, the dual role of anthropogenic forcing in shaping both the level of climate risk and its uncertainty proves robust to the estimation strategy.

Second, the role of the Atlantic Multidecadal Oscillation (AMO) is equally stable. Whenever the cross-country median differs materially from zero, its effect is positive, notably for E3CI, MaxT, Wind and Hail, consistently shifting the conditional median of climate risk. In contrast, the IQR-contribution boxplots show that the AMO contributes little to the conditional spread for every indicator, with the corresponding distributions invariably centered around zero. Thus, as in the pooled model, the AMO affects the level of climate risk without systematically increasing its uncertainty.

The natural oscillators continue to explain predominantly cyclical fluctuations, with the North Atlantic Oscillation (NAO) remaining the most pervasive driver. The cross-country median coefficients are positive for MaxT, Drought and Fire, and for Wind, where

the pooled effect emerges at the upper conditional quantile. It is negative for MinT, Prec and Hail, reproducing the sign pattern obtained in Table 2. The contribution to uncertainty is equally consistent. The NAO widens the conditional interquartile range of E3CI, Wind, Fire and Hail, while reducing that of MinT, thereby replicating both the direction and the relative importance of the pooled estimates.

Third, the remaining oscillators exhibit the same degree of concordance. The Southern Oscillation Index (SOI) generates negative median effects for MaxT and Prec, a positive median effect for Drought, and a positive effect at the upper conditional quantile for Fire. Correspondingly, the IQR-contribution boxplots show that the SOI compresses the conditional spread of MaxT while widening those of Drought and Fire, in close agreement with the pooled analysis. Solar irradiance (SI) likewise reproduces the benchmark results. It raises the conditional median of MaxT and Prec, lowers that of MinT, and is neutral on Drought, Fire, and Hail. Its contribution to uncertainty is relevant only for Fire, whereas for the aggregate E3CI index and Wind it remains negligible, exactly as in the pooled specification.

Finally, the few discrepancies are confined to the weakest-signal indicators and do not alter the substantive conclusions. For Drought, the pooled model identifies a significantly negative AMO effect at the first quartile. In contrast, the cross-country median estimated by GETS is close to zero and surrounded by a relatively wide interquartile band, reflecting the limited number of countries in which the variable survives the selection procedure. Similarly, for Hail, the higher-order Fourier terms and solar irradiance display weaker and more heterogeneous effects than in the pooled estimates, consistent with the intrinsically cyclical and comparatively noisy nature of this indicator. More generally, because the per-country GETS specification retains the union of predictors selected across countries, variables discarded by the pooled reduction occasionally exhibit non-zero cross-country median coefficients, for example the higher-order cosine terms for MaxT and Wind. These coefficients, however, are precisely those associated with the widest cross-country bands, indicating genuine geographical heterogeneity rather than systematic disagreement with the pooled model.

Taken together, the country-specific analysis strongly confirms the pooled Melly-Pons results. Anthropogenic forcing continues to govern both climate-change risk and climate-change uncertainty through a convex, quantile-asymmetric mechanism; the AMO shifts the level of climate risk without materially affecting its dispersion; the NAO remains the dominant cyclical driver and the principal natural contributor to climate uncertainty; and Fire continues to represent the unique component for which natural oscillations rival anthropogenic forcing in shaping the conditional interquartile range.

Table A1-B summarizes the comparison between the two estimation approaches. Each entry reports the common qualitative outcome of the pooled fixed-effects and per-country GETS estimators. A “+” or “-” denotes a statistically significant coefficient (10% level or better) and whose sign is confirmed by the cross-country median GETS estimate; “.” denotes the absence of a significant effect on the conditional median (Panel A) or the conditional interquartile range (Panel B); and “~” indicates agreement in sign but weaker robustness because the GETS cross-country distribution remains comparatively wide. For the AGGI Fourier block, “✓” denotes a significant trigonometric loading, “(✓)” a sparser or higher-order representation, “+” in Panel B a net widening of the conditional interquartile range, “±” a significant but offsetting contribution, and “.” the absence of a significant AGGI effect. Importantly, no sign reversals occur between the pooled fixed-effects and the per-country GETS estimators, either for the conditional median

or for the conditional interquartile range. The few entries marked with the superscript “a” identify variables that are insignificant at the conditional median but significant at another quantile, for example the AMO for Drought ($\tau = 0.25$) and Hail ($\tau = 0.75$), or the NAO and SOI for Wind and Fire at the upper quantile, with the GETS cross-country medians displaying the same qualitative pattern.

Overall, Table A1-B confirms that the per-country GETS estimator reproduces the entire architecture of the benchmark fixed-effects model. Anthropogenic forcing governs both the conditional median and the conditional interquartile range for the six trending indicators while disappearing from the uncertainty of Drought and Hail. The AMO consistently shifts climate risk levels without affecting dispersion. The NAO is the most pervasive cyclical driver and the only natural oscillator that systematically contributes to uncertainty. The SOI compresses the uncertainty of MaxT while widening that of Drought and Fire. Solar irradiance increases uncertainty only for Fire. The “~” and superscript “a” markers therefore identify geographical heterogeneity or quantile-specific effects rather than genuine inconsistencies between the two estimation approaches.

Figures A6-A8 plot the aggregate conditional interquartile ranges, conditional medians, and MED/IQR ratios from the per-country GETS estimator against estimates from the Melly-Pons pooled estimator, allowing a direct comparison with the benchmark fixed-effects results. As shown in Figures A6 and A7, the two constructions track one another closely for the conditional median. Correlations range from 0.83 for Wind to 0.99 for MaxT and Fire. Agreement is somewhat weaker for the IQR, although it remains very high for MaxT and Fire, with correlations of 0.98 and 0.95, respectively; it falls to 0.76 for Prec, 0.72 for Wind, and 0.50 for MinT. These differences in the two underlying moments naturally propagate into their ratio, i.e., the relative risk measure MED/IQR .

As shown in Figure A8, the two MED/IQR indicators are nevertheless closely aligned across all components. Correlations are 0.95 for E3CI, 0.97 for MaxT, 0.96 for Hail, 0.89 for Fire, 0.88 for Prec, 0.86 for MinT, 0.83 for Drought, and 0.79 for Wind. Average differences are negligible throughout, ranging from (-0.075) for MaxT to (+0.026) for Drought. For Hail and Wind, the series are nearly indistinguishable, with maximum annual discrepancies of only 0.17 and 0.19, respectively. Differences are similarly small for Prec and Drought. For E3CI, the only notable divergence occurs in the mid-2000s, when the pooled measure is on average 0.26 below the per-country measure. Thus, the two constructions differ primarily in the timing of short-lived episodes rather than in their long-run level or trend. The only series showing higher discrepancies are Fire and MinT.

For Fire, the two MED/IQR series have a correlation of 0.89, share the same pronounced upward trend, and have an average difference of zero. They diverge mainly in two episodes. The pooled measure is higher in the 1980s, but lower during the mid-2000s. The latter reflects differences in the timing of the underlying moments. From 2000 to 2008, the pooled IQR is smaller while its median is more negative, pushing the ratio downward; after 2015, the ordering reverses as pooled dispersion rises more rapidly. MinT displays a similar pattern. The two relative-risk measures are correlated at 0.86 and share the same long-run downward trajectory, with differences concentrated in the 1980s, when the pooled measure is on average higher, and the early-to-mid 2000s (and at the end of the sample), when it is lower. Hence, as with Fire, the divergence is primarily temporal rather than a systematic difference in the long-run level of the relative-risk measure. Overall, the results are consistent with the preceding robustness analysis; the two estimation approaches yield highly similar trend dynamics for all climate indicators.

Although a few indicators display modest differences in short-run variability and, occasionally, in the timing of local fluctuations, these differences do not affect the underlying evolution of the series. Overall, the qualitative interpretation of the indicators is virtually identical under the two estimation strategies.

A3 The cross-country distribution of climate-risk and uncertainty: robustness analysis

In the robustness analysis, we address three complementary issues. First, we examine the sensitivity of the cross-country configuration to the choice of structural breakpoint. Second, we evaluate the stability of the principal-components structure and the associated hazard decomposition. Third, we assess whether the convergence results are robust to the estimation method, the breakpoint date, and, for the relative-risk indicator, the aggregation rule used to combine the underlying moments.

Cross-country analysis For the cross-country analysis, we first assess whether each country retains its tercile band of the change, i.e., below the 40th percentile, the 40th-60th median band, or above the 60th, when the break is moved from 2010 to 2015, for each of the three E3CI measures (Figures A9-A10). The cross-country classification proves remarkably stable. For the median (*MED*) indicator, 35 of the 40 countries (88%) remain in the same tercile when the breakpoint is shifted from 2010 to 2015. Of the five reclassified countries, four move only to an adjacent tercile (Andorra and Portugal from the median band to below, the Slovak Republic from above to the band, France from below to the band), while Sweden is the sole case exhibiting a two-band transition (below to above), consistent with the stronger increase in Scandinavian climate risk visible in the post-2015 map. The other two measures are at least as stable, and their reclassifications are again contiguous. For the relative measure *MED/IQR*, the structure is the most robust of the three: 38 of 40 countries (95%) keep their band, with only two adjacent-band moves (Estonia from above to the median band, Sweden from the band to above) and no two-band jump. For the *IQR*, the headline figure is lower, i.e., 30 of 40 (75%). Still, the interpretation is unchanged, because all ten movers are single-step and roughly balanced between upgrades (Cyprus, Latvia, Moldova and Norway into the top band, Finland into the median band) and downgrades (Austria, Bulgaria, France and Romania to the median band, Italy to the lowest), so no country crosses the distribution from one extreme to the other. Across all three measures, therefore, the substantive geography is invariant to the break: the above-median core remains concentrated in central-eastern and Mediterranean Europe (the Iberian peninsula, Italy, Germany, the Balkans, Ukraine and the Baltics) and the below-median group on the British Isles, Iceland, Poland and France.

The principal-components structure is equally robust (Table A2, Panels A, B). Both the eigenvalue spectrum and the proportion of explained variance remain virtually unchanged across break dates, indicating that the latent dimensionality of climate change is insensitive to the choice of structural breakpoint. For the three-moment E3CI analysis (Panel A), the configuration is two-dimensional under both breaks. The first two components account for 96% of the variance in each case, splitting it 0.68/0.28 in 2010 and 0.64/0.32 in 2015. For the seven-component analyses (Panel B), the spectrum is flat in both breaks. The first three components cumulate to about 62% in every measure (0.61-

0.62 for the *IQR*, 0.62 for the *MED/IQR*, and 0.62 and 0.60 for *MED*), so the genuine multidimensionality of the component-level change is not an artifact of the break date.

Moreover, the eigenvectors, and hence the interpretation of the axes, are stable wherever the eigenvalues are well separated. We quantify this with Tucker’s congruence coefficient φ (the cosine between two loading vectors; $|\varphi| \geq 0.95$ denotes essentially identical axes and 0.85-0.94 a fair match) and with the principal angles between the two three-dimensional loading subspaces. In Panel A, the axes are indistinguishable across breaks ($|\varphi| = 0.999$ for all three components; all three principal-angle cosines equal to one), so the severity and *IQR*-versus-ratio interpretations carry over directly. In Panel B, the *IQR* axes are very stable ($|\varphi| = 0.99, 0.99, 0.97$, no reordering) and the *MED/IQR* axes are also stable ($|\varphi| = 0.92$ on PC_1 , 0.86 on PC_2 and PC_3). *MED* constitutes the only apparent exception. Unlike the *IQR* and *MED/IQR* indicators, its first two eigenvalues are closely spaced (about 0.23 in 2010 and 0.26 in 2015), roughly half the corresponding *IQR* gap (about 0.48 and 0.49), implying that the associated eigenvectors are only weakly identified. Under these circumstances, modest sampling variation is sufficient to rotate the first two principal components between breaks and exchange their roles (diagonal congruences $|\varphi|$ of 0.43 and 0.41; off-diagonals of 0.87 and 0.83). This exchange is not a sign of an unstable signal but the expected consequence of the fact that principal components are identified only up to an orthogonal rotation of the loadings within an eigenspace. When two eigenvalues are close, the individual axes PC_1 and PC_2 are not separately well defined, whereas the plane they span is. That plane is essentially preserved across breaks (principal-angle cosines 1.00 and 0.93 on the first two directions), so the PC_1 - PC_2 interchange can be undone by a rotation rather than reflecting genuine movement of the median configuration.

To ensure comparability across breakpoints, we align the 2015 loading matrix with its 2010 counterpart using an orthogonal Procrustes rotation. We seek the orthogonal matrix R that minimizes $\|L_A - L_B R\|$ between the 2010 loadings L_A and the 2015 loadings L_B (reflections allowed, since eigenvector signs are arbitrary); with $L'_B L_A = U \text{diag}(w) V'$ the solution is $R = UV'$, and the 2015 scores are expressed in the rotated basis as $S_B R$. Within the shared leading plane, the realignment is essentially exact, i.e., the principal-angle cosines are 1.00 and 0.93 (angles of about 0 and 21 degrees). The only genuine residual is on the third axis, whose cosine is 0.78 (about 39 degrees) and which no rotation can remove; the rotated loadings show this residual is a temperature reweighting, MaxT and MinT exchanging their weight on the axis between breaks (the MaxT loading falls from 0.36 in 2010 to 0.02 in the realigned 2015 basis while MinT rises from 0.06 to 0.47, with a smaller shift in hail), whereas precipitation and fire are stable. The apparent median instability is therefore a labeling artifact of the near-degenerate leading plane, removable by rotation, with a small, physically specific residual, i.e., a genuine max/min temperature reweighting on the third axis. The *IQR* requires no such treatment, its axes being stable across breaks ($|\varphi| = 0.99$). We plot the scatterplots for the realigned *MED* scores in Figure A12, while the scatterplots for the *IQR* in Figure A13 show the actual scores.

We report the component-level driver decomposition (independent of realignment) for the 2015 break in Figure A11. As shown in Figure A11 (in contrast to Figure 6 in the main text), the qualitative result of the component-level driver decomposition is fully robust for both *MED* and the *IQR*. For *MED*, no hazard column is uniformly red or blue under either break, so each hazard keeps its own geography, and countries with a similar overall median rise still reach it through different hazard mixes. The core membership of each

profile is also stable. The fire-driven cluster keeps its distinctive core (Croatia, France, Switzerland, Germany and Hungary are the reddest Fire cells in both breaks), with only marginal turnover (Bosnia-Herzegovina and Romania fade out, Ukraine and Norway enter). The temperature-driven profile is essentially unchanged (Spain, Slovenia, Malta, Italy, Montenegro, Croatia, Latvia and Bosnia-Herzegovina in both, joined by Lithuania in 2015), as is the precipitation-driven one (Luxembourg, Greece, the Netherlands, Finland and the United Kingdom throughout). The Balkan wind cluster (Montenegro, Albania, North Macedonia) and the eastern drought cluster (Romania, Latvia, Lithuania, Poland) likewise persist, the latter broadening westward (Germany, France, Switzerland, Luxembourg) while Ukraine’s drought signal weakens. The hail profile is the most reshuffled. A stable Mediterranean-Alpine-Baltic backbone (Spain, Montenegro, Switzerland, Lithuania, Estonia, Bulgaria), but with appreciable turnover at the margin (Cyprus and Albania fade; Slovenia, Bosnia-Herzegovina, Latvia, Croatia, and Italy strengthen). The pattern of change is exactly the one anticipated by the principal-components analysis: the leading subspace of *MED* is preserved while its internal basis rotates. Hence, the existence and broad geography of the hazard mixes are break-invariant, whereas the assignment of individual borderline countries to a specific driver is not.

Concerning the *IQR*, results are similar, and, if anything, sharper, consistent with the volatility axes not rotating between breaks. No hazard column is uniform, so each hazard keeps its own volatility geography, and the cores are stable in both existence and membership. The Fire-volatility core is the most distinctive. France, Croatia and Switzerland carry the deepest Fire cells in both breaks, with Germany strengthening in 2015. MaxT volatility is dominated by Spain throughout, the single most extreme cell in either panel, alongside a northern-continental set (Finland, the Baltics, Romania). The Adriatic countries (Slovenia, Montenegro, Italy) form a persistent Drought-volatility core. Serbia and Switzerland a persistent Hail-volatility core, set against a maritime periphery (the Netherlands, the United Kingdom, Ireland) whose Hail dispersion contracts in both breaks. A MinT widening set (the Netherlands, Ireland, Andorra, Estonia, Latvia) persists across breaks. Unlike the median, it is the assignment of individual countries, and not only the broad geography, that is also stable for dispersion, because the *IQR* eigenvectors do not swap.

Because the two panels share a common country ordering, they can be read row by row, and the comparison confirms that the level and the dispersion maps are not redundant. They coincide only on the continental-Alpine Fire block, i.e., France, Croatia, Switzerland and, by 2015, Germany are hot on Fire in both the *MED* and the *IQR*, so this is the one region where a rising level and a widening spread reinforce each other. Elsewhere, the two panels diverge: the maritime and northern periphery is largely quiet in the median yet shows selective dispersion changes in the *IQR* (a widening MinT spread, a contracting Hail spread), while several continental countries that rise in level show little additional dispersion. A country’s position in the level map is thus a poor guide to its position in the dispersion map, which is precisely why the risk (*MED*) and uncertainty (*IQR*) indicators must be read jointly rather than as substitutes.

The risk-zone maps, which collapse each country’s three-mode octant into the five-zone taxonomy, confirm the robustness of the results to the break (Figure A14). On the uncertainty (*IQR*) side (right panel), the geography is highly robust. The Z1 multi-hazard core is a continental-Alpine block under both breaks (France, Switzerland, Croatia, Slovenia and Bosnia-Herzegovina). The Atlantic periphery stays Z4 storm/fire-led. The eastern march stays Z3 thermo-arid. The one substantive shift is an enlargement of the core in

2015 that absorbs Germany and Austria into Z1 and moves Norway and Denmark from Z4 to Z2. After realignments, the median geography (left panel) is broadly comparable across breaks, i.e., an active continental-Adriatic interior (France, the Adriatic arc, the Iberian peninsula) against a quiet Nordic-Atlantic periphery, with the residual differences reflecting movement of a few borderline countries.

The maps also restate how the level-versus-uncertainty contrast behaves. At the 2010 break, the two moments differ markedly. The IQR carries a compact continental-Alpine Z1 core (France, Germany, Switzerland and the Adriatic arc) that the median lacks, and the northern periphery is Z4 in the IQR but Z5 quiet in the median. Crucially, this difference does not fade at the 2015 break. After MED realignment, its Z1 set stays confined to the Franco-Adriatic axis. In contrast, the IQR core spreads across the whole Franco-German-Alpine block; most visibly, Germany is a multi-hazard Z1 in the dispersion but only thermo-arid Z3 in the level. The distinction between risk and uncertainty is therefore robust across both breaks, i.e., the two moments remain non-redundant, and their geographies genuinely distinct, rather than a single signal viewed twice.

Convergence analysis Finally, we assess the robustness of the convergence analysis along three axes. First, estimation method. Re-running it with the pooled Melly-Pons fixed-effects estimator in place of the per-country GETS (Tables 3 and A3-A) leaves every qualitative conclusion unchanged. For E3CI, the level of both risk and uncertainty diverges under either estimator (median $R_m = 3.5$ under GETS, 3.6 under FE; IQR $R_m = 2.1$ and 3.3), MaxT leads the level divergence throughout ($R_m \approx 6-7$ on the median), and the volatility of *MED* and *IQR* both diverge, led by Fire and MaxT. Most importantly, the single convergence result, the volatility of the *MED/IQR* ratio, survives the change of estimator, with $R_v = 0.63$ under GETS and 0.89 under FE and a significantly negative $\beta_v \approx -1$ in both. Second, breakpoint. Repeating the exercise at the 2015 break under both estimators (Table A3-B) reproduces the same pattern: divergence of the level and the volatility of risk and of uncertainty, MaxT-led level divergence, Fire-led volatility divergence, and a converging ratio volatility ($R_v = 0.82$ under GETS, 0.95 under FE). Third, ratio aggregation. Computing the relative indicator by the mean-of-ratios rather than the ratio-of-means (Table A3-C) leaves its level divergence intact across both breaks and both estimators ($R \approx 1.6-2.0$ for E3CI).

Taken together, the robustness exercises consistently reinforce the main conclusions of the convergence analysis. None of the alternative estimators, breakpoint dates, or aggregation schemes alter the qualitative pattern of results. Climate risk and climate uncertainty continue to diverge across countries, maximum temperature remains the dominant contributor to long-run risk divergence, wildfire remains the principal driver of volatility divergence, and only the volatility of the relative risk indicator exhibits systematic convergence.

A4 Economic effects: robustness analysis

Tables 4-7, A4-A and A6-A/B/C report the estimates obtained using the Melly-Pons climate measures. In contrast, the corresponding specifications based on the per-country GETS estimates are reported in the companion core tables (A4-FS to A7-FS) and in Tables A4-C, A4-D and A7-A/B/C. Table A5-A/B/C compares the coefficients on the

macroeconomic controls under the two constructions. The comparison considers the sign and statistical significance of the estimated climate effects, the stability of the transmission mechanism, and the identification of the instrumental-variable corrections. Table A8 in the Online Appendix summarizes the comparison and includes all figures cited below.

As mentioned, we retain the pooled and per-country GETS approaches as co-equal specifications when the object of interest is cross-country heterogeneity. For the aggregate macroeconomic analysis, however, the relevant object is the European conditional moment rather than the country-specific moment, and the bias-variance trade-off consequently favors the pooled Melly-Pons estimator. The pooled model exploits the full panel and identifies the common conditional moments from substantially more information than is available in the $T=44$ observations of any individual country. Averaging country-specific GETS estimates can instead introduce additional first-stage estimation variance into the aggregate measure. We therefore use the Melly-Pons measures as the benchmark for the macroeconomic impact estimates and the per-country GETS measures as a robustness check on signs, significance, and incidence.

Robustness of the Estimated Effects The results provide strong evidence of robustness. In the symmetric specifications, the estimated sign coincides in all 100 of the coefficients that are statistically significant under both constructions, corresponding to full sign concordance under the preferred GTS-FE estimator; concordance is equally complete for the FE estimator (107 of 107 doubly significant coefficients). The bias-corrected BC-FE estimates serve a different purpose. They gauge the sensitivity of the point estimates to Nickell bias, but their conventional standard errors do not embody the Driscoll-Kraay correction for cross-sectional dependence; they are roughly half the size of the corrected ones and are therefore downward biased and not used for inference. Judged on the point estimates alone, the BC-FE coefficients carry the same sign under the two constructions in every cell that is doubly significant under the preferred estimator, and unconditional sign concordance over all 336 cells is essentially identical across the three estimators, at 88-89%. At the level of the 28 headline cells for the composite index, fourteen dependent variables and two climate channels, the significance outcome coincides in 25 cases; the three exceptions concern the labor share, the unemployment rate, and the entry margin under the risk specification, which become marginally significant when using the per-country measures. Across the full set of 336 symmetric cells, the significance valuation is the same in 81% of cases. When it differs, the discrepancy is directional: 49 cells are significant only under the per-country measures, whereas 16 are significant under the pooled measures.

The asymmetric specifications yield a similar assessment. Across the 4,704 cells of Tables A6-A/B/C and A7-A/B/C, the estimated sign coincides in 920 of the 921 cells that are statistically significant under both constructions, corresponding to 99.9% sign concordance, with perfect agreement for the risk and relative-risk moments taken separately and in six of the seven partitions. The single reversal arises in the uncertainty moment. It concerns the dispersion of MinT for the real consumption wage in the more-mitigation half, the component for which the two first-stage constructions agree least and a partition that displays no systematic asymmetry under either approach. The significance outcome coincides in 86% of the cells. Where it differs, the discrepancy is directional rather than substantive: 448 cells are significant only under the per-country measures, compared with 231 under the pooled ones. If anything, therefore, the benchmark specification provides a conservative representation of the asymmetries identified by the alternative construction.

The additional significant cells do not overturn the incidence structure documented in the main text, but indicate that the alternative construction detects a somewhat broader set of asymmetries.

Stability is not an artifact of differences in the second-stage specification, which is essentially identical across the two constructions. Table A5 shows that the coefficients on the macroeconomic, financial, and uncertainty controls, the business-cycle terms, the autoregressive component, and the goodness-of-fit are numerically very similar. For example, in the real-GDP specification conditioned on E3CI uncertainty, the coefficients on economic uncertainty, geopolitical risk, financial stress, the business-cycle indicator, the autoregressive term and R^2 move from -0.471, -0.230, -0.317, -4.243, 0.274 and 0.335 to -0.510, -0.234, -0.313, -4.322, 0.283 and 0.329, respectively. Similar stability holds throughout the remaining panels. Differences in the estimated climate effects therefore originate from differences in the climate regressors rather than from changes in the underlying macroeconomic relationship. The per-country climate coefficients are generally somewhat larger in absolute value, consistent with the greater estimation variability associated with country-by-country model selection and subsequent averaging.

The transmission mechanism is equally stable. Under both constructions, we find the largest response for labor productivity, with the real product wage absorbing most of the productivity loss; output and consumption respond in the same direction, while employment, hours worked, and the real wage wedge remain statistically insignificant, as does investment in the aggregate specifications. Similar findings hold for the component-level assessment: six of the eight climate components generate significant effects on real GDP and seven of eight on the real product wage under both constructions. The core transmission mechanism identified, i.e., an adverse productivity shock transmitted primarily through real wages rather than through labor utilization, is therefore not specific to the pooled construction, and neither is its incidence, since the vulnerability gaps across the income, institutional and longitudinal partitions retain both their sign and their relative magnitude.

The few sign instabilities are highly concentrated and originate from differences in the first-stage climate measures rather than from systematically different macroeconomic responses. No sign reversal occurs among the doubly significant symmetric cells under either the GTS-FE or the FE estimator. Sign flips in the point estimates are confined to MinT, for consumption growth, the real consumption wage, the unemployment rate, and the entry margin under the uncertainty and relative-risk measures, but in no case are the two coefficients involved simultaneously significant under the corrected inference, so these flips carry no inferential weight. In the asymmetric specifications, the single reversal among the doubly significant cells likewise occurs within the MinT uncertainty measure.

As discussed in Section A2, the relative-risk series for Fire and MinT exhibit some discrepancies, mainly due to their cyclical dynamics. For Fire, these first-stage differences leave no trace in the second stage, yet they do for MinT. For MinT, all sign instabilities documented above concern this component, and the discrepancy extends to the significance of the uncertainty response for labor productivity. The per-country GETS measure yields a positive and statistically significant coefficient, whereas the pooled measure produces a small and statistically insignificant negative coefficient. We interpret these isolated differences as reflecting first-stage estimation differences, particularly the additional sampling and model-selection variation inherent in the per-country GETS estimates. Given the close agreement between the two constructions elsewhere, the absence

of reversals under the preferred estimator, and the greater stability of the pooled estimates, we retain the Melly-Pons measures as the benchmark representation for the MinT channels.

Generated Regressors and IV Estimation The climate measures entering the second-stage macroeconomic regressions are estimated rather than directly observed and therefore constitute generated regressors. They are of the predictor type analyzed by Pagan (1984). The fitted conditional moments replace the latent ones, and the first-stage prediction error is orthogonal to the fitted values by construction. Two consequences follow. First, the second-stage coefficients remain consistent, so the point estimates reported in the benchmark tables are not downward biased. This property distinguishes the present setting from classical measurement error, where attenuation arises. Second, the conventional second-stage variance is not consistently estimated. It converges to the variance of the structural disturbance alone. It omits the contribution of the first-stage sampling error scaled by the squared coefficient. Hence, the reported standard errors are generally too small, overstating the statistical significance of the estimated effects. The distortion is proportional to the squared coefficient. It therefore vanishes under the null hypothesis of no climate effect, in which case the conventional variance estimator is consistent, and the associated test retains its nominal size (Pagan, 1984, Theorem 3). The two-stage procedure consequently affects the width of the confidence intervals and any inference about the magnitude of the effects. Still, not the decision to reject or fail to reject the absence of an effect, which is the object of the significance markings reported throughout the tables. The remaining question is the empirical size of the distortion, which the diagnostic evidence below addresses directly.

The diagnostic evidence directly assesses the empirical importance of this concern. Table A4-B reports Durbin-Wu-Hausman tests for the pooled Melly-Pons measures. Exogeneity is not rejected at the 5% level in 87% of the 672 cells, with a median p-value of 0.33. At the 1% level, rejection occurs in only four cells, or 1% of the total, a frequency consistent with the test’s nominal size under the null. None of these rejections occurs in the uncertainty specifications, while twelve of the fourteen dependent variables record no rejection at this level. Even at the 5% level, rejections in the uncertainty channel occur in only 7% of the cells. For real GDP, the smallest p-value across all eight hazards is 0.141, whereas we find no rejections for employment, hours worked, the labor share, or the labor force. The main exceptions are labor productivity and the real product wage, for which rejection rates reach 44% and 33%, respectively, and concentrate in the median-based measures; these are also the outcomes for which the estimated effects are largest and most precisely determined. Overall, the evidence provides little indication of systematic endogeneity in the benchmark climate measures, although it does not rule out residual generated-regressor uncertainty.

The coefficient estimates provide a complementary check. In Table A4-A, the FE-IV and GTS-FE-IV specifications reproduce the signs and statistical significance of the corresponding uncorrected estimates, while the point estimates change only modestly. For real GDP under E3CI uncertainty, for example, the coefficient moves from -0.268 to -0.241. For labor productivity, from -0.448 to -0.403. For the real product wage, from -0.341 to -0.312, with standard errors of comparable magnitude. The IV correction therefore produces only limited changes in the benchmark coefficients, suggesting that first-stage measurement error has little quantitative effect on the estimated transmission mechanism.

The comparison with the per-country GETS construction provides a further check. The two climate measures originate from substantially different estimation procedures, pooled panel estimation in the Melly-Pons case and country-by-country model selection and estimation in the GETS case, and nevertheless generate full sign concordance among coefficients that are statistically significant under both approaches. Because the procedures introduce different estimation-specific sources of variation, this stability provides evidence that a particular first-stage estimation procedure does not drive the principal second-stage findings. The two measures, however, should not be regarded as having independent measurement errors. Both are ultimately constructed from the same underlying climate observations and may therefore share common sampling variation.

An additional consideration is that we average the per-country GETS estimates across countries before entering them in the aggregate macroeconomic regressions. If the country-specific estimation errors are approximately independent and mean-zero, this averaging reduces their contribution to the variance of the aggregate measurement error at a rate approaching $1/N$. It does not eliminate the problem, because the country-specific estimates are based on the same underlying climate observations and may contain common components of estimation error. Nevertheless, it provides an additional reason why the aggregate GETS measures constitute a useful robustness check for the pooled Melly-Pons measures. The per-country estimates, however, should not be regarded as automatically superior to generated-regressor corrections. Their country-specific flexibility is valuable for identifying heterogeneity, but it can also introduce additional estimation variance when the object of interest is a common European climate moment. The pooled Melly-Pons measures therefore remain the preferred benchmark.

The availability of two estimates of the same latent climate moments also permits a measurement-error IV exercise. One estimated measure can serve as an instrument for the other, exploiting the standard logic that an alternative estimate of the same latent moment can recover a variance estimator that incorporates the first-stage sampling error. This strategy requires instrument relevance and, more importantly, an exclusion restriction. Conditional on the true climate moment and the controls, the instrument must affect the macroeconomic outcome only through the climate regressor. The latter condition cannot be established directly in this setting, because the two measures exploit the same underlying climate observations. Therefore, we use the IV exercise as a diagnostic rather than as a definitive correction for the understatement of the second-stage standard errors.

The diagnostic evidence confirms that this correction is not uniformly reliable across hazards and constructions. The alternative measure is generally a weaker instrument when the climate moments exploit the country-specific GETS estimates, which contain less information about the common conditional moment. For real GDP, for example, the Kleibergen-Paap underidentification p-value rises from 0.116 to 0.429 for MinT and from 0.232 to 0.323 for Hail when moving from the pooled to the per-country construction, and Drought remains unidentified under both approaches, with p-values of 0.609 and 0.511. Overall, the instrument is identified in 83% of the cases in Table A4-B, compared with 70% in Table A4-D. The exogeneity diagnostics point in the same direction. Rejection occurs in 29% versus 21% of cases at the 10% level, 18% versus 13% at the 5% level, and 2% versus 1% at the 1% level, with median p-values of 0.21 and 0.33, respectively. For labor productivity, rejection occurs at $p=0.007$ for the E3CI median and, in the uncertainty channel, at $p=0.034$ for Prec and $p=0.038$ for MinT. The IV correction is therefore sensitive to the construction of the underlying climate measures and is not

sufficiently stable to replace the benchmark estimates.

The IV results are consequently used primarily as diagnostic evidence rather than as a preferred alternative set of point estimates. Their main contribution is twofold. First, the exogeneity tests provide little evidence of systematic endogeneity for the pooled Melly-Pons measures, particularly for the uncertainty specifications, the paper’s central contribution. Second, the IV-corrected coefficients remain close to the benchmark estimates wherever the instruments are sufficiently informative. Taken together with the high sign concordance across the pooled and per-country constructions, this evidence indicates that first-stage estimation error is unlikely to drive the principal second-stage findings. It supports using the pooled Melly-Pons measures as the benchmark representation of the climate moments. More broadly, the robustness exercise shows that all the paper’s central conclusions about the nature of the transmission mechanism of climate risk and uncertainty, and their heterogeneous economic incidence, governed by countries’ capacity to absorb the shock, are not an artifact of the particular first-stage procedure used to construct the climate measures.

A5 Financial effects: robustness analysis

Table 8 reports the exposures estimated with the benchmark Melly-Pons FE climate measures at the annual frequency; Table A9 reproduces the same specifications with the per-country GETS measures, and Tables A10-A/B and A11-A/B report both constructions at the quarterly and monthly frequencies. The two constructions deliver remarkably similar point estimates. In the full-sample column of the annual tables, the estimated sign coincides in 92% of the 120 cells, with per-factor agreement of 96% for MKT and HML, 100% for CMA, 88% for SMB, and 83% for RMW. Among the cells that are statistically significant under both constructions, sign concordance is complete in every column and at every frequency. The differences therefore concern statistical significance rather than the estimated exposures, and they are directional. At the annual frequency, eight cells are significant only under the per-country measures, versus four under the pooled ones, a result that is unsurprising given the limited sample size and the resulting sensitivity of marginal coefficients.

The evidence for the value factor (HML) is particularly robust. The negative loading on the Fire component remains statistically significant under both constructions, in both the bivariate and the trivariate specifications, and at all three frequencies, with nearly identical magnitudes. For the uncertainty measure, the pre-agreement coefficients equal -0.087, -0.019 and -0.007 under fixed effects, against -0.082, -0.019 and -0.007 under GETS at the annual, quarterly and monthly frequencies, respectively, and the corresponding relative-risk estimates are equally close (-0.053, -0.012 and -0.004 versus -0.059, -0.014 and -0.005). The negative loading on the MaxT absolute-risk measure is also confirmed (-0.055 versus -0.059). The post-agreement effect is never significant for HML. Across the twenty-four specifications, no post-agreement sum is significant for either estimator or frequency, and the interaction term is significant in a single per-country cell. The absence of a significant exposure for the market factor (MKT) is likewise confirmed throughout.

The GETS construction identifies an additional set of significant MinT loadings that remain below conventional thresholds in the benchmark: positive for HML (+0.076) and CMA (+0.046) under the uncertainty measure, negative for RMW (-0.025), and, under the risk-relevant sign convention, negative for HML (-0.055) and CMA (-0.039) under the

absolute-risk measure, the two loadings discussed in the main text. These are not sign reversals: the direction coincides in 26 of the 30 annual MinT cells and in every cell that is significant under the per-country construction, the difference lying in the magnitudes, with the GETS estimates up to three and a half times larger against comparable standard errors, so that only the latter attain conventional significance levels. We therefore read the MinT evidence as suggestive rather than conclusive, consistently with the treatment of this component in the economic analysis.

A small number of results are instead estimator-specific. The negative HML loadings on Drought (-0.065) and Wind (-0.069) uncertainty lose significance under the GETS construction, implying that Fire is the only component whose uncertainty is consistently associated with the value spread across both methodologies. The post-agreement pattern for SMB holds only partially. We confirm the negative loading on MaxT uncertainty (-0.035 against -0.043). In contrast, the positive loadings on Drought uncertainty and Wind risk disappear and a positive loading on Fire relative risk (+0.103) appears in their place. Finally, the modest positive full-sample loading of RMW on the Fire component is not confirmed. Under GETS, the significant profitability loadings are negative and concern the MinT and precipitation components.

Coherence across sampling frequencies is strong in the trivariate specification and weaker in the bivariate one. In the trivariate column, sign consistency across annual, quarterly, and monthly estimates reaches 79% under fixed effects and 85% under GETS, and annually significant loadings recur at both intra-year frequencies in seven of eight and eleven of eleven cases. In contrast, the bivariate specification exhibits sign coherence of only about two-thirds. Since intra-year regressions mechanically hold annual climate measures fixed within the year, this coherence serves as a diagnostic of specification robustness, not as independent evidence. Its failure would have signaled instability. On balance, the specifications are stable.

Taken together, Tables 8 and A9-A11 indicate that the estimated climate-factor exposures are largely robust to the construction of the climate measures and to the sampling frequency. The most robust result is the negative exposure of the value factor to wildfire uncertainty and relative risk; the evidence for SMB, RMW and CMA is less stable across constructions and is suggestive rather than conclusive, warranting further investigation.

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Table A1-A: Model selection analysis

Panel A: Pre-correction quantile-crossing rate (% country-years)						
	Unr. S	Unr. D	GETS S	GETS D	FE S	FE D
E3CI	17.10	20.23	7.73	8.47	11.82	11.82
MaxT	18.69	21.88	8.98	11.02	11.70	13.58
MinT	16.14	22.05	4.32	4.89	11.99	12.27
Drought	17.78	21.42	4.38	4.38	8.07	13.81
Prec	18.24	21.82	6.19	6.36	9.15	10.28
Wind	17.56	21.99	4.32	5.06	6.93	10.68
Fire	21.19	22.16	9.38	11.76	14.15	15.85
Hail	17.50	20.57	5.06	4.55	9.66	9.66

Panel B: Rolling losses						
	Unr. S	Unr. D	GETS S	GETS D	FE S	FE D
E3CI	0.19	0.20	0.13	0.15	0.11	0.12
MaxT	0.47	0.50	0.35	0.38	0.27	0.28
MinT	0.24	0.27	0.14	0.17	0.15	0.15
Drought	0.41	0.44	0.22	0.26	0.24	0.24
Prec	0.22	0.22	0.14	0.15	0.12	0.12
Wind	0.23	0.25	0.14	0.16	0.13	0.12
Fire	0.90	1.41	0.72	1.23	0.62	0.63
Hail	0.23	0.24	0.14	0.16	0.13	0.14

The Table reports, in Panel A, the pre-correction quantile-crossing rate (percentage of country-years) and, in Panel B, the average pinball loss from the rolling one-step-ahead forecasting exercise over 2012-2024. The model comparison evaluates the minimum-distance FE estimator of Melly and Pons (2025) with GETS selection at the median (FE S, FE D), the per-country unrestricted model, as delivered by the first stage in the Melly-Pons estimator (Unr. D and Unr. S), which contain the full set of conditioning regressors, the per-country GETS procedure with selection at the median (GETS D and GETS S). For both the Melly-Pons GETS FE and the per-country GETS estimators the selection at the median retains only the significant trigonometric and lag components while conditioning on the complete set of natural oscillators, using both dynamic and static initial specifications. The series are the E3CI index and its seven components (MaxT, MinT, Drought, Prec, Wind, Fire, Hail).

Table A1-B. Sign concordance of driver effects: FE (Melly-Pons, Table 2) vs. per-country GETS.

Panel A — Risk (effect on the conditional median, $\tau = 0.5$)								
Driver	E3CI	MaxT	MinT	Drought	Prec	Wind	Fire	Hail
AGGI (trig.)	✓	✓	✓	(✓)	✓	✓	✓	(✓)
AMO	+	+	·	−a	·	+~	·	+a
NAO	+	+	−	+	−	+a	+	−
SOI	−	−	·	+	−	·	+a	·
SI	·	+	−	−	+	·	−a	−

Panel B — Uncertainty (effect on the IQR)								
Driver	E3CI	MaxT	MinT	Drought	Prec	Wind	Fire	Hail
AGGI (trig.)	+	+	±	·	+	±	+	·
AMO	·	·	·	·	·	·	·	·
NAO	+	·	−	·	·	+~	+~	+
SOI	·	−	·	+	·	·	+	·
SI	·	·	·	·	·	·	+	·

Each entry is the common sign of both estimators (FE and per-country GETS). + / − = significant ($\leq 10\%$) and of that sign in the FE model and confirmed by the GETS cross-country median; · = not significant. ~ = sign agrees but the GETS cross-country band is wide (weaker robustness). Signed entries with the superscript a report the sign of an effect that is insignificant at the conditional median but significant at another quantile. For AGGI (a Fourier block rather than a single coefficient): ✓ = significant trigonometric loading; (✓) = present but sparser / higher-order. In Panel B, + = net widening of the IQR, ± = significant but mixed-sign (non-widening), · = no significant trigonometric term. a Insignificant at the median quantile in the FE model but significant at another quantile, with the sign shown (AMO: Drought negative at the first quartile, Hail positive; NAO: Wind and SOI: Fire at the upper quantile; SI: Fire), and the GETS cross-country median concordantly weak. Indicators: E3CI and its seven components (MaxT, MinT, Drought, Prec, Wind, Fire, Hail). Drivers: AGGI = anthropogenic forcing (Fourier cosine/sine terms); AMO, NAO, SOI (ENSO), SI (solar irradiance).

Table A2. Principal components analysis of the post/pre change in climate-risk moments: Breakpoints 2010 and 2015.

Breakpoint 2010

Panel A: Principal Component Analysis - E3CI index

	eigv	prop	cum
PC1	2.05	0.68	
PC2	0.83	0.28	0.96
PC3	0.12	0.04	1.00
	PC1	PC2	PC3
IQR	0.48	0.78	0.40
MED	0.67	-0.04	-0.74
MED/IQR	0.56	-0.63	0.54

Panel B: Principal Component Analysis - E3CI index components

	IQR			MED			MED/IQR		
	eigv	prop	cum	eigv	prop	cum	eigv	prop	cum
PC1	1.83	0.26		1.70	0.24		1.92	0.27	
PC2	1.35	0.19	0.45	1.47	0.21	0.45	1.32	0.19	0.46
PC3	1.12	0.16	0.61	1.14	0.16	0.62	1.06	0.15	0.62
	PC1	PC2	PC3	PC1	PC2	PC3	PC1	PC2	PC3
MaxT	0.46	0.28	-0.30	0.29	0.55	0.36	0.31	0.49	-0.23
MinT	0.06	-0.64	-0.25	0.40	0.14	0.06	-0.47	0.18	0.03
Drought	0.42	-0.30	0.32	0.48	0.16	-0.38	-0.43	0.26	-0.40
Prec	-0.20	0.38	-0.49	-0.42	-0.08	0.57	0.42	-0.53	0.06
Wind	-0.41	-0.03	0.56	-0.18	0.58	0.19	0.50	0.40	-0.13
Fire	0.19	0.53	0.43	0.47	-0.15	0.55	-0.23	-0.04	0.56
Hail	0.60	0.00	0.11	-0.29	0.54	-0.24	0.12	0.47	0.68

Breakpoint 2015

Panel A: Principal Component Analysis - E3CI index

	eigv	prop	cum
PC1	1.93	0.64	
PC2	0.95	0.32	0.96
PC3	0.12	0.04	1.00
	PC1	PC2	PC3
IQR	0.46	0.77	0.44
MED	0.70	-0.01	-0.72
MED/IQR	0.55	-0.64	0.54

Panel B: Principal Component Analysis - E3CI index components

	IQR			MED			MED/IQR		
	eigv	prop	cum	eigv	prop	cum	eigv	prop	cum
PC1	1.86	0.27		1.71	0.24		1.79	0.26	
PC2	1.37	0.20	0.46	1.45	0.21	0.45	1.42	0.20	0.46
PC3	1.11	0.16	0.62	1.05	0.15	0.60	1.10	0.16	0.62
	PC1	PC2	PC3	PC1	PC2	PC3	PC1	PC2	PC3
MaxT	0.47	0.27	-0.33	0.59	0.12	-0.03	0.45	0.29	0.37
MinT	-0.03	-0.63	-0.30	0.20	-0.42	0.53	-0.44	0.22	-0.22
Drought	0.45	-0.37	0.27	0.19	-0.47	-0.44	-0.37	0.28	0.66
Prec	-0.25	0.40	-0.31	-0.35	0.37	0.47	0.14	-0.67	-0.06
Wind	-0.30	-0.07	0.70	0.30	0.42	0.13	0.56	0.11	0.25
Fire	0.22	0.48	0.36	0.29	-0.35	0.53	-0.15	0.34	-0.21
Hail	0.62	-0.01	0.13	0.52	0.39	-0.05	0.34	0.46	-0.52

The table reports a principal components analysis (PCA) run on the cross-country, standardized post/pre changes (z-scores) of the relevant series, considering two breakpoints, i.e., 2010 and 2015. Panel A reports results for the E3CI uncertainty (IQR), risk (MED), and relative-risk (MED/IQR) measures across the countries. Panel B reports results for each of the three measures one at a time, for the seven E3CI components. For every PC, “eigv”, “prop” and “cum” give the eigenvalue, the proportion of total variance explained, and the cumulative proportion; the lower block of each panel reports the loadings of the original variables on the first three components.

Table A3-A: Convergence analysis (Melly-Pons fixed-effects FE) - Breakpoint 2010

Index	Sigma-convergence						Beta-convergence					
	IQR		MED		MED/IQR		IQR		MED		MED/IQR	
	m	v	m	v	m	v	m	v	m	v	m	v
E3CI	3.271	2.200	3.630	2.788	1.901	0.889	-0.101 (0.515)	-0.357 (0.424)	0.762 (0.762)	-0.442 (0.528)	-0.194 (0.430)	-1.026 (0.117)
MaxT	3.907	2.866	7.251	3.244	5.168	1.458	-0.199 (0.864)	-0.173 (0.444)	0.346 (1.223)	-1.508 (0.394)	0.730 (0.852)	-1.051 (0.348)
MinT	1.727	1.265	2.592	0.843	4.823	1.322	-0.716 (0.228)	-0.666 (0.189)	-0.998* (0.597)	-1.013 (0.143)	-1.281 (0.829)	-1.048 (0.081)
Drought	1.363	1.480	1.901	1.279	1.843	1.265	-0.130 (0.227)	-0.172 (0.253)	-0.195 (0.311)	-0.325 (0.211)	-0.214 (0.278)	-0.395 (0.192)
Prec	2.408	1.184	4.201	1.156	3.588	1.085	-0.763 (0.160)	-0.195 (0.288)	-0.939 (0.811)	-0.173 (0.164)	-1.109 (0.696)	-0.721 (0.202)
Wind	1.394	1.405	3.398	1.792	2.887	1.419	-0.304* (0.178)	-0.363* (0.219)	-0.567 (0.543)	-0.173 (0.272)	-0.691 (0.294)	-0.476 (0.193)
Fire	4.218	4.149	1.425	3.789	0.577	0.757	1.187 (0.324)	0.636 (0.096)	0.273 (0.092)	0.400 (0.366)	-0.837 (0.014)	-0.927 (0.015)
Hail	2.007	1.432	2.043	1.104	1.806	0.887	-0.876 (0.331)	0.191 (0.122)	-0.337 (0.334)	-0.051 (0.167)	-0.663 (0.278)	-1.042 (0.171)

The table reports the convergence statistics for the E3CI index and its components, estimated with the Melly-Pons fixed effects (FE) estimator, at breakpoint 2010. Columns labelled m report the level statistic (ratio-of-means); columns labelled v the volatility statistic. For sigma-convergence each entry is the post-to-pre standard-deviation ratio (values below one indicate convergence). For beta-convergence each entry is the slope of the post-minus-pre mean on the pre-break level, with the standard error in parentheses (a negative slope indicates convergence). Bold figures denote statistical significance at the 10% level or better; those marked with an asterisk are significant at the 10% but not at the 5% level.

Table A3-B: Convergence analysis - Breakpoint 2015

Panel A: Sigma-convergence

	Melly-Pons fixed-effects (FE)						Per-country GETS					
	IQR		MED		MED/IQR		IQR		MED		MED/IQR	
	m	v	m	v	m	v	m	v	m	v	m	v
E3CI	3.788	1.535	3.997	1.946	2.195	0.955	2.453	1.623	4.097	4.209	2.159	0.823
MaxT	4.675	2.800	6.018	2.405	5.829	1.743	3.380	1.450	6.232	2.826	5.419	1.436
MinT	1.791	1.472	2.955	1.063	5.430	1.744	1.417	0.987	2.349	0.685	4.528	1.280
Drought	1.653	1.354	2.337	1.462	2.210	1.549	1.562	1.482	2.175	1.506	1.867	1.339
Prec	3.069	0.954	5.112	1.357	3.592	1.305	2.111	1.565	5.568	1.807	4.167	1.165
Wind	1.742	1.468	4.613	1.205	4.029	1.285	1.587	1.297	3.934	0.810	3.021	0.939
Fire	4.881	3.059	1.592	2.825	0.596	0.684	3.814	3.166	1.796	5.950	1.065	0.893
Hail	2.949	1.266	2.031	1.029	1.898	1.118	1.782	2.016	2.509	1.319	1.988	0.880

Panel B: Beta-convergence

	Melly-Pons fixed-effects (FE)						Per-country GETS					
	IQR		MED		MED/IQR		IQR		MED		MED/IQR	
	m	v	m	v	m	v	m	v	m	v	m	v
E3CI	0.325 (0.656)	-0.270* (0.160)	1.263 (0.416)	-0.247 (0.215)	0.599 (0.778)	-1.071 (0.161)	0.367 (0.245)	-0.086 (0.358)	0.578 (0.734)	-0.932 (0.195)	-0.025 (1.219)	-1.013 (0.103)
MaxT	0.435 (0.759)	-0.193 (0.532)	2.397 (1.016)	0.066 (0.507)	0.427 (0.693)	-0.758 (0.333)	0.271 (0.246)	0.068 (0.166)	1.300 (1.207)	-0.656* (0.344)	-0.168 (0.620)	-1.075 (0.130)
MinT	0.048 (0.450)	0.008 (0.390)	-0.133 (0.575)	-1.002 (0.199)	0.321 (0.514)	-1.050 (0.106)	-0.563 (0.144)	-0.340 (0.088)	-0.135 (0.318)	-0.988 (0.100)	0.391 (0.460)	-0.362 (0.358)
Drought	-0.077 (0.261)	-0.215 (0.173)	-0.032 (0.387)	-0.027 (0.201)	-0.071 (0.431)	-0.236 (0.295)	-0.102 (0.240)	0.361 (0.521)	-0.161 (0.304)	0.074 (0.226)	-0.249 (0.271)	-0.369 (0.164)
Prec	-0.453* (0.273)	-0.219 (0.172)	0.828 (1.377)	-0.199 (0.229)	0.791 (1.020)	-0.699 (0.212)	-0.110 (0.165)	-0.363 (0.161)	1.530* (0.800)	-0.347 (0.289)	1.288* (0.701)	-0.760 (0.099)
Wind	-0.430 (0.218)	-0.301 (0.267)	-0.470 (0.510)	-0.506 (0.215)	-0.686 (0.307)	-0.850 (0.304)	-0.046 (0.380)	-0.036 (0.163)	0.510 (0.337)	-0.537 (0.094)	0.262 (0.491)	-0.561 (0.099)
Fire	0.992 (0.232)	0.592 (0.089)	0.338 (0.121)	-0.001 (0.183)	-0.894 (0.015)	-0.995 (0.004)	1.141 (0.130)	-0.197 (0.244)	0.154* (0.092)	-0.167 (0.261)	-0.341 (0.114)	-0.987 (0.013)
Hail	-0.825 (0.378)	-0.320* (0.182)	-0.724 (0.534)	-0.397 (0.151)	-1.044 (0.464)	-1.145 (0.080)	-0.360* (0.193)	-0.233 (0.104)	-0.298 (0.460)	-0.331 (0.127)	-0.636* (0.355)	-0.729 (0.077)

The table reports the convergence statistics for the E3CI index and its components at breakpoint 2015, for the Melly-Pons fixed-effects (FE) and the per-country GETS estimators. Panel A reports the sigma-convergence ratios and Panel B the beta-convergence slopes. Columns labelled m report the level statistic (ratio-of-means); columns labelled v the volatility statistic. Beta entries show the slope with its standard error in parentheses. Bold figures denote statistical significance at the 10% level or better; those marked with an asterisk are significant at the 10% but not at the 5% level.

Table A3-C: Convergence analysis - MED/IQR, mean-of-ratios

Index	Melly-Pons fixed-effects (FE)				Per-country GETS			
	Sigma		Beta		Sigma		Beta	
	2010	2015	2010	2015	2010	2015	2010	2015
E3CI	1.633	1.658	-0.468 (0.287)	-0.132 (0.446)	1.753	1.960	-0.764 (0.349)	-0.615 (0.468)
MaxT	2.751	3.680	-0.925 (0.643)	-0.578 (0.710)	2.983	3.581	-0.514 (0.469)	-0.098 (0.334)
MinT	2.585	3.368	-0.889 (0.263)	-0.512 (0.320)	3.011	3.005	0.200 (0.529)	0.475 (0.403)
Drought	2.015	2.229	-0.158 (0.478)	-0.311 (0.279)	1.716	1.814	-0.873 (0.257)	-0.699 (0.313)
Prec	2.365	2.567	-0.319 (0.370)	-0.022 (0.394)	2.454	3.227	-0.687* (0.409)	-0.113 (0.621)
Wind	2.283	3.264	-1.177* (0.673)	-1.168 (0.576)	2.576	3.159	-0.167 (0.308)	0.020 (0.347)
Fire	0.622	0.661	-0.916 (0.007)	-0.877 (0.031)	1.074	1.005	-0.910 (0.015)	-0.976 (0.041)
Hail	1.395	1.658	-0.726 (0.336)	-1.117 (0.402)	1.450	1.550	-0.482* (0.291)	-1.092 (0.291)

The table reports the convergence statistics for the MED/IQR indicator computed with the mean-of-ratios approach, for the E3CI index and its components, under the Melly-Pons fixed-effects (FE) and the per-country GETS estimators, at breakpoints 2010 and 2015. The Sigma columns report the post-to-pre standard-deviation ratio; the Beta columns the convergence slope with its standard error in parentheses. Bold figures denote statistical significance at the 10% level or better; those marked with an asterisk are significant at the 10% but not at the 5% level.

Table A4-FS: The economic impact of climate uncertainty, climate risk and relative climate risk: headline estimates (E3CI; GTS-FS)

	Climate uncertainty (IQR)			Climate risk (Median)			Relative climate risk (Median/IQR)		
	GTS-FS	GTS-FS-IV	Sig./8	GTS-FS	GTS-FS-IV	Sig./8	GTS-FS	GTS-FS-IV	Sig./8
Real GDP	-0.226 (0.101)	-0.119 (0.053)	6/8	-0.215 (0.077)	-0.151 (0.045)	6/8	-0.210 (0.088)	-0.190 (0.076)	6/8
Consumption	-0.220 (0.109)	-0.116* (0.059)	4/8	-0.231 (0.074)	-0.161 (0.045)	6/8	-0.240 (0.075)	-0.217 (0.065)	5/8
Investment	-0.040 (0.190)	-0.021 (0.100)	0/8	-0.147 (0.148)	-0.102 (0.102)	0/8	-0.114 (0.149)	-0.103 (0.135)	0/8
Output per worker	-0.425 (0.060)	-0.224 (0.033)	8/8	-0.355 (0.050)	-0.248 (0.029)	8/8	-0.366 (0.068)	-0.330 (0.059)	7/8
Output per hour	-0.355 (0.081)	-0.187 (0.047)	6/8	-0.303 (0.063)	-0.212 (0.054)	7/8	-0.333 (0.069)	-0.293 (0.070)	7/8
Real product wage	-0.339 (0.076)	-0.180 (0.049)	7/8	-0.246 (0.059)	-0.181 (0.044)	7/8	-0.263 (0.060)	-0.239 (0.058)	7/8
Real consumption wage	-0.214 (0.103)	-0.114* (0.058)	3/8	-0.144* (0.080)	-0.102* (0.056)	5/8	-0.135 (0.083)	-0.122* (0.074)	4/8
Real wage wedge	0.049 (0.038)	0.026 (0.020)	1/8	0.037 (0.031)	0.027 (0.023)	1/8	0.051 (0.032)	0.046 (0.030)	2/8
Labor share	0.124 (0.117)	0.065 (0.060)	2/8	0.153* (0.090)	0.110 (0.068)	4/8	0.171* (0.093)	0.159* (0.092)	3/8
Employment	0.101 (0.066)	0.054 (0.035)	1/8	0.053 (0.047)	0.036 (0.033)	0/8	0.060 (0.044)	0.054 (0.040)	0/8
Hours per worker	-0.025 (0.099)	-0.013 (0.052)	0/8	-0.020 (0.073)	-0.014 (0.050)	0/8	-0.019 (0.074)	-0.016 (0.065)	0/8
Unemployment rate	-0.079 (0.031)	-0.042 (0.017)	3/8	-0.044* (0.025)	-0.030 (0.018)	4/8	-0.048* (0.025)	-0.043* (0.023)	6/8
Labor force	0.018 (0.042)	0.009 (0.022)	0/8	0.008 (0.034)	0.006 (0.024)	0/8	0.010 (0.034)	0.009 (0.030)	0/8
Entry margin	-0.089 (0.035)	-0.047 (0.019)	3/8	-0.050* (0.028)	-0.034* (0.021)	4/8	-0.056 (0.028)	-0.050* (0.027)	6/8

Coefficients measure the impact of a typical annual change of the E3CI composite conditional moment on the annual growth rate (or change) of each variable, from the symmetric dynamic panel with country fixed effects, macro-financial controls and Driscoll–Kraay standard errors, estimated by Autometrics general-to-specific selection (GTS-FS) and by its Pagan / realized-measure IV counterpart (GTS-FS-IV); standard errors in parentheses. Sig./8 counts the E3CI components (of eight) with a significant GTS-FS coefficient. Bold figures denote significance at the 10% level or better; an asterisk marks significance at 10% but not 5%. Full results are in the Online Appendix. Table A4-A.

Table A5-FS: Asymmetric incidence of climate uncertainty, climate risk and relative climate risk (E3CI; GTS-FS): capacity and geographic gradients

Panel A: climate uncertainty (IQR)												
	Income		Institutions		Adaptation		Mitigation		Latitude		Longitude	
	Higher	Lower	Better	Worse	More	Less	More	Less	North	South	West	East
Real GDP	-0.067 (0.135)	-0.244 (0.178)	-0.227 (0.180)	-0.222 (0.170)	-0.168 (0.120)	-0.221 (0.176)	-0.242 (0.443)	-0.254 (0.496)	-0.245 (0.125)	-0.195 (0.248)	-0.188 (0.180)	-0.289* (0.168)
Consumption	-0.131 (0.251)	-0.230 (0.162)	-0.213 (0.190)	-0.264 (0.213)	-0.232 (0.185)	-0.230 (0.151)	-0.236 (0.568)	-0.198 (0.500)	-0.235 (0.148)	-0.196 (0.223)	-0.201 (0.227)	-0.252* (0.138)
Investment	-0.629 (0.653)	0.025 (0.229)	0.115 (0.247)	-0.946 (0.620)	-0.185 (0.305)	-0.125 (0.313)	0.201 (0.735)	0.271 (0.740)	-0.153 (0.269)	0.143 (0.281)	0.090 (0.304)	-0.248 (0.374)
Output per worker	-0.189 (0.139)	-0.452 (0.112)	-0.409 (0.110)	-0.514 (0.139)	-0.321 (0.079)	-0.482 (0.110)	-0.285 (0.287)	-0.181 (0.329)	-0.423 (0.087)	-0.429 (0.158)	-0.343 (0.114)	-0.567 (0.117)
Output per hour	-0.148 (0.207)	-0.383 (0.074)	-0.333 (0.092)	-0.504 (0.168)	-0.293 (0.088)	-0.396 (0.106)	0.041 (0.220)	0.088 (0.224)	-0.378 (0.098)	-0.308 (0.113)	-0.291 (0.095)	-0.486 (0.113)
Real product wage	-0.299 (0.231)	-0.344 (0.090)	-0.253 (0.089)	-0.953 (0.342)	-0.270 (0.100)	-0.473 (0.138)	-0.175 (0.239)	-0.184 (0.217)	-0.366 (0.098)	-0.289 (0.112)	-0.237 (0.066)	-0.545 (0.184)
Real consumption wage	-0.237 (0.070)	-0.211 (0.132)	-0.134 (0.121)	-0.831 (0.381)	-0.272 (0.113)	-0.335* (0.180)	-0.209 (0.245)	-0.314 (0.273)	-0.229* (0.118)	-0.187 (0.161)	-0.154* (0.081)	-0.329 (0.260)
Panel B: climate risk (Median)												
	Income		Institutions		Adaptation		Mitigation		Latitude		Longitude	
	Higher	Lower	Better	Worse	More	Less	More	Less	North	South	West	East
Real GDP	-0.106 (0.130)	-0.227* (0.127)	-0.213* (0.124)	-0.231 (0.172)	-0.180* (0.099)	-0.223* (0.132)	-0.506 (0.310)	-0.534 (0.327)	-0.238 (0.097)	-0.179 (0.174)	-0.169 (0.127)	-0.286 (0.129)
Consumption	-0.191 (0.177)	-0.236 (0.119)	-0.212 (0.135)	-0.348* (0.202)	-0.257* (0.140)	-0.245* (0.126)	-0.609 (0.378)	-0.606* (0.341)	-0.268 (0.112)	-0.173 (0.161)	-0.205 (0.158)	-0.272 (0.121)
Investment	-0.432 (0.564)	-0.116 (0.169)	0.007 (0.187)	-1.078 (0.545)	-0.243 (0.229)	-0.241 (0.259)	-0.364 (0.644)	-0.227 (0.626)	-0.280 (0.196)	0.066 (0.207)	0.018 (0.233)	-0.395 (0.311)
Output per worker	-0.167 (0.132)	-0.376 (0.081)	-0.343 (0.079)	-0.427 (0.127)	-0.264 (0.073)	-0.425 (0.084)	-0.438 (0.200)	-0.353* (0.203)	-0.345 (0.074)	-0.372 (0.108)	-0.273 (0.085)	-0.488 (0.087)
Output per hour	-0.123 (0.169)	-0.327 (0.058)	-0.277 (0.072)	-0.489 (0.123)	-0.229 (0.080)	-0.374 (0.080)	-0.143 (0.215)	-0.079 (0.203)	-0.302 (0.078)	-0.305 (0.083)	-0.228 (0.078)	-0.444 (0.079)
Real product wage	-0.069 (0.196)	-0.267 (0.077)	-0.176 (0.071)	-0.766 (0.236)	-0.217 (0.069)	-0.320 (0.124)	-0.093 (0.179)	-0.114 (0.162)	-0.257 (0.071)	-0.226 (0.102)	-0.188 (0.051)	-0.356 (0.154)
Real consumption wage	-0.202 (0.059)	-0.138 (0.105)	-0.074 (0.092)	-0.739 (0.299)	-0.218 (0.082)	-0.190 (0.158)	-0.076 (0.194)	-0.082 (0.185)	-0.172* (0.088)	-0.096 (0.137)	-0.132 (0.064)	-0.167 (0.208)
Panel C: relative climate risk (Median/IQR)												
	Income		Institutions		Adaptation		Mitigation		Latitude		Longitude	
	Higher	Lower	Better	Worse	More	Less	More	Less	North	South	West	East
Real GDP	-0.108 (0.154)	-0.221* (0.134)	-0.215 (0.135)	-0.184 (0.181)	-0.174 (0.115)	-0.210 (0.143)	-0.684* (0.385)	-0.739* (0.393)	-0.228 (0.113)	-0.181 (0.174)	-0.171 (0.135)	-0.277* (0.142)
Consumption	-0.197 (0.176)	-0.245 (0.120)	-0.229 (0.139)	-0.300 (0.195)	-0.268* (0.148)	-0.268 (0.127)	-0.879* (0.462)	-0.895 (0.421)	-0.271 (0.119)	-0.188 (0.161)	-0.209 (0.156)	-0.292 (0.127)
Investment	-0.297 (0.645)	-0.095 (0.181)	0.058 (0.199)	-1.062* (0.558)	-0.194 (0.260)	-0.251 (0.293)	-0.396 (0.844)	-0.303 (0.810)	-0.243 (0.209)	0.096 (0.207)	0.074 (0.244)	-0.427 (0.356)
Output per worker	-0.169 (0.151)	-0.388 (0.095)	-0.367 (0.093)	-0.364 (0.143)	-0.269 (0.091)	-0.449 (0.110)	-0.598 (0.243)	-0.511 (0.230)	-0.348 (0.091)	-0.398 (0.115)	-0.280 (0.097)	-0.522 (0.111)
Output per hour	-0.141 (0.173)	-0.358 (0.066)	-0.309 (0.078)	-0.494 (0.134)	-0.256 (0.090)	-0.434 (0.090)	-0.252 (0.279)	-0.193 (0.257)	-0.322 (0.082)	-0.356 (0.089)	-0.246 (0.081)	-0.523 (0.087)
Real product wage	-0.055 (0.198)	-0.288 (0.079)	-0.186 (0.072)	-0.772 (0.198)	-0.228 (0.074)	-0.380 (0.130)	-0.126 (0.216)	-0.157 (0.199)	-0.265 (0.070)	-0.260 (0.109)	-0.190 (0.054)	-0.421 (0.162)
Real consumption wage	-0.206 (0.068)	-0.127 (0.102)	-0.059 (0.089)	-0.700 (0.267)	-0.226 (0.088)	-0.203 (0.168)	-0.079 (0.243)	-0.092 (0.234)	-0.156* (0.087)	-0.094 (0.142)	-0.122* (0.068)	-0.161 (0.217)

Each pair of columns reports the impact of a typical annual change in the conditional moment of the climate indicator on the two halves of the country partition, from the asymmetric dynamic panel with Autometrics-selected country fixed effects, macro-financial controls and Driscoll–Kraay standard errors (GTS-FS estimator); standard errors in parentheses. Bold figures denote significance at the 10% level or better; an asterisk marks significance at 10% but not 5%. Countries are split at the annual cross-country mean of the Notre Dame Global Adaptation Index (Adaptation), of the CCPI-mm mitigation index (Mitigation), of real per capita GDP (Income), and by EU membership (Institutions) and geographical position (Latitude, Longitude). † For minimum-temperature extremes the climate-relevant movement is a decrease in cold extremes: the median-based panels are reported with reversed sign. Full results for all dependent variables, hazards and partitions are in Online Appendix Tables A6-A to A6-C.

Table A6-FS: The anatomy of the composite: which hazards act through uncertainty and which through risk (GTS-FS)

	Climate uncertainty (IQR)					Climate risk (Median)				
	Real GDP	Consumption	Investment	Output per worker	Real product wage	Real GDP	Consumption	Investment	Output per worker	Real product wage
E3CI	-0.226 (0.101)	-0.220 (0.109)	-0.040 (0.190)	-0.425 (0.060)	-0.339 (0.076)	-0.215 (0.077)	-0.231 (0.074)	-0.147 (0.148)	-0.355 (0.050)	-0.246 (0.059)
MaxT	-0.123 (0.052)	-0.158 (0.043)	-0.153 (0.105)	-0.215 (0.041)	-0.157 (0.047)	-0.124 (0.046)	-0.143 (0.042)	-0.128 (0.099)	-0.213 (0.033)	-0.154 (0.041)
MinT †	0.324 (0.237)	0.267 (0.250)	0.274 (0.627)	0.541 (0.236)	0.279 (0.206)	-0.393* (0.233)	-0.398* (0.224)	-0.290 (0.388)	-0.569 (0.190)	-0.357 (0.134)
Drought	-0.439 (0.468)	-0.207 (0.554)	0.537 (0.769)	-0.810 (0.384)	-0.664 (0.214)	-0.527 (0.347)	-0.458 (0.397)	0.038 (0.355)	-0.732 (0.288)	-0.603 (0.203)
Prec	-0.350 (0.173)	-0.384 (0.151)	-0.317 (0.244)	-0.504 (0.140)	-0.267 (0.100)	-0.288 (0.251)	-0.334 (0.256)	-0.307 (0.432)	-0.466 (0.224)	-0.124 (0.131)
Wind	-0.779* (0.437)	-0.795 (0.376)	-0.544 (0.415)	-0.847 (0.310)	-0.433 (0.156)	-0.430 (0.182)	-0.420 (0.189)	-0.027 (0.204)	-0.599 (0.128)	-0.384 (0.115)
Fire	-0.275 (0.125)	-0.233 (0.145)	-0.195 (0.291)	-0.496 (0.080)	-0.352 (0.113)	-0.157 (0.076)	-0.134* (0.081)	-0.144 (0.170)	-0.288 (0.053)	-0.177 (0.080)
Hail	-0.732 (0.355)	-0.541 (0.409)	-0.025 (0.493)	-0.984 (0.234)	-0.554 (0.204)	0.415 (0.207)	0.572 (0.199)	0.506 (0.336)	0.616 (0.170)	0.549 (0.114)

The table reports, for the E3CI composite and each of its seven hazard components, the impact of a typical annual change in the conditional interquartile range (climate uncertainty) and in the conditional median (climate risk) on the annual growth rate of each variable, estimated by Autometrics general-to-specific selection (GTS-FS) with country fixed effects, macro-financial controls and Driscoll–Kraay standard errors; standard errors in parentheses. Bold figures denote significance at the 10% level or better; an asterisk marks significance at 10% but not 5%. † For minimum-temperature extremes the climate-relevant movement is a decrease in cold extremes: the climate risk columns are reported with reversed sign.

Table A7-FS: Asymmetric incidence of climate uncertainty and climate risk, all outcomes and hazards (GTS-FS)

Climate uncertainty (IQR)								Climate risk (Median)					
Real GDP	Income		Institutions		Longitude			Income		Institutions		Longitude	
	Higher	Lower	Better	Worse	West	East		Higher	Lower	Better	Worse	West	East
E3CI	-0.067 (0.135)	-0.244 (0.178)	-0.227 (0.180)	-0.222 (0.170)	-0.188 (0.180)	-0.289* (0.168)		-0.106 (0.130)	-0.227* (0.127)	-0.213* (0.124)	-0.231 (0.172)	-0.169 (0.127)	-0.286 (0.129)
MaxT	-0.057 (0.114)	-0.131* (0.077)	-0.126 (0.078)	-0.104 (0.142)	-0.092 (0.080)	-0.182 (0.088)		-0.058 (0.092)	-0.131* (0.076)	-0.122 (0.075)	-0.139 (0.121)	-0.092 (0.078)	-0.178 (0.080)
MinT †	0.363 (0.297)	0.320 (0.335)	0.385 (0.333)	0.048 (0.422)	0.336 (0.327)	0.298 (0.415)		-0.377 (0.269)	-0.395 (0.276)	-0.433* (0.258)	-0.136 (0.401)	-0.359 (0.249)	-0.473 (0.381)
Drought	-0.120 (0.481)	-0.473 (0.517)	-0.404 (0.535)	-0.643 (0.578)	-0.452 (0.531)	-0.420 (0.547)		0.047 (0.427)	-0.590 (0.363)	-0.453 (0.381)	-0.889* (0.476)	-0.422 (0.356)	-0.657 (0.412)
Prec	-0.324 (0.235)	-0.353* (0.210)	-0.364* (0.188)	-0.248 (0.395)	-0.305 (0.196)	-0.427* (0.258)		-0.360 (0.457)	-0.281 (0.310)	-0.303 (0.322)	-0.191 (0.564)	-0.243 (0.323)	-0.367 (0.371)
Wind	-0.547 (0.405)	-0.804* (0.418)	-0.766 (0.386)	-0.847 (0.634)	-0.693* (0.392)	-0.894* (0.474)		-0.223 (0.186)	-0.453 (0.231)	-0.407* (0.219)	-0.555 (0.257)	-0.359* (0.207)	-0.534 (0.242)
Fire	-0.151 (0.185)	-0.289 (0.227)	-0.257 (0.228)	-0.403* (0.238)	-0.205 (0.241)	-0.370* (0.203)		-0.101 (0.136)	-0.164 (0.137)	-0.151 (0.139)	-0.205 (0.163)	-0.114 (0.147)	-0.215* (0.122)
Hail	-0.516 (0.262)	-0.756* (0.433)	-0.731* (0.409)	-0.742 (0.559)	-0.702* (0.417)	-0.776* (0.454)		-0.120 (0.302)	0.471 (0.201)	0.368* (0.202)	0.614* (0.370)	0.304 (0.203)	0.559 (0.255)
Consumption	Income		Institutions		Longitude			Income		Institutions		Longitude	
	Higher	Lower	Better	Worse	West	East		Higher	Lower	Better	Worse	West	East
E3CI	-0.131 (0.251)	-0.230 (0.162)	-0.213 (0.190)	-0.264 (0.213)	-0.201 (0.227)	-0.252* (0.138)		-0.191 (0.177)	-0.236 (0.119)	-0.212 (0.135)	-0.348* (0.202)	-0.205 (0.158)	-0.272 (0.121)
MaxT	-0.061 (0.105)	-0.169 (0.073)	-0.150* (0.079)	-0.216 (0.159)	-0.120 (0.085)	-0.231 (0.090)		-0.074 (0.104)	-0.151 (0.071)	-0.130* (0.078)	-0.235* (0.137)	-0.113 (0.090)	-0.195 (0.079)
MinT †	0.178 (0.367)	0.276 (0.322)	0.334 (0.329)	-0.038 (0.514)	0.294 (0.339)	0.211 (0.435)		-0.383 (0.303)	-0.400 (0.255)	-0.433* (0.255)	-0.167 (0.465)	-0.394 (0.263)	-0.409 (0.369)
Drought	-0.210 (0.691)	-0.207 (0.530)	-0.207 (0.592)	-0.209 (0.776)	-0.255 (0.636)	-0.137 (0.561)		-0.574 (0.506)	-0.446 (0.382)	-0.358 (0.447)	-0.966 (0.593)	-0.430 (0.467)	-0.494 (0.413)
Prec	-0.410* (0.245)	-0.382 (0.193)	-0.380* (0.195)	-0.418 (0.430)	-0.375* (0.214)	-0.400 (0.252)		-0.253 (0.414)	-0.343 (0.333)	-0.328 (0.361)	-0.373 (0.653)	-0.308 (0.350)	-0.377 (0.426)
Wind	-1.186 (0.507)	-0.752 (0.374)	-0.730* (0.380)	-1.134 (0.738)	-0.829* (0.429)	-0.748* (0.430)		-0.621 (0.294)	-0.398* (0.217)	-0.370 (0.247)	-0.679* (0.360)	-0.422 (0.285)	-0.416* (0.214)
Fire	-0.120 (0.335)	-0.246 (0.218)	-0.195 (0.246)	-0.500 (0.330)	-0.192 (0.305)	-0.289 (0.202)		-0.060 (0.203)	-0.142 (0.136)	-0.113 (0.151)	-0.298 (0.215)	-0.109 (0.183)	-0.168 (0.131)
Hail	-0.848 (0.624)	-0.508 (0.434)	-0.532 (0.470)	-0.602 (0.714)	-0.632 (0.563)	-0.413 (0.430)		0.312 (0.225)	0.600 (0.196)	0.479 (0.217)	0.966 (0.471)	0.448 (0.219)	0.735 (0.264)
Investment	Income		Institutions		Longitude			Income		Institutions		Longitude	
	Higher	Lower	Better	Worse	West	East		Higher	Lower	Better	Worse	West	East
E3CI	-0.629 (0.653)	0.025 (0.229)	0.115 (0.247)	-0.946 (0.620)	0.090 (0.304)	-0.248 (0.374)		-0.432 (0.564)	-0.116 (0.169)	0.007 (0.187)	-1.078 (0.545)	0.018 (0.233)	-0.395 (0.311)
MaxT	-0.032 (0.407)	-0.166 (0.122)	-0.037 (0.128)	-0.998 (0.399)	0.005 (0.157)	-0.439* (0.247)		-0.191 (0.353)	-0.121 (0.112)	-0.018 (0.120)	-0.895 (0.345)	-0.002 (0.148)	-0.335 (0.207)
MinT †	2.409* (1.413)	0.060 (0.710)	0.072 (0.659)	1.178 (1.472)	0.305 (0.608)	0.211 (1.230)		-1.593* (0.965)	-0.154 (0.484)	-0.105 (0.461)	-1.471 (1.310)	-0.203 (0.455)	-0.485 (0.967)
Drought	-3.621 (1.779)	0.979 (0.765)	0.619 (0.731)	0.071 (1.980)	0.088 (0.820)	1.182 (1.312)		-2.378 (0.934)	0.299 (0.444)	0.167 (0.556)	-0.602 (1.222)	-0.217 (0.720)	0.348 (0.781)
Prec	-0.685 (0.751)	-0.277 (0.294)	-0.129 (0.304)	-1.672* (0.943)	-0.092 (0.344)	-0.691 (0.644)		1.006 (1.809)	-0.448 (0.497)	-0.059 (0.460)	-2.011 (2.064)	0.357 (0.555)	-1.414 (1.211)
Wind	-2.113 (1.020)	-0.375 (0.438)	-0.303 (0.438)	-1.810 (1.557)	-0.446 (0.854)	-0.675 (0.854)		-0.613 (1.056)	0.036 (0.229)	0.112 (0.263)	-0.768 (0.796)	0.137 (0.379)	-0.264 (0.456)
Fire	-1.352 (0.658)	-0.068 (0.313)	0.007 (0.346)	-1.591 (0.785)	-0.093 (0.405)	-0.332 (0.426)		-0.745* (0.452)	-0.077 (0.183)	-0.026 (0.214)	-1.062 (0.482)	-0.068 (0.253)	-0.243 (0.245)
Hail	-3.913 (1.227)	0.397 (0.584)	0.111 (0.601)	-0.874 (2.075)	-0.311 (0.714)	0.373 (0.975)		0.550 (0.975)	0.501 (0.393)	0.090 (0.441)	2.275 (0.969)	0.199 (0.548)	0.908 (0.704)
Output per worker	Income		Institutions		Longitude			Income		Institutions		Longitude	
	Higher	Lower	Better	Worse	West	East		Higher	Lower	Better	Worse	West	East
E3CI	-0.189 (0.139)	-0.452 (0.112)	-0.409 (0.110)	-0.514 (0.139)	-0.343 (0.114)	-0.567 (0.117)		-0.167 (0.132)	-0.376 (0.081)	-0.343 (0.079)	-0.427 (0.127)	-0.273 (0.085)	-0.488 (0.087)
MaxT	-0.107 (0.106)	-0.228 (0.057)	-0.211 (0.058)	-0.247 (0.092)	-0.148 (0.060)	-0.356 (0.070)		-0.104 (0.088)	-0.226 (0.052)	-0.205 (0.052)	-0.266 (0.084)	-0.153 (0.055)	-0.323 (0.058)
MinT †	0.500* (0.277)	0.545 (0.275)	0.679 (0.258)	-0.101 (0.350)	0.561 (0.254)	0.498 (0.371)		-0.425* (0.248)	-0.585 (0.209)	-0.656 (0.194)	-0.012 (0.279)	-0.535 (0.187)	-0.654 (0.306)
Drought	-0.444 (0.512)	-0.849 (0.424)	-0.798* (0.436)	-0.884* (0.484)	-0.848 (0.405)	-0.755 (0.489)		-0.053 (0.423)	-0.807 (0.317)	-0.637* (0.328)	-1.206 (0.473)	-0.586* (0.302)	-0.910 (0.392)

Prec	-0.349 (0.227)	-0.521 (0.151)	-0.534 (0.134)	-0.294 (0.263)	-0.443 (0.143)	-0.613 (0.195)	-0.376 (0.418)	-0.476* (0.247)	-0.484* (0.262)	-0.348 (0.374)	-0.377 (0.259)	-0.627 (0.289)
Wind	-0.378 (0.353)	-0.898 (0.289)	-0.889 (0.262)	-0.624 (0.487)	-0.794 (0.285)	-0.918 (0.341)	-0.193 (0.196)	-0.643 (0.143)	-0.577 (0.127)	-0.709 (0.223)	-0.509 (0.132)	-0.730 (0.170)
Fire	-0.317* (0.180)	-0.516 (0.151)	-0.454 (0.146)	-0.786 (0.210)	-0.408 (0.155)	-0.618 (0.146)	-0.201 (0.126)	-0.298 (0.096)	-0.260 (0.094)	-0.507 (0.145)	-0.229 (0.100)	-0.370 (0.089)
Hail	-0.565* (0.298)	-1.030 (0.279)	-1.029 (0.240)	-0.695 (0.498)	-1.010 (0.238)	-0.946 (0.357)	-0.007 (0.308)	0.682 (0.181)	0.580 (0.185)	0.766 (0.286)	0.366 (0.173)	0.951 (0.256)
Real product wage	Income		Institutions		Longitude		Income		Institutions		Longitude	
	Higher	Lower	Better	Worse	West	East	Higher	Lower	Better	Worse	West	East
E3CI	-0.299 (0.231)	-0.344 (0.090)	-0.253 (0.089)	-0.953 (0.342)	-0.237 (0.066)	-0.545 (0.184)	-0.069 (0.196)	-0.267 (0.077)	-0.176 (0.071)	-0.766 (0.236)	-0.188 (0.051)	-0.356 (0.154)
MaxT	0.011 (0.121)	-0.177 (0.055)	-0.112 (0.047)	-0.547 (0.169)	-0.099 (0.034)	-0.298 (0.117)	-0.033 (0.121)	-0.168 (0.051)	-0.109 (0.045)	-0.537 (0.152)	-0.103 (0.032)	-0.264 (0.102)
MinT †	0.558 (0.416)	0.249 (0.227)	0.312 (0.208)	0.079 (0.675)	0.243 (0.163)	0.369 (0.494)	-0.227 (0.320)	-0.372 (0.158)	-0.343 (0.147)	-0.495 (0.458)	-0.286 (0.112)	-0.585 (0.409)
Drought	-1.684 (0.617)	-0.551 (0.265)	-0.575 (0.280)	-1.321 (0.834)	-0.509 (0.244)	-0.927* (0.486)	-0.892* (0.505)	-0.569 (0.242)	-0.401 (0.187)	-1.846* (0.968)	-0.395 (0.195)	-0.889* (0.478)
Prec	0.033 (0.329)	-0.303 (0.126)	-0.231 (0.108)	-0.660 (0.314)	-0.244 (0.090)	-0.317 (0.283)	0.371 (0.517)	-0.179 (0.202)	-0.080 (0.133)	-0.512 (0.917)	-0.233 (0.111)	0.094 (0.448)
Wind	-0.077 (0.529)	-0.474 (0.187)	-0.366 (0.157)	-0.930 (0.629)	-0.449 (0.190)	-0.408 (0.390)	-0.190 (0.293)	-0.406 (0.121)	-0.305 (0.101)	-0.895 (0.401)	-0.363 (0.103)	-0.418* (0.224)
Fire	-0.389 (0.364)	-0.348 (0.143)	-0.247* (0.139)	-1.407 (0.534)	-0.249 (0.098)	-0.527 (0.255)	-0.201 (0.242)	-0.174* (0.101)	-0.094 (0.095)	-1.183 (0.346)	-0.131 (0.066)	-0.252 (0.185)
Hail	-0.938 (0.579)	-0.510 (0.225)	-0.475 (0.232)	-1.240 (0.939)	-0.521 (0.204)	-0.608 (0.460)	0.155 (0.277)	0.594 (0.135)	0.360 (0.115)	1.489 (0.442)	0.285 (0.103)	0.942 (0.271)

Each pair of columns reports the impact of a typical annual change in the conditional moment of the climate indicator on the two halves of the country partition, from the asymmetric dynamic panel with Autometrics-selected country fixed effects, macro-financial controls and Driscoll–Kraay standard errors (GTS-FS estimator); standard errors in parentheses. Bold figures denote significance at the 10% level or better; an asterisk marks significance at 10% but not 5%. Countries are split at the annual cross-country mean of the Notre Dame Global Adaptation Index (Adaptation), of the CCPI-mm mitigation index (Mitigation), of real per capita GDP (Income), and by EU membership (Institutions) and geographical position (Latitude, Longitude). † For minimum-temperature extremes the climate-relevant movement is a decrease in cold extremes: the median-based panels are reported with reversed sign. Full results for all dependent variables, hazards and partitions are in Online Appendix Tables A6-A to A6-C.

Table A4-A: Dynamic panel regressions with country fixed effects and macro-financial controls: climate change risk and uncertainty impact by estimator

Panel A: real GDP growth rate															
	IQR					MED					MED/IQR				
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3CI	-0.282 (0.087)	-0.276 (0.042)	-0.268 (0.086)	-0.254 (0.079)	-0.241 (0.077)	-0.159 (0.052)	-0.156 (0.023)	-0.152 (0.050)	-0.145 (0.045)	-0.136 (0.042)	-0.182 (0.077)	-0.175 (0.029)	-0.164 (0.076)	-0.198 (0.083)	-0.179 (0.082)
MaxT	-0.150 (0.060)	-0.143 (0.021)	-0.137 (0.060)	-0.112 (0.043)	-0.103 (0.043)	-0.087 (0.034)	-0.084 (0.013)	-0.082 (0.033)	-0.084 (0.032)	-0.078 (0.031)	-0.152 (0.101)	-0.144 (0.029)	-0.131 (0.097)	-0.134 (0.098)	-0.115 (0.093)
MinT	-0.121 (0.193)	-0.087 (0.054)	-0.073 (0.190)	-0.355 (0.624)	-0.214 (0.583)	0.288* (0.172)	0.293 (0.064)	0.291* (0.171)	0.475 (0.320)	0.588† (0.363)	0.215 (0.185)	0.229 (0.058)	0.211 (0.187)	0.677† (0.412)	0.645† (0.396)
Drought	-0.096 (0.437)	-0.121 (0.092)	-0.131 (0.421)	-0.419† (0.536)	-0.495† (0.536)	-0.117 (0.299)	-0.155* (0.091)	-0.199 (0.295)	-0.141 (0.384)	-0.242 (0.398)	-0.067 (0.290)	-0.104 (0.090)	-0.150 (0.288)	-0.068 (0.305)	-0.153 (0.316)
Prec	-0.065 (0.029)	-0.062 (0.010)	-0.058 (0.028)	-0.073 (0.034)	-0.065 (0.033)	-0.319 (0.197)	-0.280 (0.046)	-0.264 (0.204)	-0.269* (0.156)	-0.223 (0.165)	-0.322 (0.217)	-0.277 (0.050)	-0.259 (0.223)	-0.351 (0.221)	-0.281 (0.226)
Wind	-0.404 (0.166)	-0.416 (0.078)	-0.424 (0.158)	-0.429 (0.176)	-0.453 (0.177)	-0.174* (0.092)	-0.174 (0.033)	-0.167* (0.086)	-0.129 (0.065)	-0.123 (0.059)	-0.176* (0.094)	-0.177 (0.036)	-0.172* (0.089)	-0.123* (0.066)	-0.120* (0.063)
Fire	-0.120* (0.067)	-0.118 (0.023)	-0.116* (0.065)	-0.157* (0.087)	-0.152* (0.084)	-0.144 (0.070)	-0.142 (0.026)	-0.140 (0.068)	-0.065* (0.035)	-0.062* (0.032)	-0.265 (0.114)	-0.257 (0.049)	-0.252 (0.114)	-0.540 (0.226)	-0.513 (0.223)
Hail	-0.429 (0.194)	-0.448 (0.082)	-0.434 (0.190)	-0.498† (0.239)	-0.526† (0.240)	0.406 (0.177)	0.395 (0.075)	0.367 (0.182)	0.364 (0.130)	0.330 (0.136)	0.381 (0.169)	0.371 (0.076)	0.345 (0.173)	0.277 (0.129)	0.250* (0.127)
Panel B: real consumption growth rate															
	IQR					MED					MED/IQR				
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3CI	-0.347 (0.097)	-0.335 (0.059)	-0.310 (0.085)	-0.312 (0.101)	-0.278 (0.089)	-0.183 (0.061)	-0.177 (0.033)	-0.163 (0.052)	-0.168 (0.051)	-0.146 (0.042)	-0.238 (0.071)	-0.228 (0.047)	-0.206 (0.062)	-0.260 (0.075)	-0.224 (0.067)
MaxT	-0.192 (0.051)	-0.182 (0.034)	-0.163 (0.048)	-0.144 (0.045)	-0.123 (0.040)	-0.107 (0.035)	-0.102 (0.019)	-0.094 (0.031)	-0.103 (0.036)	-0.090 (0.030)	-0.231 (0.080)	-0.219 (0.047)	-0.194 (0.073)	-0.204 (0.078)	-0.171 (0.071)
MinT	-0.309* (0.184)	-0.269 (0.082)	-0.261 (0.179)	-0.908 (0.781)	-0.761 (0.724)	0.242 (0.153)	0.247 (0.083)	0.209 (0.157)	0.397 (0.280)	0.570† (0.367)	0.077 (0.156)	0.092 (0.078)	0.070 (0.156)	0.652† (0.455)	0.592† (0.416)
Drought	0.159 (0.511)	0.148 (0.103)	0.148 (0.489)	-0.216† (0.644)	-0.235† (0.633)	-0.048 (0.364)	-0.078 (0.102)	-0.103 (0.357)	-0.056 (0.436)	-0.123 (0.447)	-0.011 (0.350)	-0.040 (0.102)	-0.070 (0.346)	-0.011 (0.359)	-0.071 (0.365)
Prec	-0.084 (0.029)	-0.080 (0.015)	-0.071 (0.026)	-0.095 (0.040)	-0.080 (0.034)	-0.514 (0.178)	-0.470 (0.084)	-0.419 (0.182)	-0.447 (0.157)	-0.364 (0.152)	-0.542 (0.198)	-0.491 (0.093)	-0.447 (0.201)	-0.589 (0.217)	-0.483 (0.205)
Wind	-0.392* (0.217)	-0.396 (0.093)	-0.399* (0.204)	-0.443 (0.217)	-0.452 (0.207)	-0.172 (0.115)	-0.169 (0.043)	-0.162 (0.105)	-0.127 (0.082)	-0.119 (0.073)	-0.174 (0.116)	-0.172 (0.046)	-0.168 (0.107)	-0.121 (0.082)	-0.116 (0.075)
Fire	-0.115 (0.075)	-0.110 (0.029)	-0.103 (0.068)	-0.151 (0.094)	-0.135 (0.085)	-0.138* (0.081)	-0.134 (0.033)	-0.124* (0.072)	-0.062* (0.035)	-0.054* (0.031)	-0.341 (0.115)	-0.327 (0.061)	-0.305 (0.104)	-0.697 (0.254)	-0.622 (0.227)
Hail	-0.369 (0.244)	-0.381 (0.094)	-0.354 (0.226)	-0.388† (0.293)	-0.393† (0.284)	0.605 (0.148)	0.586 (0.093)	0.559 (0.151)	0.547 (0.131)	0.505 (0.126)	0.586 (0.135)	0.568 (0.094)	0.542 (0.136)	0.424 (0.137)	0.391 (0.130)
Panel C: real investment growth rate															
	IQR					MED					MED/IQR				
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3CI	-0.352 (0.227)	-0.341 (0.102)	-0.258 (0.205)	-0.318 (0.205)	-0.233 (0.186)	-0.216 (0.132)	-0.211 (0.064)	-0.168 (0.119)	-0.198 (0.124)	-0.150 (0.109)	-0.264* (0.160)	-0.254 (0.089)	-0.196 (0.140)	-0.288 (0.180)	-0.213 (0.158)
MaxT	-0.250* (0.132)	-0.240 (0.072)	-0.169 (0.122)	-0.190 (0.094)	-0.129 (0.088)	-0.136* (0.081)	-0.132 (0.040)	-0.101 (0.073)	-0.132* (0.076)	-0.096 (0.067)	-0.311* (0.164)	-0.302 (0.094)	-0.223 (0.143)	-0.275* (0.149)	-0.196 (0.129)
MinT	-0.319 (0.485)	-0.239 (0.210)	-0.333 (0.484)	-0.975 (1.632)	-1.014 (1.620)	0.402 (0.408)	0.419 (0.193)	0.233 (0.427)	0.664 (0.669)	0.432† (0.579)	0.220 (0.478)	0.256 (0.211)	0.090 (0.500)	0.882† (0.804)	0.667† (0.751)
Drought	0.562 (0.869)	0.502* (0.292)	0.569 (0.867)	0.631† (0.901)	0.610† (0.870)	0.402 (0.439)	0.330 (0.237)	0.268 (0.376)	0.468 (0.448)	0.317 (0.398)	0.428 (0.430)	0.362 (0.240)	0.278 (0.373)	0.435 (0.402)	0.284 (0.352)
Prec	-0.100 (0.066)	-0.096 (0.031)	-0.073 (0.059)	-0.110 (0.069)	-0.080 (0.061)	-0.760* (0.439)	-0.690 (0.217)	-0.548 (0.382)	-0.626* (0.355)	-0.455 (0.311)	-0.854* (0.500)	-0.773 (0.236)	-0.620 (0.439)	-0.925* (0.530)	-0.666 (0.454)
Wind	-0.351 (0.366)	-0.381* (0.196)	-0.368 (0.363)	-0.386 (0.360)	-0.405 (0.357)	-0.127 (0.197)	-0.132 (0.098)	-0.100 (0.188)	-0.095 (0.146)	-0.074 (0.138)	-0.108 (0.215)	-0.114 (0.108)	-0.086 (0.208)	-0.075 (0.147)	-0.061 (0.142)
Fire	-0.190 (0.148)	-0.188 (0.060)	-0.156 (0.141)	-0.250 (0.204)	-0.204 (0.193)	-0.198 (0.154)	-0.198 (0.066)	-0.156 (0.145)	-0.090 (0.079)	-0.070 (0.072)	-0.396 (0.130)	-0.384 (0.239)	-0.316 (0.239)	-0.813 (0.584)	-0.647 (0.532)
Hail	-0.161 (0.313)	-0.217 (0.209)	-0.070 (0.292)	-0.055† (0.376)	-0.018† (0.358)	0.736 (0.348)	0.710 (0.179)	0.653 (0.316)	0.676 (0.343)	0.599 (0.304)	0.729* (0.384)	0.705 (0.186)	0.652* (0.345)	0.530* (0.320)	0.473* (0.284)
Panel D: employed persons (growth rate)															
	IQR					MED					MED/IQR				
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3CI	0.097 (0.063)	0.090 (0.031)	0.077 (0.057)	0.089 (0.059)	0.069 (0.054)	0.048 (0.040)	0.043 (0.016)	0.036 (0.037)	0.043 (0.037)	0.031 (0.033)	0.071 (0.047)	0.065 (0.022)	0.056 (0.043)	0.077 (0.052)	0.061 (0.048)

MaxT	0.040 (0.037)	0.035* (0.019)	0.023 (0.032)	0.030 (0.029)	0.018 (0.025)	0.028 (0.024)	0.025 (0.010)	0.020 (0.021)	0.028 (0.023)	0.019 (0.021)	0.072 (0.048)	0.067 (0.022)	0.054 (0.043)	0.063 (0.042)	0.047 (0.038)
MinT	-0.039 (0.103)	-0.023 (0.039)	-0.003 (0.093)	-0.125 (0.320)	-0.010 (0.291)	-0.065 (0.088)	-0.054 (0.050)	-0.020 (0.079)	-0.114 (0.161)	-0.037 (0.145)	-0.061 (0.093)	-0.046 (0.044)	-0.015 (0.084)	-0.199† (0.208)	-0.128† (0.196)
Drought	0.406* (0.233)	0.395 (0.081)	0.380 (0.240)	0.475† (0.048)	0.432*† (0.252)	0.234 (0.144)	0.215 (0.054)	0.227 (0.148)	0.261* (0.134)	0.253* (0.132)	0.213 (0.137)	0.195 (0.053)	0.210 (0.140)	0.213* (0.114)	0.211* (0.112)
Prec	0.025 (0.019)	0.023 (0.008)	0.019 (0.017)	0.027 (0.022)	0.021 (0.019)	0.040 (0.112)	0.038 (0.044)	0.020 (0.101)	0.034 (0.094)	0.016 (0.085)	0.032 (0.124)	0.033 (0.046)	0.013 (0.112)	0.034 (0.135)	0.015 (0.121)
Wind	0.124 (0.143)	0.108 (0.048)	0.104 (0.137)	0.138 (0.185)	0.117 (0.173)	0.056 (0.066)	0.049 (0.022)	0.042 (0.061)	0.041 (0.050)	0.031 (0.046)	0.061 (0.070)	0.055 (0.024)	0.049 (0.065)	0.043 (0.052)	0.035 (0.048)
Fire	0.057 (0.047)	0.052 (0.015)	0.046 (0.045)	0.075 (0.064)	0.060 (0.060)	0.063 (0.049)	0.057 (0.017)	0.050 (0.047)	0.028 (0.024)	0.022 (0.021)	0.104 (0.086)	0.094 (0.037)	0.082 (0.079)	0.214 (0.168)	0.169 (0.156)
Hail	0.151 (0.134)	0.128 (0.047)	0.098 (0.126)	0.189† (0.154)	0.141† (0.152)	-0.060 (0.072)	-0.055 (0.045)	-0.049 (0.068)	-0.056 (0.068)	-0.046 (0.064)	-0.072 (0.077)	-0.068 (0.049)	-0.063 (0.074)	-0.053 (0.054)	-0.046 (0.051)

Panel E: hours worked per employed person (growth rate)

	IQR					MED					MED/IQR				
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3Ci	-0.006 (0.080)	-0.008 (0.018)	-0.007 (0.075)	-0.005 (0.072)	-0.006 (0.067)	0.006 (0.054)	0.005 (0.011)	0.005 (0.050)	0.006 (0.051)	0.004 (0.045)	0.015 (0.065)	0.014 (0.015)	0.013 (0.061)	0.016 (0.071)	0.014 (0.067)
MaxT	0.010 (0.047)	0.010 (0.012)	0.009 (0.044)	0.008 (0.035)	0.007 (0.033)	0.005 (0.031)	0.004 (0.007)	0.004 (0.029)	0.005 (0.032)	0.004 (0.029)	-0.008 (0.069)	-0.008 (0.016)	-0.008 (0.063)	-0.007 (0.062)	-0.007 (0.057)
MinT	0.038 (0.070)	0.042 (0.039)	0.041 (0.068)	0.108 (0.205)	0.115 (0.201)	0.033 (0.078)	0.037 (0.028)	0.037 (0.074)	0.053 (0.131)	0.060 (0.125)	0.003 (0.086)	0.009 (0.032)	0.007 (0.082)	0.110† (0.248)	0.114† (0.234)
Drought	0.024 (0.251)	0.012 (0.057)	0.015 (0.245)	-0.194† (0.289)	-0.205† (0.280)	-0.076 (0.167)	-0.087* (0.051)	-0.082 (0.162)	-0.088 (0.204)	-0.096 (0.201)	-0.067 (0.158)	-0.077 (0.051)	-0.072 (0.153)	-0.069 (0.171)	-0.075 (0.168)
Prec	0.007 (0.026)	0.006 (0.006)	0.006 (0.024)	0.007 (0.027)	0.007 (0.026)	0.086 (0.096)	0.092 (0.035)	0.085 (0.096)	0.074 (0.078)	0.071 (0.077)	0.075 (0.100)	0.082 (0.038)	0.076 (0.100)	0.083 (0.110)	0.082 (0.109)
Wind	-0.069 (0.156)	-0.077 (0.034)	-0.074 (0.150)	-0.084 (0.190)	-0.086 (0.176)	-0.016 (0.086)	-0.018 (0.017)	-0.017 (0.081)	-0.013 (0.070)	-0.014 (0.063)	-0.002 (0.087)	-0.005 (0.017)	-0.004 (0.084)	-0.002 (0.065)	-0.003 (0.062)
Fire	0.032 (0.056)	0.030 (0.012)	0.029 (0.054)	0.042 (0.080)	0.038 (0.075)	0.026 (0.064)	0.024* (0.013)	0.023 (0.061)	0.012 (0.032)	0.010 (0.029)	0.011 (0.097)	0.010 (0.023)	0.010 (0.092)	0.023 (0.198)	0.019 (0.187)
Hail	-0.134 (0.179)	-0.142 (0.038)	-0.137 (0.167)	-0.176† (0.193)	-0.181† (0.181)	0.072 (0.059)	0.074 (0.027)	0.070 (0.057)	0.073 (0.058)	0.068 (0.054)	0.052 (0.051)	0.054* (0.028)	0.051 (0.052)	0.037 (0.040)	0.036 (0.040)

Panel F: labor productivity – output per worker (growth rate)

	IQR					MED					MED/IQR				
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3Ci	-0.456 (0.061)	-0.445 (0.045)	-0.448 (0.060)	-0.411 (0.067)	-0.403 (0.067)	-0.254 (0.033)	-0.247 (0.025)	-0.248 (0.032)	-0.226 (0.029)	-0.220 (0.028)	-0.315 (0.059)	-0.304 (0.031)	-0.308 (0.058)	-0.340 (0.066)	-0.333 (0.065)
MaxT	-0.253 (0.047)	-0.242 (0.023)	-0.245 (0.044)	-0.185 (0.037)	-0.180 (0.023)	-0.148 (0.023)	-0.143 (0.014)	-0.144 (0.022)	-0.143 (0.023)	-0.139 (0.022)	-0.289 (0.090)	-0.277 (0.028)	-0.281 (0.087)	-0.256 (0.101)	-0.248 (0.098)
MinT	-0.078 (0.243)	-0.056 (0.065)	-0.065 (0.241)	-0.213 (0.713)	-0.177 (0.696)	0.394 (0.195)	0.392 (0.056)	0.390 (0.192)	0.659* (0.349)	0.658* (0.350)	0.317 (0.224)	0.320 (0.059)	0.316 (0.220)	0.960† (0.362)	0.946† (0.360)
Drought	-0.502 (0.324)	-0.519 (0.104)	-0.510 (0.319)	-0.905† (0.456)	-0.921† (0.460)	-0.362 (0.280)	-0.385 (0.096)	-0.380 (0.279)	-0.443 (0.406)	-0.474 (0.415)	-0.288 (0.285)	-0.310 (0.093)	-0.307 (0.283)	-0.301 (0.334)	-0.322 (0.335)
Prec	-0.117 (0.020)	-0.112 (0.011)	-0.113 (0.019)	-0.131 (0.032)	-0.127 (0.031)	-0.513 (0.168)	-0.469 (0.056)	-0.487 (0.167)	-0.464 (0.132)	-0.444 (0.133)	-0.495 (0.204)	-0.449 (0.059)	-0.469 (0.202)	-0.561 (0.201)	-0.530 (0.198)
Wind	-0.570 (0.109)	-0.571 (0.077)	-0.571 (0.110)	-0.655 (0.215)	-0.656 (0.219)	-0.265 (0.067)	-0.261 (0.034)	-0.262 (0.066)	-0.195 (0.048)	-0.194 (0.047)	-0.270 (0.071)	-0.266 (0.036)	-0.268 (0.070)	-0.187 (0.061)	-0.186 (0.061)
Fire	-0.217 (0.047)	-0.211 (0.026)	-0.212 (0.044)	-0.281 (0.071)	-0.275 (0.068)	-0.250 (0.050)	-0.244 (0.029)	-0.245 (0.047)	-0.110 (0.034)	-0.108 (0.032)	-0.463 (0.107)	-0.448 (0.052)	-0.452 (0.109)	-0.938 (0.178)	-0.914 (0.180)
Hail	-0.631 (0.134)	-0.633 (0.073)	-0.631 (0.132)	-0.707† (0.151)	-0.712† (0.153)	0.534 (0.151)	0.519 (0.075)	0.522 (0.151)	0.496 (0.104)	0.487 (0.103)	0.513 (0.146)	0.499 (0.076)	0.502 (0.147)	0.378 (0.109)	0.370 (0.108)

Panel G: labor productivity – output per hour worked (growth rate)

	IQR					MED					MED/IQR				
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3Ci	-0.398 (0.071)	-0.383 (0.044)	-0.394 (0.065)	-0.358 (0.083)	-0.356 (0.080)	-0.230 (0.041)	-0.220 (0.027)	-0.227 (0.038)	-0.208 (0.048)	-0.203 (0.045)	-0.308 (0.060)	-0.295 (0.035)	-0.304 (0.055)	-0.327 (0.079)	-0.323 (0.075)
MaxT	-0.254 (0.045)	-0.242 (0.028)	-0.250 (0.041)	-0.191 (0.033)	-0.188 (0.033)	-0.139 (0.026)	-0.133 (0.016)	-0.137 (0.024)	-0.139 (0.024)	-0.136 (0.022)	-0.270 (0.080)	-0.257 (0.032)	-0.268 (0.077)	-0.241 (0.089)	-0.239 (0.086)
MinT	-0.097 (0.225)	-0.078 (0.077)	-0.094 (0.228)	-0.266 (0.673)	-0.259 (0.680)	0.323* (0.176)	0.314 (0.057)	0.313* (0.171)	0.538 (0.331)	0.529 (0.324)	0.249 (0.202)	0.243 (0.068)	0.241 (0.196)	0.628† (0.255)	0.610† (0.253)
Drought	-0.266 (0.174)	-0.275 (0.095)	-0.283 (0.175)	-0.334† (0.290)	-0.363† (0.298)	-0.109 (0.219)	-0.125 (0.103)	-0.133 (0.219)	-0.128 (0.274)	-0.158 (0.281)	-0.067 (0.224)	-0.084 (0.098)	-0.092 (0.223)	-0.069 (0.238)	-0.095 (0.243)
Prec	-0.112 (0.022)	-0.107 (0.013)	-0.110 (0.020)	-0.123 (0.024)	-0.121 (0.024)	-0.600 (0.147)	-0.560 (0.073)	-0.588 (0.152)	-0.520 (0.100)	-0.512 (0.107)	-0.580 (0.187)	-0.538 (0.075)	-0.569 (0.193)	-0.658 (0.192)	-0.641 (0.195)

Wind	-0.338 (0.108)	-0.332 (0.074)	-0.341 (0.106)	-0.442 (0.191)	-0.433 (0.184)	-0.193 (0.070)	-0.186 (0.033)	-0.190 (0.067)	-0.154 (0.065)	-0.150 (0.060)	-0.209 (0.071)	-0.203 (0.035)	-0.207 (0.069)	-0.152 (0.058)	-0.150 (0.057)
Fire	-0.208 (0.039)	-0.200 (0.027)	-0.208 (0.036)	-0.273 (0.086)	-0.272 (0.082)	-0.233 (0.048)	-0.225 (0.030)	-0.233 (0.044)	-0.104 (0.042)	-0.105 (0.039)	-0.421 (0.105)	-0.404 (0.048)	-0.420 (0.100)	-0.854 (0.187)	-0.850 (0.180)
Hail	-0.368 (0.145)	-0.363 (0.076)	-0.367 (0.139)	-0.329† (0.146)	-0.334† (0.144)	0.387 (0.106)	0.369 (0.062)	0.381 (0.103)	0.391 (0.100)	0.374 (0.089)	0.397 (0.110)	0.381 (0.062)	0.392 (0.108)	0.292 (0.081)	0.288 (0.077)

Panel H: real product wage (growth rate)

	IQR					MED					MED/IQR				
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3CI	-0.363 (0.085)	-0.347 (0.058)	-0.341 (0.075)	-0.333 (0.107)	-0.312 (0.095)	-0.181 (0.052)	-0.172 (0.031)	-0.175 (0.051)	-0.171 (0.046)	-0.163 (0.044)	-0.255 (0.060)	-0.243 (0.044)	-0.248 (0.057)	-0.281 (0.070)	-0.272 (0.067)
MaxT	-0.169 (0.064)	-0.157 (0.034)	-0.164 (0.063)	-0.129 (0.034)	-0.125 (0.059)	-0.104 (0.031)	-0.098 (0.017)	-0.100 (0.031)	-0.103 (0.035)	-0.098 (0.034)	-0.244 (0.061)	-0.232 (0.038)	-0.238 (0.056)	-0.218 (0.062)	-0.213 (0.059)
MinT	-0.155 (0.156)	-0.139 (0.090)	-0.160 (0.138)	-0.469 (0.566)	-0.480 (0.527)	0.231 (0.144)	0.217 (0.095)	0.198 (0.140)	0.386 (0.298)	0.335 (0.279)	0.154 (0.156)	0.147* (0.088)	0.100 (0.154)	0.671† (0.333)	0.577*† (0.321)
Drought	-0.464* (0.259)	-0.468 (0.224)	-0.457* (0.268)	-0.763† (0.206)	-0.762† (0.217)	-0.367 (0.232)	-0.382 (0.155)	-0.451* (0.232)	-0.451* (0.242)	-0.527 (0.235)	-0.308 (0.227)	-0.324 (0.151)	-0.364 (0.223)	-0.327 (0.205)	-0.387 (0.188)
Prec	-0.086 (0.022)	-0.081 (0.014)	-0.083 (0.032)	-0.096 (0.032)	-0.093 (0.033)	-0.353 (0.131)	-0.315 (0.101)	-0.259 (0.120)	-0.313 (0.140)	-0.227* (0.125)	-0.365 (0.135)	-0.326 (0.105)	-0.269 (0.125)	-0.405 (0.166)	-0.296 (0.148)
Wind	-0.393 (0.132)	-0.389 (0.094)	-0.385 (0.132)	-0.475 (0.224)	-0.455 (0.222)	-0.171 (0.068)	-0.166 (0.039)	-0.153 (0.068)	-0.145 (0.061)	-0.121 (0.054)	-0.169 (0.069)	-0.164 (0.041)	-0.154 (0.070)	-0.119 (0.057)	-0.108 (0.055)
Fire	-0.152 (0.061)	-0.144 (0.030)	-0.130 (0.060)	-0.200 (0.075)	-0.171 (0.075)	-0.175 (0.065)	-0.166 (0.033)	-0.149 (0.064)	-0.079 (0.027)	-0.066 (0.025)	-0.367 (0.090)	-0.348 (0.076)	-0.357 (0.083)	-0.758 (0.226)	-0.734 (0.203)
Hail	-0.381 (0.148)	-0.378 (0.082)	-0.334 (0.146)	-0.431† (0.152)	-0.403† (0.159)	0.471 (0.092)	0.451 (0.106)	0.461 (0.085)	0.483 (0.140)	0.465 (0.128)	0.483 (0.090)	0.463 (0.114)	0.473 (0.085)	0.351 (0.098)	0.342 (0.091)

Panel I: real consumption wage (growth rate)

	IQR					MED					MED/IQR				
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3CI	-0.307 (0.093)	-0.288 (0.066)	-0.244 (0.098)	-0.281 (0.106)	-0.222 (0.102)	-0.153 (0.058)	-0.141 (0.035)	-0.119* (0.063)	-0.144 (0.054)	-0.107* (0.056)	-0.208 (0.069)	-0.193 (0.048)	-0.162 (0.075)	-0.228 (0.081)	-0.177 (0.084)
MaxT	-0.115* (0.065)	-0.100 (0.037)	-0.088 (0.067)	-0.071 (0.056)	-0.055 (0.055)	-0.082 (0.035)	-0.075 (0.020)	-0.060 (0.037)	-0.082 (0.037)	-0.058 (0.037)	-0.184 (0.077)	-0.169 (0.041)	-0.132* (0.076)	-0.165 (0.077)	-0.119 (0.074)
MinT	-0.263* (0.142)	-0.240 (0.090)	-0.261 (0.126)	-0.799 (0.666)	-0.786 (0.626)	0.082 (0.152)	0.063 (0.101)	-0.022 (0.160)	0.138 (0.277)	-0.037 (0.267)	0.012 (0.178)	0.003 (0.091)	-0.094 (0.184)	0.519† (0.353)	0.295† (0.360)
Drought	-0.568 (0.277)	-0.579 (0.173)	-0.549* (0.295)	-0.724† (0.264)	-0.704† (0.295)	-0.378 (0.274)	-0.402 (0.129)	-0.422 (0.279)	-0.466* (0.260)	-0.537 (0.254)	-0.320 (0.261)	-0.345 (0.127)	-0.375 (0.263)	-0.341 (0.217)	-0.398 (0.201)
Prec	-0.072 (0.026)	-0.066 (0.016)	-0.054 (0.027)	-0.080 (0.032)	-0.060* (0.034)	-0.276* (0.142)	-0.228 (0.106)	-0.143 (0.144)	-0.250* (0.142)	-0.125 (0.135)	-0.291 (0.148)	-0.241 (0.112)	-0.153 (0.150)	-0.323* (0.183)	-0.168 (0.173)
Wind	-0.397 (0.169)	-0.393 (0.092)	-0.371 (0.172)	-0.480* (0.255)	-0.437* (0.253)	-0.164* (0.086)	-0.159 (0.043)	-0.138 (0.086)	-0.139* (0.076)	-0.109 (0.068)	-0.166* (0.086)	-0.162 (0.046)	-0.142 (0.087)	-0.117* (0.066)	-0.101 (0.064)
Fire	-0.139* (0.072)	-0.129 (0.033)	-0.112 (0.075)	-0.184* (0.096)	-0.147 (0.100)	-0.153 (0.077)	-0.143 (0.037)	-0.122 (0.081)	-0.069 (0.034)	-0.053 (0.034)	-0.321 (0.091)	-0.298 (0.084)	-0.259 (0.096)	-0.664 (0.225)	-0.532 (0.214)
Hail	-0.268 (0.177)	-0.269 (0.082)	-0.211 (0.181)	-0.319*† (0.189)	-0.281† (0.203)	0.402 (0.114)	0.375 (0.119)	0.345 (0.115)	0.411 (0.129)	0.345 (0.121)	0.416 (0.113)	0.389 (0.124)	0.363 (0.114)	0.301 (0.096)	0.260 (0.091)

Panel L: real wage wedge (growth rate)

	IQR					MED					MED/IQR				
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3CI	0.006 (0.039)	0.008 (0.021)	0.028 (0.036)	0.006 (0.035)	0.026 (0.033)	-0.000 (0.026)	0.000 (0.014)	0.012 (0.024)	-0.000 (0.024)	0.011 (0.022)	0.005 (0.032)	0.006 (0.020)	0.021 (0.030)	0.005 (0.035)	0.023 (0.032)
MaxT	0.014 (0.028)	0.015 (0.018)	0.028 (0.026)	0.011 (0.022)	0.021 (0.021)	0.002 (0.016)	0.003 (0.008)	0.010 (0.015)	0.002 (0.016)	0.010 (0.014)	0.017 (0.033)	0.017 (0.017)	0.034 (0.030)	0.015 (0.029)	0.030 (0.025)
MinT	-0.141 (0.068)	-0.137 (0.066)	-0.133* (0.070)	-0.432 (0.305)	-0.405 (0.293)	-0.089 (0.069)	-0.091 (0.040)	-0.110* (0.066)	-0.150 (0.117)	-0.184* (0.111)	-0.103 (0.075)	-0.104 (0.044)	-0.118 (0.072)	-0.053† (0.116)	-0.095† (0.117)
Drought	-0.059 (0.116)	-0.064 (0.158)	-0.048 (0.118)	0.075† (0.105)	0.091† (0.106)	0.041 (0.076)	0.035 (0.088)	0.039 (0.073)	0.050 (0.098)	0.049 (0.099)	0.043 (0.078)	0.037 (0.084)	0.038 (0.075)	0.045 (0.088)	0.040 (0.085)
Prec	-0.001 (0.013)	-0.001 (0.007)	0.005 (0.012)	-0.001 (0.014)	0.006 (0.013)	-0.038 (0.076)	-0.034 (0.074)	0.001 (0.073)	-0.033 (0.066)	0.001 (0.062)	-0.045 (0.080)	-0.041 (0.077)	-0.005 (0.078)	-0.049 (0.090)	-0.005 (0.084)
Wind	-0.015 (0.066)	-0.016 (0.032)	0.001 (0.062)	-0.018 (0.077)	0.002 (0.072)	-0.005 (0.038)	-0.006 (0.018)	0.005 (0.035)	-0.004 (0.032)	0.004 (0.027)	-0.010 (0.041)	-0.010 (0.020)	0.001 (0.038)	-0.007 (0.028)	0.001 (0.027)
Fire	-0.009 (0.026)	-0.009 (0.011)	0.002 (0.025)	-0.012 (0.035)	0.002 (0.032)	-0.003 (0.029)	-0.002 (0.012)	0.009 (0.027)	-0.001 (0.013)	0.004 (0.012)	-0.004 (0.043)	-0.003 (0.024)	0.018 (0.040)	-0.009 (0.089)	0.038 (0.082)
Hail	0.098 (0.064)	0.095 (0.040)	0.117* (0.059)	0.101† (0.064)	0.117*† (0.064)	-0.001 (0.054)	-0.005 (0.040)	-0.027 (0.052)	-0.001 (0.055)	-0.026 (0.053)	0.004 (0.057)	-0.000 (0.041)	-0.022 (0.055)	0.003 (0.041)	-0.015 (0.040)

Panel M: labor share (change)

IQR						MED						MED/IQR			
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3CI	0.109 (0.109)	0.109 (0.048)	0.145 (0.109)	0.098 (0.096)	0.130 (0.096)	0.085 (0.076)	0.085 (0.027)	0.107 (0.075)	0.083 (0.077)	0.098 (0.073)	0.101 (0.095)	0.100 (0.036)	0.130 (0.095)	0.113 (0.111)	0.145 (0.113)
MaxT	0.118 (0.086)	0.116 (0.033)	0.140* (0.083)	0.089 (0.057)	0.106 (0.053)	0.054 (0.047)	0.053 (0.016)	0.067 (0.046)	0.054 (0.045)	0.065 (0.042)	0.081 (0.090)	0.079 (0.033)	0.111 (0.091)	0.074 (0.085)	0.102 (0.088)
MinT	0.051 (0.174)	0.047 (0.126)	0.036 (0.176)	0.130 (0.488)	0.090 (0.474)	-0.218 (0.302)	-0.222 (0.100)	-0.269 (0.297)	-0.269 (0.345)	-0.332 (0.330)	-0.179 (0.300)	-0.183 (0.092)	-0.226 (0.296)	-0.303† (0.293)	-0.390† (0.294)
Drought	-0.255 (0.339)	-0.246 (0.241)	-0.195 (0.338)	-0.207† (0.371)	-0.143† (0.384)	-0.254 (0.307)	-0.247 (0.202)	-0.225 (0.305)	-0.315 (0.300)	-0.288 (0.318)	-0.242 (0.290)	-0.236 (0.195)	-0.221 (0.291)	-0.249 (0.246)	-0.227 (0.254)
Prec	0.037 (0.037)	0.036 (0.012)	0.047 (0.037)	0.040 (0.039)	0.052 (0.037)	0.281 (0.214)	0.276 (0.124)	0.333 (0.217)	0.256 (0.174)	0.291* (0.168)	0.265 (0.215)	0.258* (0.132)	0.316 (0.221)	0.293 (0.218)	0.347 (0.221)
Wind	0.055 (0.160)	0.057 (0.094)	0.099 (0.156)	0.067 (0.191)	0.118 (0.174)	0.057 (0.085)	0.057 (0.045)	0.085 (0.083)	0.050 (0.076)	0.068 (0.068)	0.064 (0.090)	0.065 (0.048)	0.093 (0.089)	0.045 (0.062)	0.065 (0.063)
Fire	0.064 (0.100)	0.065 (0.022)	0.088 (0.097)	0.084 (0.137)	0.114 (0.133)	0.073 (0.106)	0.074 (0.026)	0.100 (0.103)	0.033 (0.054)	0.044 (0.052)	0.098 (0.151)	0.097* (0.051)	0.139 (0.152)	0.196 (0.296)	0.277 (0.296)
Hail	0.129 (0.158)	0.131 (0.095)	0.194 (0.153)	0.132† (0.168)	0.186† (0.164)	-0.115 (0.123)	-0.114 (0.092)	-0.137 (0.119)	-0.126 (0.121)	-0.146 (0.115)	-0.097 (0.120)	-0.097 (0.098)	-0.116 (0.120)	-0.069 (0.082)	-0.082 (0.081)

Panel N: unemployment rate (change)

IQR						MED						MED/IQR			
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3CI	-0.052 (0.033)	-0.047 (0.033)	-0.059 (0.030)	-0.048 (0.032)	-0.053* (0.030)	-0.020 (0.022)	-0.017 (0.006)	-0.024 (0.020)	-0.019 (0.020)	-0.021 (0.018)	-0.030 (0.027)	-0.026 (0.025)	-0.035 (0.025)	-0.033 (0.030)	-0.038 (0.027)
MaxT	-0.010 (0.024)	-0.007 (0.005)	-0.015 (0.022)	-0.007 (0.019)	-0.012 (0.018)	-0.011 (0.014)	-0.009 (0.003)	-0.013 (0.012)	-0.011 (0.014)	-0.013 (0.012)	-0.035 (0.026)	-0.031 (0.007)	-0.041* (0.023)	-0.031 (0.023)	-0.036* (0.020)
MinT	-0.062 (0.056)	-0.072 (0.030)	-0.063 (0.058)	-0.202 (0.253)	-0.203 (0.253)	-0.020 (0.053)	-0.026 (0.020)	-0.007 (0.054)	-0.034 (0.089)	-0.012 (0.091)	-0.036 (0.057)	-0.044* (0.024)	-0.027 (0.058)	0.106† (0.118)	0.120† (0.112)
Drought	-0.254* (0.139)	-0.244 (0.043)	-0.255* (0.135)	-0.324† (0.121)	-0.327† (0.116)	-0.126 (0.078)	-0.111 (0.023)	-0.119 (0.077)	-0.138 (0.065)	-0.133 (0.068)	-0.115 (0.076)	-0.101 (0.024)	-0.107 (0.076)	-0.113 (0.057)	-0.105* (0.059)
Prec	-0.011 (0.011)	-0.009 (0.003)	-0.013 (0.010)	-0.012 (0.012)	-0.014 (0.011)	-0.007 (0.070)	-0.006 (0.018)	-0.022 (0.066)	-0.006 (0.061)	-0.018 (0.055)	-0.011 (0.073)	-0.013 (0.021)	-0.028 (0.068)	-0.012 (0.080)	-0.030 (0.074)
Wind	-0.080 (0.065)	-0.068 (0.021)	-0.079 (0.064)	-0.091 (0.091)	-0.089 (0.087)	-0.032 (0.029)	-0.027 (0.010)	-0.034 (0.028)	-0.025 (0.024)	-0.025 (0.021)	-0.033 (0.032)	-0.028 (0.011)	-0.035 (0.031)	-0.024 (0.024)	-0.025 (0.024)
Fire	-0.016 (0.024)	-0.012 (0.006)	-0.018 (0.022)	-0.021 (0.030)	-0.024 (0.028)	-0.018 (0.025)	-0.014 (0.007)	-0.021 (0.023)	-0.008 (0.011)	-0.009 (0.010)	-0.044 (0.043)	-0.036 (0.014)	-0.049 (0.041)	-0.090 (0.086)	-0.101 (0.081)
Hail	-0.075 (0.058)	-0.058 (0.023)	-0.081 (0.055)	-0.120*† (0.067)	-0.123*† (0.064)	0.058* (0.035)	0.053 (0.018)	0.066 (0.032)	0.054 (0.034)	0.062* (0.032)	0.055 (0.038)	0.051 (0.020)	0.063* (0.034)	0.040 (0.028)	0.046* (0.026)

Panel O: labor force (growth rate)

IQR						MED						MED/IQR			
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3CI	0.029 (0.042)	0.027 (0.031)	0.014 (0.038)	0.026 (0.037)	0.013 (0.035)	0.021 (0.027)	0.019 (0.018)	0.013 (0.025)	0.019 (0.025)	0.012 (0.023)	0.030 (0.033)	0.029 (0.023)	0.022 (0.030)	0.033 (0.036)	0.024 (0.033)
MaxT	0.029 (0.025)	0.027 (0.018)	0.013 (0.023)	0.022 (0.019)	0.010 (0.017)	0.014 (0.016)	0.013 (0.011)	0.008 (0.014)	0.014 (0.016)	0.008 (0.014)	0.027 (0.033)	0.026 (0.023)	0.012 (0.030)	0.024 (0.030)	0.010 (0.027)
MinT	-0.119 (0.047)	-0.112 (0.045)	-0.083* (0.044)	-0.366 (0.288)	-0.253 (0.206)	-0.100 (0.047)	-0.094 (0.046)	-0.052 (0.046)	-0.171* (0.100)	-0.092 (0.085)	-0.114 (0.045)	-0.105 (0.043)	-0.066 (0.046)	-0.049† (0.131)	-0.002† (0.129)
Drought	0.086 (0.108)	0.087 (0.066)	0.087 (0.114)	0.087 (0.136)	0.036† (0.144)	0.051 (0.072)	0.050 (0.056)	0.068 (0.075)	0.058 (0.081)	0.078 (0.083)	0.045 (0.070)	0.043 (0.053)	0.065 (0.070)	0.045 (0.071)	0.066 (0.070)
Prec	0.010 (0.013)	0.010 (0.009)	0.007 (0.012)	0.011 (0.014)	0.007 (0.013)	0.035 (0.083)	0.035 (0.046)	0.015 (0.071)	0.031 (0.070)	0.013 (0.059)	0.023 (0.090)	0.023 (0.049)	0.002 (0.076)	0.025 (0.097)	0.002 (0.082)
Wind	-0.003 (0.076)	-0.005 (0.052)	0.002 (0.074)	-0.004 (0.090)	0.003 (0.087)	0.007 (0.037)	0.006 (0.026)	0.004 (0.036)	0.006 (0.028)	0.003 (0.025)	0.011 (0.041)	0.010 (0.027)	0.009 (0.039)	0.008 (0.029)	0.007 (0.028)
Fire	0.036 (0.026)	0.034* (0.018)	0.032 (0.025)	0.048 (0.039)	0.042 (0.038)	0.039 (0.028)	0.037* (0.020)	0.033 (0.028)	0.018 (0.015)	0.014 (0.014)	0.041 (0.053)	0.039 (0.037)	0.034 (0.048)	0.084 (0.105)	0.070 (0.096)
Hail	0.038 (0.084)	0.033 (0.054)	0.008 (0.084)	0.018† (0.095)	-0.006† (0.097)	0.029 (0.048)	0.028 (0.045)	0.030 (0.048)	0.027 (0.045)	0.028 (0.045)	0.014 (0.051)	0.013 (0.047)	0.014 (0.050)	0.011 (0.038)	0.010 (0.037)

Panel P: entry margin (excess labor force growth over employment growth)

IQR						MED						MED/IQR			
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3CI	-0.061 (0.037)	-0.054 (0.012)	-0.067 (0.034)	-0.055 (0.037)	-0.061* (0.034)	-0.023 (0.025)	-0.020 (0.007)	-0.027 (0.023)	-0.022 (0.023)	-0.024 (0.021)	-0.035 (0.031)	-0.030 (0.009)	-0.040 (0.028)	-0.038 (0.034)	-0.044 (0.031)
MaxT	-0.012 (0.027)	-0.008 (0.006)	-0.018 (0.025)	-0.009 (0.021)	-0.014 (0.020)	-0.013 (0.015)	-0.010 (0.004)	-0.015 (0.014)	-0.013 (0.016)	-0.015 (0.014)	-0.040 (0.030)	-0.035 (0.009)	-0.046* (0.027)	-0.036 (0.026)	-0.041* (0.023)
MinT	-0.072 (0.065)	-0.083 (0.034)	-0.073 (0.067)	-0.233 (0.295)	-0.234 (0.292)	-0.023 (0.061)	-0.030 (0.023)	-0.009 (0.061)	-0.040 (0.102)	-0.016 (0.104)	-0.043 (0.065)	-0.052* (0.027)	-0.033 (0.066)	0.120† (0.136)	0.135† (0.129)

Drought	-0.279* (0.157)	-0.267 (0.052)	-0.280* (0.153)	-0.361† (0.139)	-0.364† (0.133)	-0.143* (0.086)	-0.125 (0.028)	-0.135 (0.085)	-0.157 (0.071)	-0.151 (0.073)	-0.131 (0.084)	-0.115 (0.028)	-0.121 (0.083)	-0.129 (0.062)	-0.120* (0.065)
Prec	-0.012 (0.012)	-0.011 (0.003)	-0.014 (0.011)	-0.013 (0.013)	-0.016 (0.013)	-0.010 (0.080)	-0.009 (0.020)	-0.027 (0.075)	-0.009 (0.070)	-0.022 (0.063)	-0.015 (0.084)	-0.016 (0.024)	-0.033 (0.079)	-0.016 (0.092)	-0.036 (0.086)
Wind	-0.093 (0.072)	-0.079 (0.025)	-0.092 (0.071)	-0.106 (0.102)	-0.103 (0.098)	-0.038 (0.033)	-0.032 (0.012)	-0.040 (0.032)	-0.029 (0.026)	-0.029 (0.024)	-0.040 (0.035)	-0.033 (0.013)	-0.041 (0.034)	-0.028 (0.027)	-0.029 (0.027)
Fire	-0.018 (0.027)	-0.014 (0.007)	-0.021 (0.025)	-0.023 (0.034)	-0.027 (0.032)	-0.020 (0.028)	-0.016 (0.008)	-0.023 (0.026)	-0.009 (0.012)	-0.010 (0.011)	-0.051 (0.049)	-0.042 (0.017)	-0.057 (0.047)	-0.105 (0.097)	-0.117 (0.092)
Hail	-0.088 (0.064)	-0.067 (0.027)	-0.094 (0.061)	-0.136*† (0.076)	-0.140*† (0.072)	0.068* (0.040)	0.063 (0.021)	0.077 (0.037)	0.064 (0.040)	0.072* (0.037)	0.065 (0.043)	0.061 (0.023)	0.074* (0.040)	0.048 (0.032)	0.054* (0.030)

The table reports estimates from symmetric dynamic panel regressions for the annual growth rates of real GDP, of its private consumption and investment components, of persons employed and hours worked per person, of labor productivity growth measure by output per worker and output per hour worked, of the real product and consumption wage growth and their wedge, the change in the labor share of income, the change in the unemployment rate, the labor force growth rate and the entry margin in the labor market . The specifications include a country fixed-effects model (FE), the Breitung et al. (2019) bias-corrected estimator (BC-FE), the Autometrics-selected fixed-effects estimator (GTS-FE) and their IV version (FE-IV, GTS-FE-IV). All specifications include macro-financial controls for economic uncertainty, geopolitical risk, financial stress, and business cycle conditions. The conditioning variables are the climate uncertainty measure (IQR), the climate risk measure (Median), and their ratio (Med/IQR), computed from the E3CI composite index and from each of its components - extreme maximum and minimum temperature (MaxT, MinT), drought (Drought), extreme precipitation and wind (Prec, Wind), wildfires (Fire), and hail (Hail). Coefficients are scaled by the pooled standard deviation of the annual within-country change of the underlying series, so that they measure the impact of a typical annual change. The climate measures are Melly-Pons FE estimates. Bold figures denote statistical significance at the 10% level or better; those marked with an asterisk are significant at the 10% but not at the 5% level. Wherever the realized-measure IV is not identified (its Kleibergen–Paap rk LM test does not reject underidentification at the 5% level), the FE-IV and GTS-FE-IV columns report instead the strongest identified alternative design, selected by the larger first-stage Kleibergen–Paap F: † the two-measurement Wald IV (the measure instrumented by its counterpart from the other first stage); ‡ the forcing IV, instrumented by L.AGGI and L.AGGI2. Figures in italics denote cells left unidentified under all designs and should be read with caution.

Table A4-B: Pagan / realized-measure IV diagnostics, Melly-Pons FE measures: Durbin–Wu–Hausman and Kleibergen–Paap p-values, FE-IV and GTS-FE-IV

Panel A: real GDP growth rate													
	IQR				MED				MED/IQR				
	FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		
	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	
E3CI	0.471	0.005	0.516	0.005	0.059	0.010	0.075	0.009	0.044	0.004	0.049	0.004	
MaxT	0.359	0.017	0.425	0.016	0.063	0.009	0.079	0.009	0.040	0.010	0.040	0.010	
MinT	0.605	0.116	0.789	0.117	0.153	0.046	0.151	0.050	0.620	0.086	0.614	0.087	
Drought	0.933	0.609	0.855	0.609	0.658	0.034	0.480	0.034	0.324	0.031	0.219	0.031	
Prec	0.151	0.010	0.176	0.009	0.185	0.017	0.270	0.016	0.749	0.008	0.923	0.008	
Wind	0.249	0.023	0.171	0.024	0.148	0.020	0.142	0.021	0.130	0.013	0.132	0.013	
Fire	0.648	0.026	0.635	0.026	0.133	0.046	0.136	0.043	0.053	0.007	0.065	0.007	
Hail	0.141	0.232	0.142	0.227	0.099	0.008	0.149	0.009	0.653	0.008	0.556	0.008	

Panel B: real consumption growth rate													
	IQR				MED				MED/IQR				
	FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		
	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	
E3CI	0.316	0.006	0.370	0.005	0.035	0.010	0.043	0.009	0.028	0.004	0.031	0.004	
MaxT	0.195	0.018	0.276	0.017	0.045	0.010	0.065	0.009	0.065	0.010	0.069	0.010	
MinT	0.141	0.120	0.188	0.121	0.139	0.044	0.201	0.050	0.810	0.084	0.765	0.085	
Drought	0.678	0.631	0.686	0.629	0.826	0.036	0.651	0.036	0.536	0.035	0.413	0.034	
Prec	0.096	0.011	0.102	0.009	0.052	0.021	0.100	0.019	0.291	0.008	0.386	0.007	
Wind	0.771	0.025	0.610	0.027	0.265	0.020	0.255	0.021	0.314	0.013	0.324	0.012	
Fire	0.543	0.026	0.543	0.026	0.211	0.047	0.231	0.043	0.062	0.007	0.069	0.007	
Hail	0.245	0.249	0.240	0.241	0.024	0.008	0.030	0.009	0.552	0.007	0.649	0.008	

Panel C: real investment growth rate													
	IQR				MED				MED/IQR				
	FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		
	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	
E3CI	0.129	0.005	0.154	0.004	0.090	0.009	0.126	0.008	0.026	0.004	0.028	0.004	
MaxT	0.085	0.016	0.123	0.015	0.073	0.009	0.103	0.008	0.210	0.011	0.236	0.011	
MinT	0.570	0.132	0.545	0.132	0.441	0.045	0.749	0.053	0.606	0.083	0.420	0.084	
Drought	0.466	0.587	0.473	0.586	0.395	0.034	0.649	0.034	0.752	0.033	0.490	0.033	
Prec	0.836	0.008	0.794	0.008	0.120	0.009	0.222	0.008	0.646	0.005	0.774	0.005	
Wind	0.601	0.027	0.459	0.028	0.509	0.021	0.562	0.021	0.404	0.014	0.452	0.014	
Fire	0.182	0.025	0.224	0.025	0.495	0.046	0.632	0.040	0.025	0.007	0.030	0.006	
Hail	0.781	0.235	0.969	0.228	0.187	0.008	0.209	0.009	0.599	0.007	0.621	0.008	

Panel D: employed persons (growth rate)													
	IQR				MED				MED/IQR				
	FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		
	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	
E3CI	0.193	0.004	0.227	0.004	0.321	0.007	0.359	0.007	0.789	0.003	0.899	0.003	
MaxT	0.680	0.013	0.520	0.013	0.916	0.006	0.820	0.006	0.773	0.011	0.668	0.011	
MinT	0.925	0.143	0.799	0.139	0.643	0.041	0.967	0.046	0.618	0.078	0.791	0.078	
Drought	0.130	0.630	0.157	0.628	0.118	0.035	0.113	0.035	0.441	0.034	0.466	0.034	
Prec	0.193	0.007	0.251	0.007	0.742	0.008	0.914	0.008	0.660	0.004	0.587	0.004	
Wind	0.353	0.032	0.419	0.033	0.402	0.017	0.504	0.018	0.471	0.013	0.540	0.013	
Fire	0.199	0.023	0.238	0.023	0.214	0.040	0.260	0.035	0.750	0.006	0.907	0.006	
Hail	0.353	0.224	0.593	0.221	0.270	0.010	0.268	0.011	0.110	0.008	0.100	0.009	

Panel E: hours worked per employed person (growth rate)													
	IQR				MED				MED/IQR				
	FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		
	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	
E3CI	0.488	0.004	0.498	0.003	0.655	0.007	0.752	0.006	0.866	0.003	0.890	0.003	
MaxT	0.793	0.014	0.776	0.013	0.896	0.007	0.915	0.006	0.694	0.007	0.715	0.008	
MinT	0.552	0.111	0.516	0.111	0.873	0.040	0.764	0.043	0.591	0.080	0.612	0.082	
Drought	0.879	0.746	0.905	0.740	0.731	0.034	0.688	0.033	0.606	0.032	0.580	0.032	

Prec	0.928	0.007	0.946	0.006	0.403	0.019	0.410	0.014	0.615	0.005	0.604	0.005
Wind	0.802	0.039	0.766	0.038	0.836	0.021	0.814	0.022	0.992	0.012	0.979	0.012
Fire	0.119	0.021	0.126	0.021	0.523	0.042	0.532	0.035	0.791	0.006	0.793	0.005
Hail	0.378	0.268	0.360	0.251	0.968	0.009	0.898	0.011	0.125	0.008	0.129	0.008

Panel F: labor productivity – output per worker (growth rate)

	IQR				MED				MED/IQR			
	FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV	
	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p
E3CI	0.180	0.005	0.187	0.005	0.010	0.009	0.013	0.009	0.012	0.004	0.012	0.004
MaxT	0.170	0.013	0.186	0.013	0.012	0.008	0.015	0.008	0.009	0.009	0.010	0.009
MinT	0.624	0.104	0.669	0.104	0.109	0.039	0.111	0.041	0.531	0.070	0.504	0.071
Drought	0.150	0.622	0.142	0.621	0.275	0.028	0.243	0.029	0.191	0.029	0.177	0.029
Prec	0.015	0.008	0.015	0.008	0.049	0.019	0.059	0.018	0.395	0.006	0.427	0.006
Wind	0.087	0.024	0.085	0.024	0.038	0.019	0.038	0.019	0.019	0.012	0.018	0.012
Fire	0.423	0.027	0.457	0.026	0.033	0.046	0.034	0.043	0.031	0.007	0.036	0.007
Hail	0.068	0.267	0.069	0.264	0.024	0.009	0.027	0.010	0.481	0.009	0.500	0.009

Panel G: labor productivity – output per hour worked (growth rate)

	IQR				MED				MED/IQR			
	FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV	
	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p
E3CI	0.026	0.004	0.027	0.004	0.012	0.007	0.015	0.007	0.016	0.003	0.017	0.003
MaxT	0.025	0.011	0.022	0.011	0.007	0.006	0.011	0.005	0.011	0.008	0.011	0.008
MinT	0.524	0.106	0.550	0.108	0.164	0.037	0.178	0.039	0.464	0.071	0.468	0.072
Drought	0.141	0.683	0.127	0.681	0.521	0.036	0.436	0.036	0.424	0.034	0.388	0.034
Prec	0.011	0.006	0.012	0.006	0.025	0.018	0.029	0.017	0.194	0.005	0.217	0.004
Wind	0.174	0.033	0.172	0.032	0.030	0.018	0.030	0.019	0.015	0.010	0.016	0.010
Fire	0.030	0.022	0.030	0.021	0.025	0.039	0.025	0.033	0.007	0.006	0.007	0.006
Hail	0.112	0.286	0.117	0.276	0.023	0.010	0.023	0.009	0.082	0.009	0.079	0.009

Panel H: real product wage (growth rate)

	IQR				MED				MED/IQR			
	FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV	
	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p
E3CI	0.058	0.005	0.055	0.005	0.026	0.009	0.032	0.009	0.034	0.004	0.033	0.003
MaxT	0.035	0.014	0.030	0.014	0.017	0.008	0.020	0.008	0.045	0.010	0.052	0.010
MinT	0.364	0.133	0.311	0.134	0.078	0.037	0.133	0.040	0.216	0.074	0.324	0.077
Drought	0.161	0.621	0.176	0.623	0.134	0.034	0.083	0.037	0.537	0.032	0.373	0.033
Prec	0.011	0.007	0.014	0.007	0.034	0.012	0.085	0.011	0.260	0.004	0.394	0.004
Wind	0.264	0.034	0.254	0.033	0.132	0.018	0.176	0.019	0.068	0.011	0.092	0.012
Fire	0.236	0.025	0.349	0.025	0.050	0.047	0.081	0.040	0.136	0.007	0.132	0.007
Hail	0.083	0.298	0.119	0.288	0.026	0.009	0.024	0.009	0.042	0.008	0.038	0.008

Panel I: real consumption wage (growth rate)

	IQR				MED				MED/IQR			
	FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV	
	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p
E3CI	0.078	0.005	0.084	0.005	0.089	0.009	0.150	0.008	0.075	0.004	0.094	0.003
MaxT	0.182	0.013	0.331	0.012	0.054	0.007	0.084	0.006	0.058	0.009	0.094	0.009
MinT	0.189	0.132	0.164	0.133	0.387	0.037	0.962	0.039	0.387	0.074	0.666	0.077
Drought	0.144	0.633	0.169	0.636	0.184	0.032	0.125	0.033	0.722	0.030	0.536	0.031
Prec	0.038	0.007	0.072	0.006	0.090	0.010	0.376	0.008	0.339	0.004	0.526	0.003
Wind	0.302	0.032	0.305	0.032	0.167	0.018	0.236	0.019	0.088	0.012	0.123	0.012
Fire	0.284	0.025	0.417	0.026	0.123	0.049	0.207	0.042	0.154	0.007	0.196	0.006
Hail	0.243	0.298	0.373	0.287	0.026	0.009	0.033	0.010	0.052	0.008	0.051	0.008

Panel L: real wage wedge (growth rate)

Table 1: Results of the Hausman specification test												
E3CI	IQR				MED				MED/IQR			
	FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV	
	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p
	0.510	0.005	0.272	0.004	0.745	0.008	0.399	0.007	0.627	0.004	0.353	0.003

MaxT	0.118	0.015	0.048	0.014	0.697	0.007	0.860	0.007	0.251	0.008	0.337	0.009
MinT	0.122	0.135	0.148	0.137	0.352	0.039	0.172	0.038	0.792	0.077	0.672	0.079
Drought	0.708	0.644	0.780	0.644	0.436	0.036	0.386	0.037	0.280	0.032	0.297	0.032
Prec	0.877	0.008	0.523	0.007	0.614	0.013	0.972	0.009	0.373	0.005	0.504	0.004
Wind	0.880	0.036	0.830	0.035	0.745	0.019	0.917	0.020	0.676	0.012	0.838	0.013
Fire	0.422	0.024	0.519	0.025	0.842	0.047	0.490	0.042	0.779	0.006	0.522	0.006
Hail	0.110	0.294	0.061	0.281	0.980	0.009	0.715	0.011	0.733	0.008	0.908	0.008

Panel M: labor share (change)

	IQR				MED				MED/IQR			
	FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV	
	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p
E3CI	0.698	0.005	0.618	0.004	0.276	0.010	0.276	0.009	0.119	0.004	0.106	0.004
MaxT	0.836	0.018	0.732	0.016	0.349	0.009	0.336	0.008	0.112	0.010	0.090	0.011
MinT	0.405	0.090	0.455	0.091	0.659	0.031	0.525	0.032	0.209	0.080	0.286	0.081
Drought	0.424	0.693	0.524	0.693	0.382	0.044	0.466	0.046	0.499	0.035	0.488	0.035
Prec	0.947	0.008	0.735	0.007	0.254	0.021	0.209	0.015	0.972	0.005	0.882	0.005
Wind	1.000	0.041	0.878	0.040	0.419	0.022	0.281	0.023	0.546	0.013	0.399	0.013
Fire	0.610	0.023	0.515	0.023	0.453	0.047	0.325	0.042	0.404	0.006	0.363	0.006
Hail	0.179	0.381	0.084	0.360	0.828	0.008	0.677	0.009	0.106	0.008	0.113	0.008

Panel N: unemployment rate (change)

	IQR				MED				MED/IQR			
	FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV	
	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p
E3CI	0.511	0.004	0.438	0.003	0.587	0.007	0.585	0.006	0.775	0.003	0.824	0.003
MaxT	0.263	0.015	0.312	0.013	0.754	0.007	0.767	0.006	0.630	0.009	0.672	0.010
MinT	0.242	0.141	0.266	0.143	0.657	0.040	0.850	0.041	0.742	0.083	0.864	0.085
Drought	0.135	0.651	0.136	0.646	0.126	0.037	0.175	0.038	0.589	0.036	0.714	0.036
Prec	0.296	0.007	0.232	0.006	0.948	0.015	0.760	0.010	0.477	0.004	0.395	0.004
Wind	0.361	0.033	0.405	0.033	0.327	0.016	0.313	0.017	0.565	0.013	0.532	0.013
Fire	0.966	0.023	0.954	0.023	0.451	0.040	0.400	0.035	0.700	0.006	0.740	0.005
Hail	0.205	0.228	0.180	0.217	0.146	0.010	0.109	0.012	0.047	0.009	0.042	0.009

Panel O: labor force (growth rate)

	IQR				MED				MED/IQR			
	FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV	
	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p
E3CI	0.259	0.004	0.336	0.004	0.231	0.008	0.213	0.008	0.431	0.003	0.537	0.003
MaxT	0.557	0.015	0.876	0.014	0.878	0.007	0.869	0.006	0.706	0.009	0.660	0.009
MinT	0.075	0.142	0.146	0.140	0.149	0.036	0.476	0.039	0.132	0.072	0.342	0.072
Drought	0.375	0.667	0.397	0.664	0.448	0.035	0.255	0.036	0.723	0.036	0.596	0.035
Prec	0.293	0.008	0.446	0.007	0.707	0.015	0.867	0.012	0.939	0.005	0.836	0.004
Wind	0.734	0.037	0.689	0.037	0.752	0.019	0.849	0.022	0.780	0.013	0.788	0.013
Fire	0.096	0.024	0.099	0.023	0.174	0.044	0.190	0.043	0.460	0.007	0.375	0.006
Hail	0.867	0.276	0.829	0.264	0.659	0.009	0.735	0.012	0.615	0.008	0.520	0.008

Panel P: entry margin (excess labor force growth over employment growth)

	IQR				MED				MED/IQR			
	FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV	
	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p
E3CI	0.439	0.004	0.377	0.003	0.556	0.007	0.558	0.006	0.822	0.003	0.868	0.003
MaxT	0.291	0.015	0.345	0.013	0.762	0.007	0.774	0.005	0.647	0.009	0.685	0.010
MinT	0.239	0.141	0.264	0.142	0.643	0.039	0.830	0.040	0.664	0.081	0.781	0.082
Drought	0.141	0.653	0.142	0.648	0.104	0.037	0.149	0.038	0.502	0.036	0.628	0.036
Prec	0.283	0.007	0.222	0.006	0.926	0.015	0.748	0.010	0.529	0.004	0.446	0.004
Wind	0.337	0.033	0.380	0.033	0.312	0.016	0.301	0.018	0.557	0.013	0.528	0.013
Fire	0.951	0.023	0.947	0.023	0.440	0.041	0.397	0.036	0.792	0.006	0.825	0.005
Hail	0.189	0.230	0.164	0.219	0.140	0.010	0.105	0.012	0.045	0.009	0.041	0.009

The table reports, for each climate component and each conditional moment (IQR, Median, Median/IQR) of the Melly-Pons FE first stage, the diagnostics of the Pagan / realized-measure IV in which the observed counterpart of the measure is instrumented by the fitted one, for the country fixed-effects version (FE-IV) and the Autometrics-selected version (GTS-FE-IV): the p-value of the Durbin–Wu–Hausman endogeneity test (H0: treating the measure as exogenous yields consistent estimates) and the p-value of the Kleibergen–Paap rk LM underidentification test (H0: the first stage is underidentified). KP p-values in *italics* (0.05 or above) denote instruments too weak for the corresponding IV columns to be reliable; those columns are reported in *italics* in the coefficient tables.

Table A4-C: Dynamic panel regressions with country fixed effects and macro-financial controls: climate change risk and uncertainty impact by estimator

Panel A: real GDP growth rate															
	IQR					MED					MED/IQR				
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3CI	-0.236 (0.104)	-0.233 (0.037)	-0.226 (0.101)	-0.124 (0.054)	-0.119 (0.053)	-0.224 (0.079)	-0.221 (0.031)	-0.215 (0.077)	-0.161 (0.048)	-0.151 (0.045)	-0.222 (0.089)	-0.217 (0.033)	-0.210 (0.088)	-0.200 (0.076)	-0.190 (0.076)
MaxT	-0.136 (0.052)	-0.129 (0.020)	-0.123 (0.052)	-0.095 (0.036)	-0.087 (0.036)	-0.132 (0.047)	-0.128 (0.020)	-0.124 (0.046)	-0.113 (0.039)	-0.105 (0.038)	-0.174* (0.093)	-0.168 (0.031)	-0.161* (0.092)	-0.134* (0.080)	-0.124 (0.078)
MinT	0.325 (0.253)	0.340 (0.082)	0.324 (0.237)	0.743‡ (0.817)	0.743‡ (0.817)	0.397* (0.236)	0.400 (0.073)	0.393* (0.233)	0.353*† (0.212)	0.355*† (0.208)	0.458* (0.251)	0.465 (0.087)	0.461* (0.245)	0.305† (0.253)	0.324† (0.247)
Drought	-0.372 (0.470)	-0.418 (0.115)	-0.439 (0.468)	-0.129† (0.589)	-0.177† (0.568)	-0.476 (0.335)	-0.509 (0.106)	-0.527 (0.347)	-0.581 (0.500)	-0.237† (0.347)	-0.391 (0.345)	-0.423 (0.113)	-0.443 (0.358)	-0.355 (0.365)	-0.403 (0.378)
Prec	-0.362 (0.176)	-0.358 (0.049)	-0.350 (0.173)	-0.232 (0.110)	-0.225 (0.108)	-0.331 (0.250)	-0.299 (0.045)	-0.288 (0.251)	-0.254 (0.183)	-0.224 (0.188)	-0.283 (0.284)	-0.244 (0.049)	-0.233 (0.284)	-0.283 (0.270)	-0.231 (0.268)
Wind	-0.746* (0.424)	-0.772 (0.115)	-0.779* (0.437)	-0.507 (0.320)	-0.532 (0.341)	-0.429 (0.185)	-0.435 (0.062)	-0.430 (0.182)	-0.245 (0.089)	-0.245 (0.086)	-0.426 (0.184)	-0.433 (0.065)	-0.429 (0.181)	-0.307 (0.150)	-0.311 (0.148)
Fire	-0.279 (0.130)	-0.280 (0.047)	-0.275 (0.125)	-0.170 (0.075)	-0.167 (0.071)	-0.162 (0.079)	-0.160 (0.028)	-0.157 (0.076)	-0.066* (0.035)	-0.062* (0.032)	-0.291 (0.131)	-0.289 (0.054)	-0.260 (0.131)	-0.475 (0.214)	-0.425 (0.212)
Hail	-0.691* (0.353)	-0.734 (0.122)	-0.732 (0.355)	-0.725† (0.333)	-0.729† (0.323)	0.441 (0.202)	0.437 (0.083)	0.415 (0.207)	0.356 (0.131)	0.334 (0.137)	0.387 (0.183)	0.382 (0.082)	0.360* (0.188)	0.222 (0.097)	0.206 (0.098)
Panel B: real consumption growth rate															
	IQR					MED					MED/IQR				
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3CI	-0.262 (0.122)	-0.253 (0.054)	-0.220 (0.109)	-0.138 (0.067)	-0.116* (0.059)	-0.259 (0.083)	-0.251 (0.047)	-0.231 (0.074)	-0.186 (0.054)	-0.161 (0.045)	-0.274 (0.081)	-0.265 (0.052)	-0.240 (0.075)	-0.248 (0.071)	-0.217 (0.065)
MaxT	-0.184 (0.046)	-0.174 (0.032)	-0.158 (0.043)	-0.129 (0.041)	-0.111 (0.036)	-0.164 (0.047)	-0.158 (0.029)	-0.143 (0.042)	-0.140 (0.045)	-0.121 (0.038)	-0.242 (0.079)	-0.230 (0.049)	-0.202 (0.073)	-0.186 (0.065)	-0.156 (0.060)
MinT	0.288 (0.281)	0.293 (0.083)	0.267 (0.250)	0.966‡ (0.874)	0.966‡ (0.874)	0.439* (0.235)	0.433 (0.090)	0.398* (0.224)	0.296*† (0.177)	0.271† (0.180)	0.445 (0.272)	0.443 (0.101)	0.406 (0.249)	0.108† (0.214)	0.097† (0.214)
Drought	-0.191 (0.564)	-0.219 (0.108)	-0.207 (0.554)	0.211† (0.678)	0.196† (0.649)	-0.446 (0.393)	-0.467 (0.116)	-0.458 (0.397)	-0.057† (0.431)	-0.116† (0.426)	-0.371 (0.408)	-0.392 (0.122)	-0.387 (0.412)	-0.014† (0.428)	-0.079† (0.426)
Prec	-0.422 (0.157)	-0.412 (0.076)	-0.384 (0.151)	-0.273 (0.117)	-0.248 (0.107)	-0.664* (0.251)	-0.391 (0.091)	-0.525† (0.256)	-0.664† (0.240)	-0.525† (0.246)	-0.407 (0.284)	-0.364 (0.107)	-0.298 (0.284)	-0.404 (0.278)	-0.291 (0.270)
Wind	-0.790 (0.365)	-0.805 (0.151)	-0.795 (0.376)	-0.584 (0.291)	-0.586* (0.308)	-0.451 (0.196)	-0.450 (0.094)	-0.420 (0.189)	-0.257 (0.089)	-0.238 (0.083)	-0.449 (0.194)	-0.449 (0.100)	-0.418 (0.185)	-0.321 (0.144)	-0.302 (0.137)
Fire	-0.259 (0.164)	-0.253 (0.060)	-0.233 (0.145)	-0.158* (0.093)	-0.142* (0.082)	-0.151 (0.092)	-0.147 (0.037)	-0.134* (0.081)	-0.062* (0.035)	-0.053* (0.030)	-0.329 (0.138)	-0.321 (0.062)	-0.285 (0.126)	-0.540 (0.231)	-0.467 (0.209)
Hail	-0.534 (0.421)	-0.563 (0.135)	-0.541 (0.409)	-0.616† (0.416)	-0.593† (0.385)	0.627 (0.204)	0.612 (0.101)	0.572 (0.199)	0.506 (0.131)	0.462 (0.126)	0.580 (0.174)	0.565 (0.101)	0.527 (0.168)	0.332 (0.107)	0.300 (0.100)
Panel C: real investment growth rate															
	IQR					MED					MED/IQR				
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3CI	-0.143 (0.208)	-0.143 (0.097)	-0.040 (0.190)	-0.075 (0.108)	-0.021 (0.100)	-0.224 (0.167)	-0.223 (0.091)	-0.147 (0.148)	-0.161 (0.119)	-0.102 (0.102)	-0.206 (0.167)	-0.204 (0.103)	-0.114 (0.149)	-0.186 (0.151)	-0.103 (0.135)
MaxT	-0.229 (0.116)	-0.218 (0.063)	-0.153 (0.105)	-0.163 (0.081)	-0.110 (0.073)	-0.186* (0.110)	-0.181 (0.056)	-0.128 (0.099)	-0.159* (0.091)	-0.108 (0.081)	-0.280* (0.160)	-0.273 (0.093)	-0.174 (0.143)	-0.214* (0.122)	-0.133 (0.110)
MinT	0.368 (0.659)	0.419 (0.258)	0.274 (0.627)	0.645‡ (1.106)	0.645‡ (1.106)	0.449 (0.419)	0.470 (0.214)	0.290 (0.388)	0.494† (0.495)	0.284† (0.518)	0.598 (0.539)	0.623 (0.248)	0.456 (0.506)	0.313† (0.667)	0.127† (0.702)
Drought	0.556 (0.799)	0.456 (0.307)	0.537 (0.769)	0.750† (1.157)	0.759† (1.153)	0.071 (0.401)	0.004 (0.249)	0.038 (0.355)	0.480† (0.546)	0.322† (0.463)	0.151 (0.400)	0.084 (0.278)	0.101 (0.362)	0.527† (0.539)	0.344† (0.465)
Prec	-0.438 (0.273)	-0.439 (0.167)	-0.317 (0.244)	-0.276 (0.176)	-0.200 (0.152)	-0.544 (0.483)	-0.496* (0.255)	-0.307 (0.432)	-0.398 (0.345)	-0.227 (0.310)	-0.628 (0.514)	-0.568 (0.285)	-0.358 (0.456)	-0.609 (0.513)	-0.342 (0.441)
Wind	-0.550 (0.435)	-0.615* (0.348)	-0.544 (0.415)	-0.396 (0.318)	-0.391 (0.305)	-0.117 (0.228)	-0.140 (0.178)	-0.027 (0.204)	-0.068 (0.130)	-0.016 (0.116)	-0.113 (0.233)	-0.108 (0.191)	-0.022 (0.208)	-0.081 (0.161)	-0.016 (0.151)
Fire	-0.266 (0.309)	-0.275 (0.119)	-0.195 (0.291)	-0.162 (0.194)	-0.118 (0.181)	-0.193 (0.179)	-0.194 (0.073)	-0.144 (0.170)	-0.080 (0.082)	-0.058 (0.075)	-0.137 (0.307)	-0.143 (0.152)	-0.035 (0.289)	-0.224 (0.504)	-0.058 (0.472)
Hail	-0.075 (0.516)	-0.180 (0.323)	-0.025 (0.493)	-0.270† (0.521)	-0.118† (0.489)	0.580 (0.372)	0.570 (0.194)	0.506 (0.336)	0.472 (0.311)	0.410 (0.275)	0.544 (0.379)	0.534 (0.205)	0.477 (0.340)	0.312 (0.231)	0.272 (0.205)
Panel D: employed persons (growth rate)															
	IQR					MED					MED/IQR				
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3CI	0.130* (0.069)	0.121 (0.030)	0.101 (0.066)	0.069* (0.037)	0.054 (0.035)	0.075 (0.052)	0.067 (0.023)	0.053 (0.047)	0.052 (0.038)	0.036 (0.033)	0.084* (0.048)	0.076 (0.025)	0.060 (0.044)	0.074* (0.044)	0.054 (0.040)

MaxT	0.033 (0.030)	0.030* (0.016)	0.020 (0.025)	0.024 (0.022)	0.014 (0.019)	0.041 (0.031)	0.037 (0.015)	0.028 (0.027)	0.035 (0.027)	0.024 (0.023)	0.074 (0.045)	0.069 (0.025)	0.052 (0.040)	0.057 (0.034)	0.040 (0.031)
MinT	-0.174 (0.166)	-0.158 (0.054)	-0.129 (0.165)	-0.346‡ (0.379)	-0.346‡ (0.379)	-0.109 (0.109)	-0.095 (0.044)	-0.061 (0.105)	-0.080‡ (0.104)	-0.025‡ (0.096)	-0.134 (0.141)	-0.119 (0.051)	-0.087 (0.134)	-0.088‡ (0.127)	-0.021‡ (0.118)
Drought	0.419* (0.216)	0.396 (0.081)	0.381* (0.226)	0.540*† (0.295)	0.506*† (0.307)	0.229 (0.140)	0.208 (0.062)	0.202 (0.144)	0.281*† (0.168)	0.272‡ (0.176)	0.239* (0.136)	0.220 (0.062)	0.217 (0.137)	0.262*† (0.158)	0.260‡ (0.163)
Prec	0.058 (0.080)	0.045 (0.031)	0.024 (0.071)	0.035 (0.051)	0.015 (0.044)	0.022 (0.123)	0.016 (0.047)	-0.014 (0.107)	0.016 (0.091)	-0.010 (0.080)	0.020 (0.145)	0.017 (0.051)	-0.015 (0.127)	0.019 (0.139)	-0.015 (0.120)
Wind	0.046 (0.176)	0.019 (0.060)	0.005 (0.170)	0.035 (0.135)	0.004 (0.128)	0.114 (0.098)	0.099 (0.043)	0.078 (0.092)	0.065 (0.062)	0.044 (0.056)	0.133 (0.101)	0.118 (0.045)	0.096 (0.096)	0.097 (0.081)	0.071 (0.075)
Fire	0.156 (0.096)	0.144 (0.034)	0.129 (0.093)	0.094 (0.063)	0.077 (0.060)	0.083 (0.057)	0.076 (0.020)	0.067 (0.054)	0.033 (0.024)	0.026 (0.022)	0.179 (0.089)	0.164 (0.042)	0.142 (0.086)	0.290 (0.141)	0.231* (0.137)
Hail	0.257 (0.202)	0.224 (0.067)	0.193 (0.203)	0.252‡ (0.217)	0.164‡ (0.206)	-0.115 (0.088)	-0.106 (0.048)	-0.098 (0.084)	-0.097 (0.081)	-0.081 (0.075)	-0.124 (0.085)	-0.116 (0.049)	-0.108 (0.080)	-0.071 (0.048)	-0.062 (0.046)

Panel E: hours worked per employed person (growth rate)

	IQR					MED					MED/IQR				
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3Ci	-0.025 (0.109)	-0.027 (0.021)	-0.025 (0.099)	-0.013 (0.057)	-0.013 (0.052)	-0.019 (0.081)	-0.022 (0.016)	-0.020 (0.073)	-0.014 (0.059)	-0.014 (0.050)	-0.019 (0.081)	-0.020 (0.017)	-0.019 (0.074)	-0.017 (0.072)	-0.016 (0.065)
MaxT	0.001 (0.039)	0.001 (0.010)	0.000 (0.035)	0.000 (0.027)	0.000 (0.025)	-0.004 (0.043)	-0.004 (0.009)	-0.004 (0.039)	-0.003 (0.038)	-0.003 (0.034)	-0.022 (0.069)	-0.022 (0.016)	-0.021 (0.062)	-0.017 (0.053)	-0.016 (0.048)
MinT	0.078 (0.156)	0.086 (0.043)	0.083 (0.149)	-0.041‡ (0.540)	-0.041‡ (0.540)	0.117 (0.154)	0.123 (0.033)	0.116 (0.143)	0.041‡ (0.099)	0.045‡ (0.091)	0.075 (0.165)	0.085 (0.037)	0.080 (0.154)	0.004‡ (0.127)	0.013‡ (0.118)
Drought	-0.171 (0.253)	-0.189 (0.051)	-0.180 (0.245)	0.031‡ (0.330)	0.020‡ (0.322)	-0.199 (0.189)	-0.213 (0.052)	-0.205 (0.185)	-0.092‡ (0.202)	-0.099‡ (0.196)	-0.164 (0.183)	-0.177 (0.052)	-0.170 (0.178)	-0.150 (0.177)	-0.090‡ (0.192)
Prec	-0.054 (0.128)	-0.057 (0.026)	-0.054 (0.117)	-0.033 (0.080)	-0.033 (0.074)	0.064 (0.132)	0.068 (0.047)	0.064 (0.128)	0.113‡ (0.125)	0.048 (0.089)	0.062 (0.148)	0.068 (0.054)	0.063 (0.144)	0.060 (0.142)	0.060 (0.134)
Wind	-0.304 (0.265)	-0.319 (0.051)	-0.309 (0.261)	-0.135‡ (0.304)	-0.241 (0.227)	-0.132 (0.165)	-0.138 (0.032)	-0.131 (0.154)	-0.081 (0.091)	-0.077 (0.082)	-0.117 (0.166)	-0.124 (0.032)	-0.117 (0.155)	-0.088 (0.117)	-0.087 (0.109)
Fire	0.022 (0.133)	0.017 (0.025)	0.018 (0.126)	0.013 (0.082)	0.011 (0.077)	0.030 (0.075)	0.028* (0.015)	0.027 (0.071)	0.012 (0.033)	0.011 (0.030)	0.003 (0.129)	0.000 (0.027)	0.001 (0.120)	0.005 (0.211)	0.002 (0.197)
Hail	-0.244 (0.276)	-0.263 (0.051)	-0.253 (0.261)	-0.226‡ (0.306)	-0.232‡ (0.286)	0.115 (0.097)	0.120 (0.030)	0.113 (0.093)	0.104 (0.080)	0.097 (0.074)	0.085 (0.078)	0.088 (0.029)	0.083 (0.075)	0.048 (0.044)	0.047 (0.042)

Panel F: labor productivity – output per worker (growth rate)

	IQR					MED					MED/IQR				
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3Ci	-0.435 (0.062)	-0.425 (0.040)	-0.425 (0.060)	-0.229 (0.033)	-0.224 (0.033)	-0.362 (0.052)	-0.353 (0.033)	-0.355 (0.050)	-0.254 (0.030)	-0.248 (0.029)	-0.374 (0.070)	-0.364 (0.034)	-0.366 (0.068)	-0.336 (0.060)	-0.330 (0.059)
MaxT	-0.223 (0.043)	-0.213 (0.022)	-0.215 (0.041)	-0.153 (0.032)	-0.148 (0.031)	-0.219 (0.034)	-0.212 (0.021)	-0.213 (0.033)	-0.186 (0.031)	-0.182 (0.030)	-0.312 (0.082)	-0.301 (0.031)	-0.303 (0.080)	-0.241 (0.082)	-0.234 (0.080)
MinT	0.544 (0.239)	0.546 (0.075)	0.541 (0.236)	1.818‡ (0.737)	1.818‡ (0.737)	0.579 (0.190)	0.571 (0.058)	0.569 (0.190)	0.485‡ (0.220)	0.479‡ (0.216)	0.655 (0.202)	0.650 (0.071)	0.648 (0.201)	0.451‡ (0.281)	0.448‡ (0.276)
Drought	-0.797 (0.383)	-0.824 (0.129)	-0.810 (0.384)	-0.669‡ (0.423)	-0.679*† (0.412)	-0.722 (0.284)	-0.739 (0.113)	-0.739 (0.288)	-0.879* (0.505)	-0.905* (0.516)	-0.646 (0.311)	-0.663 (0.116)	-0.657 (0.315)	-0.598 (0.391)	-0.609 (0.394)
Prec	-0.516 (0.142)	-0.503 (0.044)	-0.504 (0.140)	-0.338 (0.099)	-0.330 (0.097)	-0.495 (0.226)	-0.456 (0.065)	-0.466 (0.224)	-0.661‡ (0.224)	-0.616‡ (0.222)	-0.438* (0.265)	-0.395 (0.072)	-0.407 (0.263)	-0.458* (0.250)	-0.423* (0.248)
Wind	-0.844 (0.306)	-0.850 (0.100)	-0.847 (0.310)	-0.640* (0.327)	-0.641* (0.331)	-0.603 (0.131)	-0.599 (0.062)	-0.599 (0.128)	-0.343 (0.072)	-0.341 (0.068)	-0.616 (0.131)	-0.613 (0.064)	-0.613 (0.129)	-0.440 (0.143)	-0.440 (0.141)
Fire	-0.503 (0.083)	-0.495 (0.052)	-0.496 (0.080)	-0.306 (0.061)	-0.301 (0.059)	-0.294 (0.056)	-0.288 (0.032)	-0.288 (0.053)	-0.117 (0.035)	-0.115 (0.032)	-0.567 (0.104)	-0.554 (0.055)	-0.556 (0.104)	-0.926 (0.162)	-0.908 (0.163)
Hail	-0.976 (0.231)	-0.993 (0.109)	-0.984 (0.234)	-1.051‡ (0.212)	-1.052‡ (0.209)	0.625 (0.169)	0.614 (0.086)	0.616 (0.170)	0.514 (0.105)	0.508 (0.105)	0.575 (0.163)	0.564 (0.085)	0.566 (0.164)	0.334 (0.081)	0.329 (0.081)

Panel G: labor productivity – output per hour worked (growth rate)

	IQR					MED					MED/IQR				
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3Ci	-0.355 (0.087)	-0.340 (0.043)	-0.355 (0.081)	-0.186 (0.048)	-0.187 (0.047)	-0.305 (0.070)	-0.293 (0.036)	-0.303 (0.063)	-0.218 (0.058)	-0.212 (0.054)	-0.335 (0.075)	-0.322 (0.038)	-0.333 (0.069)	-0.296 (0.075)	-0.293 (0.070)
MaxT	-0.216 (0.041)	-0.206 (0.024)	-0.213 (0.038)	-0.153 (0.025)	-0.151 (0.026)	-0.198 (0.039)	-0.189 (0.022)	-0.196 (0.035)	-0.174 (0.031)	-0.170 (0.028)	-0.280 (0.074)	-0.268 (0.033)	-0.280 (0.070)	-0.217 (0.073)	-0.216 (0.070)
MinT	0.321 (0.219)	0.317 (0.067)	0.318 (0.219)	1.893‡ (0.762)	1.893‡ (0.762)	0.386 (0.138)	0.371 (0.058)	0.374 (0.167)	0.410*† (0.209)	0.396*† (0.203)	0.431 (0.163)	0.416 (0.069)	0.419 (0.163)	0.363‡ (0.266)	0.350‡ (0.259)
Drought	-0.292 (0.242)	-0.306 (0.123)	-0.318 (0.247)	-0.345‡ (0.225)	-0.366‡ (0.227)	-0.297 (0.225)	-0.304 (0.111)	-0.317 (0.227)	-0.338 (0.332)	-0.363 (0.343)	-0.287 (0.247)	-0.295 (0.107)	-0.308 (0.248)	-0.082‡ (0.270)	-0.112‡ (0.268)
Prec	-0.415 (0.119)	-0.395 (0.054)	-0.412 (0.112)	-0.260 (0.063)	-0.257 (0.059)	-0.572 (0.209)	-0.532 (0.079)	-0.562 (0.213)	-0.781‡ (0.198)	-0.770‡ (0.206)	-0.545 (0.251)	-0.502 (0.086)	-0.536 (0.257)	-0.560 (0.224)	-0.545 (0.226)

Wind	-0.348* (0.194)	-0.341 (0.109)	-0.348* (0.193)	-0.309 (0.204)	-0.300 (0.196)	-0.380 (0.126)	-0.367 (0.065)	-0.375 (0.119)	-0.226 (0.109)	-0.221 (0.100)	-0.413 (0.129)	-0.401 (0.067)	-0.408 (0.122)	-0.301 (0.147)	-0.297 (0.142)
Fire	-0.421 (0.092)	-0.407 (0.054)	-0.423 (0.086)	-0.255 (0.084)	-0.256 (0.081)	-0.273 (0.054)	-0.263 (0.034)	-0.272 (0.050)	-0.109 (0.044)	-0.110 (0.041)	-0.505 (0.116)	-0.488 (0.056)	-0.506 (0.109)	-0.827 (0.188)	-0.827 (0.179)
Hail	-0.450 (0.197)	-0.451 (0.114)	-0.458 (0.195)	-0.610† (0.228)	-0.609† (0.219)	0.402 (0.112)	0.387 (0.070)	0.400 (0.110)	0.364 (0.104)	0.349 (0.094)	0.404 (0.112)	0.390 (0.068)	0.402 (0.111)	0.233 (0.059)	0.231 (0.057)

Panel H: real product wage (growth rate)

	IQR					MED					MED/IQR				
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3CI	-0.348 (0.083)	-0.335 (0.052)	-0.339 (0.076)	-0.185 (0.053)	-0.180 (0.049)	-0.254 (0.061)	-0.242 (0.037)	-0.246 (0.059)	-0.190 (0.046)	-0.181 (0.044)	-0.271 (0.062)	-0.258 (0.040)	-0.263 (0.060)	-0.247 (0.061)	-0.239 (0.058)
MaxT	-0.161 (0.047)	-0.151 (0.031)	-0.157 (0.047)	-0.116 (0.047)	-0.113 (0.046)	-0.158 (0.042)	-0.150 (0.025)	-0.154 (0.041)	-0.138 (0.043)	-0.133 (0.042)	-0.253 (0.065)	-0.240 (0.041)	-0.246 (0.061)	-0.195 (0.054)	-0.191 (0.052)
MinT	0.324 (0.215)	0.313 (0.104)	0.279 (0.206)	1.222*† (0.684)	1.222*† (0.684)	0.363 (0.136)	0.345 (0.074)	0.357 (0.134)	0.290*† (0.161)	0.285*† (0.160)	0.458 (0.177)	0.441 (0.094)	0.452 (0.177)	0.224† (0.213)	0.220† (0.216)
Drought	-0.665 (0.204)	-0.673 (0.219)	-0.664 (0.214)	-0.606*† (0.318)	-0.598*† (0.331)	-0.598 (0.200)	-0.605 (0.151)	-0.603 (0.203)	-0.435† (0.268)	-0.488*† (0.271)	-0.576 (0.168)	-0.585 (0.153)	-0.589 (0.165)	-0.542 (0.191)	-0.441*† (0.256)
Prec	-0.294 (0.098)	-0.275 (0.054)	-0.267 (0.100)	-0.186 (0.076)	-0.168 (0.077)	-0.225 (0.139)	-0.190* (0.105)	-0.124 (0.131)	-0.466† (0.197)	-0.100 (0.118)	-0.250* (0.150)	-0.213 (0.109)	-0.142 (0.142)	-0.248 (0.156)	-0.139 (0.144)
Wind	-0.447 (0.143)	-0.443 (0.100)	-0.433 (0.156)	-0.376 (0.169)	-0.350 (0.176)	-0.400 (0.119)	-0.391 (0.066)	-0.384 (0.115)	-0.249 (0.074)	-0.226 (0.067)	-0.429 (0.116)	-0.421 (0.070)	-0.413 (0.115)	-0.319 (0.112)	-0.305 (0.107)
Fire	-0.374 (0.116)	-0.360 (0.067)	-0.352 (0.113)	-0.229 (0.074)	-0.217 (0.074)	-0.207 (0.082)	-0.197 (0.038)	-0.177 (0.080)	-0.084 (0.029)	-0.070 (0.027)	-0.412 (0.107)	-0.393 (0.069)	-0.402 (0.103)	-0.681 (0.199)	-0.661 (0.186)
Hail	-0.587 (0.193)	-0.588 (0.139)	-0.554 (0.204)	-0.628† (0.236)	-0.554† (0.229)	0.558 (0.124)	0.541 (0.105)	0.549 (0.114)	0.503 (0.143)	0.488 (0.133)	0.537 (0.098)	0.521 (0.108)	0.530 (0.092)	0.307 (0.075)	0.302 (0.069)

Panel I: real consumption wage (growth rate)

	IQR					MED					MED/IQR				
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3CI	-0.278 (0.098)	-0.264 (0.054)	-0.214 (0.103)	-0.148 (0.058)	-0.114* (0.058)	-0.194 (0.073)	-0.181 (0.042)	-0.144* (0.080)	-0.145 (0.053)	-0.102* (0.056)	-0.191 (0.075)	-0.176 (0.044)	-0.135 (0.083)	-0.174 (0.069)	-0.122* (0.074)
MaxT	-0.116 (0.051)	-0.103 (0.034)	-0.075 (0.054)	-0.084* (0.043)	-0.055 (0.042)	-0.122 (0.047)	-0.111 (0.029)	-0.087* (0.050)	-0.107 (0.044)	-0.074* (0.045)	-0.179 (0.075)	-0.164 (0.045)	-0.121 (0.078)	-0.140 (0.064)	-0.095 (0.063)
MinT	0.227 (0.232)	0.215 (0.104)	0.118 (0.234)	0.439‡ (0.635)	0.439‡ (0.635)	0.216 (0.159)	0.195 (0.079)	0.053 (0.173)	0.104† (0.187)	-0.074† (0.204)	0.354* (0.212)	0.334 (0.094)	0.277 (0.223)	0.018† (0.259)	-0.060† (0.269)
Drought	-0.630 (0.256)	-0.648 (0.176)	-0.622 (0.278)	-0.739† (0.355)	-0.720*† (0.377)	-0.539 (0.222)	-0.551 (0.136)	-0.533 (0.233)	-0.447† (0.321)	-0.499† (0.330)	-0.500 (0.191)	-0.517 (0.136)	-0.506 (0.198)	-0.472 (0.152)	-0.478 (0.133)
Prec	-0.186 (0.125)	-0.163 (0.055)	-0.114 (0.134)	-0.116 (0.079)	-0.071 (0.084)	-0.095 (0.147)	-0.052 (0.101)	0.041 (0.150)	-0.364*† (0.205)	0.033 (0.117)	-0.103 (0.157)	-0.059 (0.110)	0.044 (0.156)	-0.102 (0.159)	0.043 (0.152)
Wind	-0.305 (0.199)	-0.301 (0.108)	-0.271 (0.216)	-0.258 (0.203)	-0.220 (0.206)	-0.297 (0.140)	-0.291 (0.073)	-0.238* (0.144)	-0.186 (0.093)	-0.140* (0.084)	-0.323 (0.145)	-0.317 (0.077)	-0.262* (0.151)	-0.244* (0.084)	-0.197 (0.124)
Fire	-0.331 (0.142)	-0.316 (0.066)	-0.274* (0.151)	-0.204 (0.094)	-0.169* (0.098)	-0.176* (0.095)	-0.165 (0.040)	-0.140 (0.100)	-0.071* (0.037)	-0.055 (0.037)	-0.310 (0.124)	-0.288 (0.071)	-0.238* (0.133)	-0.513 (0.211)	-0.393* (0.217)
Hail	-0.435* (0.248)	-0.442 (0.130)	-0.387 (0.270)	-0.443† (0.284)	-0.352† (0.292)	0.484 (0.133)	0.463 (0.116)	0.425 (0.133)	0.437 (0.130)	0.375 (0.125)	0.458 (0.116)	0.438 (0.115)	0.405 (0.120)	0.261 (0.071)	0.229 (0.068)

Panel L: real wage wedge (growth rate)

	IQR					MED					MED/IQR				
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3CI	0.029 (0.040)	0.028 (0.025)	0.049 (0.038)	0.015 (0.021)	0.026 (0.020)	0.021 (0.035)	0.021 (0.018)	0.037 (0.031)	0.016 (0.026)	0.027 (0.023)	0.034 (0.036)	0.034 (0.021)	0.051 (0.032)	0.030 (0.033)	0.046 (0.030)
MaxT	0.010 (0.023)	0.011 (0.015)	0.023 (0.021)	0.008 (0.017)	0.017 (0.016)	0.009 (0.022)	0.009 (0.011)	0.020 (0.020)	0.008 (0.019)	0.017 (0.017)	0.028 (0.032)	0.028* (0.017)	0.045 (0.028)	0.022 (0.024)	0.035* (0.020)
MinT	-0.046 (0.074)	-0.047 (0.053)	-0.067 (0.077)	-0.270‡ (0.188)	-0.270‡ (0.188)	-0.074 (0.066)	-0.076 (0.027)	-0.101 (0.064)	-0.112† (0.087)	-0.136*† (0.082)	-0.036 (0.078)	-0.038 (0.036)	-0.065 (0.078)	-0.151† (0.120)	-0.171† (0.116)
Drought	0.065 (0.090)	0.060 (0.153)	0.080 (0.091)	-0.077† (0.154)	-0.063† (0.157)	0.082 (0.068)	0.078 (0.083)	0.096 (0.063)	0.049† (0.090)	0.046† (0.087)	0.108 (0.069)	0.102 (0.087)	0.117* (0.064)	0.053† (0.095)	0.047† (0.092)
Prec	0.036 (0.063)	0.038 (0.036)	0.061 (0.058)	0.022 (0.040)	0.037 (0.039)	0.014 (0.089)	0.017 (0.085)	0.051 (0.086)	-0.050† (0.101)	0.039 (0.068)	0.021 (0.094)	0.024 (0.084)	0.061 (0.092)	0.021 (0.092)	0.058 (0.087)
Wind	0.099 (0.078)	0.099* (0.055)	0.122 (0.075)	-0.029† (0.128)	0.003† (0.120)	0.071 (0.056)	0.069 (0.035)	0.091* (0.052)	0.044 (0.031)	0.052* (0.027)	0.073 (0.058)	0.071* (0.037)	0.094* (0.053)	0.055 (0.041)	0.070* (0.038)
Fire	0.002 (0.053)	0.002 (0.026)	0.024 (0.051)	0.001 (0.032)	0.015 (0.030)	0.002 (0.033)	0.002 (0.014)	0.016 (0.032)	0.001 (0.013)	0.006 (0.012)	0.044 (0.050)	0.043 (0.029)	0.068 (0.046)	0.072 (0.085)	0.111 (0.080)
Hail	0.137 (0.087)	0.134* (0.078)	0.161* (0.088)	0.162† (0.109)	0.194*† (0.104)	-0.016 (0.052)	-0.018 (0.039)	-0.043 (0.049)	-0.014 (0.047)	-0.037 (0.045)	-0.021 (0.051)	-0.022 (0.040)	-0.045 (0.049)	-0.012 (0.029)	-0.025 (0.029)

Panel M: labor share (change)

IQR						MED						MED/IQR			
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3CI	0.081	0.081	0.124	0.042	0.065	0.123	0.123	0.153*	0.093	0.110	0.139	0.139	0.171*	0.130	0.159*
	(0.117)	(0.049)	(0.117)	(0.060)	(0.060)	(0.090)	(0.039)	(0.090)	(0.071)	(0.068)	(0.093)	(0.044)	(0.093)	(0.090)	(0.092)
MaxT	0.088	0.087	0.107	0.062	0.075*	0.075	0.075	0.093	0.066	0.080*	0.100	0.098	0.131	0.077	0.102
	(0.069)	(0.029)	(0.067)	(0.041)	(0.039)	(0.061)	(0.023)	(0.060)	(0.050)	(0.047)	(0.091)	(0.036)	(0.092)	(0.074)	(0.076)
MinT	-0.149	-0.155*	-0.193	-0.394	-0.494	-0.256	-0.258	-0.305*	-0.265†	-0.321†	-0.199	-0.203	-0.256	-0.263†	-0.328†
	(0.198)	(0.085)	(0.205)	(0.661)	(0.703)	(0.174)	(0.077)	(0.177)	(0.363)	(0.351)	(0.207)	(0.083)	(0.209)	(0.426)	(0.411)
Drought	-0.181	-0.171	-0.126	-0.329†	-0.252†	-0.102	-0.097	-0.062	-0.302†	-0.267†	-0.116	-0.112	-0.083	-0.297†	-0.271†
	(0.334)	(0.242)	(0.342)	(0.437)	(0.434)	(0.300)	(0.188)	(0.300)	(0.374)	(0.370)	(0.296)	(0.187)	(0.301)	(0.355)	(0.357)
Prec	0.287	0.287	0.329	0.173	0.199	0.424*	0.420	0.487*	0.375†	0.444†	0.379	0.372	0.446*	0.373	0.432*
	(0.142)	(0.079)	(0.139)	(0.080)	(0.075)	(0.245)	(0.168)	(0.251)	(0.273)	(0.277)	(0.260)	(0.175)	(0.270)	(0.239)	(0.243)
Wind	0.319	0.323	0.368	0.107†	0.195†	0.164	0.165	0.215	0.105	0.124*	0.159	0.160*	0.213*	0.116	0.155
	(0.144)	(0.117)	(0.125)	(0.309)	(0.295)	(0.106)	(0.081)	(0.100)	(0.079)	(0.070)	(0.121)	(0.084)	(0.115)	(0.104)	(0.108)
Fire	0.106	0.109*	0.157	0.065	0.095	0.088	0.089	0.119	0.036	0.047	0.158	0.160	0.211	0.263	0.348
	(0.186)	(0.058)	(0.183)	(0.116)	(0.115)	(0.124)	(0.030)	(0.120)	(0.058)	(0.055)	(0.174)	(0.057)	(0.174)	(0.288)	(0.290)
Hail	0.177	0.184	0.252	0.209†	0.315†	-0.057	-0.056	-0.089	-0.055	-0.084	-0.057	-0.057	-0.086	-0.032	-0.048
	(0.227)	(0.158)	(0.225)	(0.257)	(0.250)	(0.125)	(0.100)	(0.123)	(0.118)	(0.112)	(0.113)	(0.099)	(0.114)	(0.063)	(0.063)

Panel N: unemployment rate (change)

IQR						MED						MED/IQR			
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3CI	-0.073	-0.066	-0.079	-0.038	-0.042	-0.038	-0.033	-0.044*	-0.028	-0.030	-0.042	-0.036	-0.048*	-0.037	-0.043*
	(0.034)	(0.031)	(0.031)	(0.018)	(0.017)	(0.027)	(0.008)	(0.025)	(0.021)	(0.018)	(0.028)	(0.008)	(0.025)	(0.026)	(0.023)
MaxT	-0.013	-0.011	-0.018	-0.009	-0.013	-0.019	-0.016	-0.023	-0.017	-0.020	-0.037	-0.033	-0.043*	-0.029	-0.034
	(0.019)	(0.004)	(0.018)	(0.015)	(0.014)	(0.018)	(0.004)	(0.016)	(0.016)	(0.015)	(0.025)	(0.007)	(0.022)	(0.019)	(0.017)
MinT	0.091	0.080	0.098	0.339	0.362	0.065	0.055	0.076	-0.025†	-0.009†	0.071	0.061	0.081	-0.053†	-0.039†
	(0.096)	(0.032)	(0.093)	(0.651)	(0.668)	(0.062)	(0.021)	(0.057)	(0.070)	(0.067)	(0.076)	(0.025)	(0.072)	(0.088)	(0.087)
Drought	-0.286	-0.268	-0.288	-0.336†	-0.338†	-0.165	-0.148	-0.166	-0.151†	-0.143†	-0.169	-0.153	-0.169	-0.142†	-0.132†
	(0.112)	(0.040)	(0.107)	(0.171)	(0.167)	(0.072)	(0.069)	(0.027)	(0.069)	(0.090)	(0.027)	(0.030)	(0.068)	(0.088)	(0.088)
Prec	-0.025	-0.017	-0.034	-0.015	-0.021	0.017	0.018	-0.002	-0.009†	-0.001	0.015	0.014	-0.006	0.014	-0.006
	(0.048)	(0.013)	(0.045)	(0.030)	(0.028)	(0.076)	(0.020)	(0.072)	(0.094)	(0.053)	(0.080)	(0.023)	(0.075)	(0.076)	(0.071)
Wind	-0.074	-0.055*	-0.078	-0.058	-0.059	-0.084*	-0.072	-0.091	-0.049	-0.050*	-0.086*	-0.074	-0.094	-0.064*	-0.070
	(0.071)	(0.032)	(0.069)	(0.062)	(0.058)	(0.043)	(0.017)	(0.040)	(0.030)	(0.026)	(0.045)	(0.017)	(0.042)	(0.036)	(0.035)
Fire	-0.068	-0.060	-0.073	-0.041	-0.043	-0.027	-0.022	-0.030	-0.011	-0.012	-0.080	-0.070	-0.088*	-0.129*	-0.141*
	(0.048)	(0.013)	(0.045)	(0.029)	(0.027)	(0.029)	(0.008)	(0.028)	(0.011)	(0.010)	(0.049)	(0.017)	(0.045)	(0.078)	(0.073)
Hail	-0.161*	-0.138	-0.167	-0.124†	-0.135†	0.101	0.093	0.108	0.083	0.088	0.096	0.088	0.103	0.055	0.059
	(0.086)	(0.034)	(0.083)	(0.092)	(0.089)	(0.041)	(0.020)	(0.039)	(0.039)	(0.039)	(0.038)	(0.021)	(0.036)	(0.023)	(0.023)

Panel O: labor force (growth rate)

IQR						MED						MED/IQR			
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3CI	0.040	0.038	0.018	0.021	0.009	0.024	0.022	0.008	0.017	0.006	0.030	0.028	0.010	0.026	0.009
	(0.042)	(0.032)	(0.042)	(0.022)	(0.022)	(0.036)	(0.025)	(0.034)	(0.027)	(0.024)	(0.036)	(0.026)	(0.034)	(0.033)	(0.030)
MaxT	0.018	0.017	0.005	0.013	0.004	0.017	0.016	0.006	0.015	0.005	0.029	0.028	0.008	0.023	0.006
	(0.023)	(0.016)	(0.019)	(0.016)	(0.014)	(0.022)	(0.015)	(0.019)	(0.019)	(0.017)	(0.032)	(0.024)	(0.028)	(0.025)	(0.022)
MinT	-0.040	-0.036	-0.014	-0.160†	-0.160†	-0.018	-0.014	0.025	-0.124†	-0.054†	-0.033	-0.028	-0.001	-0.165†	-0.095†
	(0.088)	(0.052)	(0.088)	(0.261)	(0.261)	(0.077)	(0.048)	(0.074)	(0.059)	(0.057)	(0.090)	(0.055)	(0.086)	(0.063)	(0.063)
Drought	0.040	0.037	0.032	0.112†	0.114†	-0.006	-0.008	-0.008	0.061†	0.081†	-0.002	-0.003	-0.000	0.055†	0.079†
	(0.119)	(0.077)	(0.126)	(0.142)	(0.150)	(0.092)	(0.064)	(0.095)	(0.085)	(0.089)	(0.095)	(0.062)	(0.095)	(0.084)	(0.085)
Prec	0.017	0.013	-0.011	0.011	-0.007	0.052	0.048	0.009	0.047†	0.006	0.048	0.045	0.001	0.046	0.001
	(0.064)	(0.037)	(0.057)	(0.039)	(0.036)	(0.089)	(0.047)	(0.077)	(0.110)	(0.056)	(0.102)	(0.051)	(0.087)	(0.096)	(0.083)
Wind	-0.091	-0.097	-0.109	-0.074	-0.086	-0.002	-0.005	-0.027	-0.001	-0.015	0.012	0.009	-0.015	0.009	-0.011
	(0.123)	(0.073)	(0.126)	(0.098)	(0.100)	(0.065)	(0.048)	(0.065)	(0.037)	(0.033)	(0.068)	(0.050)	(0.068)	(0.050)	(0.049)
Fire	0.066	0.063*	0.055	0.040	0.033	0.049	0.046	0.041	0.020	0.016	0.072	0.068*	0.053	0.117	0.086
	(0.055)	(0.038)	(0.056)	(0.037)	(0.037)	(0.031)	(0.023)	(0.032)	(0.016)	(0.015)	(0.056)	(0.040)	(0.055)	(0.090)	(0.089)
Hail	0.024	0.016	-0.008	0.063†	0.013†	0.032	0.031	0.034	0.026	0.027	0.018	0.017	0.019	0.010	0.011
	(0.129)	(0.079)	(0.134)	(0.138)	(0.139)	(0.059)	(0.051)	(0.059)	(0.046)	(0.047)	(0.057)	(0.050)	(0.057)	(0.033)	(0.033)

Panel P: entry margin (excess labor force growth over employment growth)

IQR						MED						MED/IQR			
	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV	FE	BC-FE	GTS-FE	FE-IV	GTS-FE-IV
E3CI	-0.083	-0.075	-0.089	-0.043	-0.047	-0.045	-0.038	-0.050*	-0.032	-0.034*	-0.049	-0.043	-0.056	-0.044	-0.050*
	(0.038)	(0.013)	(0.035)	(0.021)	(0.019)	(0.031)	(0.010)	(0.028)	(0.023)	(0.021)	(0.032)	(0.010)	(0.028)	(0.029)	(0.027)
MaxT	-0.015	-0.013	-0.021	-0.011	-0.015	-0.022	-0.019	-0.026	-0.019	-0.023	-0.042	-0.037	-0.049*	-0.033	-0.038
	(0.022)	(0.005)	(0.020)	(0.017)	(0.016)	(0.020)	(0.005)	(0.018)	(0.019)	(0.017)	(0.029)	(0.009)	(0.025)	(0.022)	(0.019)
MinT	0.103	0.090	0.110	0.379	0.405	0.074	0.063	0.086	-0.029†	-0.012†	0.080	0.069	0.091	-0.063†	-0.047†
	(0.111)	(0.038)	(0.107)	(0.729)	(0.750)	(0.071)	(0.024)	(0.065)	(0.079)	(0.077)	(0.088)	(0.029)	(0.082)	(0.100)	(0.099)

Drought	-0.318 (0.127)	-0.298 (0.048)	-0.321 (0.122)	-0.369*† (0.194)	-0.370† (0.189)	-0.189 (0.079)	-0.169 (0.032)	-0.190 (0.076)	-0.171*† (0.101)	-0.162† (0.099)	-0.195 (0.075)	-0.175 (0.036)	-0.194 (0.073)	-0.161*† (0.096)	-0.150† (0.096)
Prec	-0.031 (0.055)	-0.022 (0.015)	-0.041 (0.051)	-0.019 (0.034)	-0.025 (0.032)	0.016 (0.086)	0.018 (0.024)	-0.003 (0.082)	-0.013† (0.107)	-0.002 (0.060)	0.016 (0.092)	0.015 (0.027)	-0.007 (0.086)	0.015 (0.087)	-0.007 (0.082)
Wind	-0.091 (0.081)	-0.069* (0.037)	-0.095 (0.079)	-0.071 (0.071)	-0.072 (0.067)	-0.098 (0.048)	-0.084 (0.020)	-0.106 (0.045)	-0.057* (0.033)	-0.058* (0.030)	-0.102 (0.050)	-0.088 (0.021)	-0.110 (0.047)	-0.075* (0.041)	-0.081 (0.040)
Fire	-0.077 (0.054)	-0.067 (0.016)	-0.082 (0.051)	-0.046 (0.033)	-0.049 (0.031)	-0.030 (0.033)	-0.025 (0.009)	-0.034 (0.031)	-0.012 (0.012)	-0.013 (0.011)	-0.092* (0.055)	-0.080 (0.020)	-0.100* (0.051)	-0.148* (0.088)	-0.161* (0.082)
Hail	-0.183* (0.097)	-0.157 (0.040)	-0.189 (0.093)	-0.144† (0.103)	-0.156† (0.098)	0.118 (0.047)	0.108 (0.023)	0.126 (0.044)	0.096 (0.044)	0.103 (0.044)	0.113 (0.043)	0.104 (0.024)	0.120 (0.040)	0.065 (0.027)	0.069 (0.026)

The table reports estimates from symmetric dynamic panel regressions for the annual growth rates of real GDP, of its private consumption and investment components, of persons employed and hours worked per person, of labor productivity growth measure by output per worker and output per hour worked, of the real product and consumption wage growth and their wedge, the change in the labor share of income, the change in the unemployment rate, the labor force growth rate and the entry margin in the labor market . The specifications include a country fixed-effects model (FE), the Breitung et al. (2019) bias-corrected estimator (BC-FE), the Autometrics-selected fixed-effects estimator (GTS-FE) and their IV version (FE-IV, GTS-FE-IV). All specifications include macro-financial controls for economic uncertainty, geopolitical risk, financial stress, and business cycle conditions. The conditioning variables are the climate uncertainty measure (IQR), the climate risk measure (Median), and their ratio (Med/IQR), computed from the E3CI composite index and from each of its components - extreme maximum and minimum temperature (MaxT, MinT), drought (Drought), extreme precipitation and wind (Prec, Wind), wildfires (Fire), and hail (Hail). Coefficients are scaled by the pooled standard deviation of the annual within-country change of the underlying series, so that they measure the impact of a typical annual change. The climate measures are per-country GETS estimates. Bold figures denote statistical significance at the 10% level or better; those marked with an asterisk are significant at the 10% but not at the 5% level. Wherever the realized-measure IV is not identified (its Kleibergen–Paap rk LM test does not reject underidentification at the 5% level), the FE-IV and GTS-FE-IV columns report instead the strongest identified alternative design, selected by the larger first-stage Kleibergen–Paap F: † the two-measurement Wald IV (the measure instrumented by its counterpart from the other first stage); ‡ the forcing IV, instrumented by L.AGGI and L.AGGI2. Figures in italics denote cells left unidentified under all designs and should be read with caution.

Table A4-D: Pagan / realized-measure IV diagnostics, per-country GETS measures: Durbin–Wu–Hausman and Kleibergen–Paap p-values, FE-IV and GTS-FE-IV

Panel A: real GDP growth rate													
	IQR				MED				MED/IQR				
	FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		
	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	
E3CI	0.757	0.007	0.788	0.007	0.039	0.008	0.050	0.008	0.038	0.003	0.043	0.003	
MaxT	0.283	0.008	0.346	0.008	0.044	0.005	0.057	0.005	0.020	0.006	0.020	0.006	
MinT	0.140	0.429	0.130	0.430	0.097	0.106	0.104	0.114	0.161	0.141	0.150	0.139	
Drought	0.549	0.511	0.453	0.515	0.162	0.049	0.157	0.051	0.095	0.047	0.102	0.047	
Prec	0.135	0.010	0.135	0.009	0.257	0.046	0.319	0.049	0.988	0.014	0.939	0.013	
Wind	0.211	0.027	0.188	0.029	0.087	0.017	0.090	0.018	0.071	0.019	0.071	0.020	
Fire	0.570	0.022	0.577	0.022	0.145	0.044	0.148	0.040	0.111	0.006	0.133	0.006	
Hail	0.148	0.323	0.142	0.317	0.092	0.015	0.124	0.018	0.578	0.012	0.531	0.012	

Panel B: real consumption growth rate												
	IQR				MED				MED/IQR			
	FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV	
	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p
E3CI	0.706	0.008	0.827	0.008	0.031	0.009	0.037	0.008	0.036	0.003	0.050	0.003
MaxT	0.127	0.009	0.179	0.008	0.023	0.006	0.038	0.005	0.041	0.006	0.051	0.006
MinT	0.228	0.408	0.230	0.411	0.079	0.102	0.093	0.112	0.167	0.131	0.184	0.132
Drought	0.830	0.542	0.804	0.543	0.196	0.053	0.193	0.055	0.122	0.051	0.136	0.052
Prec	0.080	0.011	0.084	0.010	0.174	0.056	0.282	0.056	0.945	0.015	0.914	0.013
Wind	0.259	0.030	0.244	0.032	0.105	0.018	0.117	0.019	0.100	0.019	0.116	0.019
Fire	0.427	0.023	0.427	0.023	0.242	0.045	0.266	0.041	0.181	0.006	0.211	0.006
Hail	0.276	0.398	0.265	0.385	0.026	0.016	0.032	0.018	0.568	0.012	0.684	0.012

Panel C: real investment growth rate												
	IQR				MED				MED/IQR			
	FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV	
	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p
E3CI	0.478	0.007	0.665	0.007	0.130	0.008	0.209	0.007	0.050	0.003	0.080	0.003
MaxT	0.074	0.008	0.118	0.007	0.062	0.005	0.107	0.005	0.231	0.007	0.329	0.007
MinT	0.501	0.436	0.588	0.439	0.371	0.109	0.585	0.122	0.520	0.139	0.665	0.140
Drought	0.383	0.501	0.402	0.504	0.906	0.053	0.789	0.055	0.376	0.050	0.342	0.050
Prec	0.917	0.009	0.763	0.009	0.337	0.030	0.603	0.030	0.882	0.010	0.697	0.010
Wind	0.420	0.035	0.340	0.036	0.567	0.017	0.824	0.018	0.457	0.019	0.672	0.020
Fire	0.407	0.022	0.458	0.022	0.640	0.042	0.799	0.036	0.236	0.006	0.324	0.006
Hail	0.980	0.400	0.965	0.384	0.347	0.015	0.389	0.018	0.931	0.012	0.892	0.012

Panel D: employed persons (growth rate)												
	IQR				MED				MED/IQR			
	FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV	
	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p
E3CI	0.079	0.006	0.112	0.006	0.177	0.006	0.226	0.006	0.640	0.003	0.929	0.003
MaxT	0.704	0.006	0.513	0.006	0.986	0.004	0.816	0.004	0.725	0.006	0.499	0.007
MinT	0.384	0.468	0.512	0.456	0.421	0.131	0.653	0.134	0.410	0.146	0.517	0.141
Drought	0.104	0.536	0.131	0.538	0.170	0.056	0.190	0.057	0.369	0.052	0.475	0.053
Prec	0.496	0.008	0.797	0.008	0.889	0.028	0.825	0.029	0.824	0.009	0.883	0.009
Wind	0.770	0.044	0.983	0.044	0.252	0.015	0.404	0.017	0.288	0.018	0.413	0.019
Fire	0.082	0.020	0.103	0.020	0.160	0.039	0.200	0.033	0.117	0.005	0.270	0.006
Hail	0.257	0.372	0.400	0.366	0.171	0.017	0.176	0.019	0.068	0.012	0.065	0.013

Panel E: hours worked per employed person (growth rate)												
	IQR				MED				MED/IQR			
	FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV	
	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p
E3CI	0.610	0.006	0.605	0.006	0.867	0.007	0.765	0.006	0.486	0.003	0.471	0.003
MaxT	0.967	0.006	0.995	0.006	0.698	0.004	0.667	0.003	0.845	0.004	0.803	0.005
MinT	0.592	0.426	0.561	0.422	0.464	0.123	0.442	0.121	0.763	0.146	0.730	0.144
Drought	0.559	0.585	0.531	0.582	0.301	0.054	0.279	0.053	0.326	0.049	0.306	0.050

Prec	0.427	0.009	0.404	0.008	0.638	0.069	0.635	0.048	0.852	0.010	0.848	0.010
Wind	0.295	0.050	0.288	0.049	0.427	0.020	0.410	0.017	0.431	0.016	0.418	0.016
Fire	0.112	0.019	0.118	0.018	0.523	0.040	0.532	0.033	0.968	0.005	0.971	0.005
Hail	0.351	0.419	0.332	0.379	0.515	0.017	0.541	0.020	0.111	0.012	0.118	0.012

Panel F: labor productivity – output per worker (growth rate)

	IQR				MED				MED/IQR			
	FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV	
	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p
E3CI	0.171	0.008	0.182	0.008	0.007	0.008	0.009	0.008	0.009	0.003	0.010	0.003
MaxT	0.140	0.006	0.155	0.006	0.012	0.005	0.015	0.004	0.007	0.005	0.008	0.005
MinT	0.038	0.413	0.039	0.413	0.017	0.111	0.020	0.115	0.036	0.129	0.037	0.129
Drought	0.086	0.536	0.085	0.537	0.082	0.038	0.082	0.039	0.055	0.042	0.058	0.042
Prec	0.034	0.009	0.036	0.008	0.102	0.054	0.121	0.052	0.791	0.011	0.830	0.010
Wind	0.128	0.030	0.128	0.031	0.030	0.018	0.031	0.018	0.016	0.019	0.017	0.019
Fire	0.257	0.024	0.272	0.023	0.031	0.045	0.033	0.042	0.025	0.007	0.028	0.006
Hail	0.060	0.442	0.061	0.436	0.021	0.018	0.024	0.019	0.188	0.013	0.197	0.013

Panel G: labor productivity – output per hour worked (growth rate)

	IQR				MED				MED/IQR			
	FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV	
	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p
E3CI	0.031	0.007	0.033	0.006	0.008	0.007	0.010	0.006	0.015	0.003	0.016	0.003
MaxT	0.023	0.005	0.021	0.005	0.004	0.003	0.006	0.003	0.005	0.005	0.005	0.005
MinT	0.178	0.439	0.183	0.438	0.037	0.126	0.042	0.132	0.074	0.138	0.076	0.138
Drought	0.249	0.536	0.226	0.536	0.201	0.049	0.182	0.047	0.165	0.050	0.159	0.050
Prec	0.030	0.008	0.028	0.007	0.055	0.072	0.061	0.074	0.441	0.010	0.474	0.009
Wind	0.406	0.045	0.414	0.044	0.036	0.019	0.037	0.018	0.026	0.015	0.028	0.015
Fire	0.014	0.021	0.014	0.020	0.024	0.038	0.024	0.032	0.012	0.006	0.012	0.006
Hail	0.109	0.583	0.113	0.553	0.032	0.021	0.033	0.019	0.064	0.014	0.063	0.014

Panel H: real product wage (growth rate)

	IQR				MED				MED/IQR			
	FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV	
	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p
E3CI	0.040	0.008	0.039	0.007	0.019	0.008	0.024	0.008	0.034	0.003	0.034	0.003
MaxT	0.031	0.006	0.026	0.007	0.010	0.004	0.010	0.004	0.039	0.006	0.045	0.006
MinT	0.113	0.426	0.160	0.419	0.025	0.144	0.025	0.147	0.032	0.132	0.033	0.133
Drought	0.042	0.515	0.049	0.517	0.010	0.056	0.010	0.060	0.042	0.049	0.034	0.050
Prec	0.030	0.008	0.041	0.008	0.142	0.054	0.471	0.047	0.849	0.008	0.670	0.008
Wind	0.206	0.048	0.228	0.046	0.035	0.017	0.044	0.016	0.016	0.020	0.020	0.018
Fire	0.116	0.022	0.140	0.022	0.050	0.046	0.082	0.039	0.192	0.006	0.193	0.006
Hail	0.055	0.581	0.077	0.539	0.008	0.018	0.007	0.018	0.017	0.012	0.016	0.012

Panel I: real consumption wage (growth rate)

	IQR				MED				MED/IQR			
	FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV	
	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p
E3CI	0.108	0.008	0.144	0.007	0.095	0.008	0.183	0.007	0.143	0.003	0.232	0.003
MaxT	0.101	0.006	0.187	0.006	0.031	0.004	0.060	0.004	0.055	0.005	0.126	0.005
MinT	0.237	0.420	0.500	0.414	0.116	0.145	0.614	0.124	0.069	0.131	0.119	0.130
Drought	0.089	0.507	0.104	0.510	0.025	0.051	0.026	0.055	0.133	0.047	0.123	0.048
Prec	0.196	0.008	0.356	0.008	0.580	0.051	0.689	0.036	0.562	0.008	0.373	0.007
Wind	0.652	0.048	0.687	0.045	0.112	0.017	0.202	0.017	0.056	0.019	0.103	0.019
Fire	0.193	0.022	0.274	0.023	0.134	0.048	0.223	0.041	0.450	0.006	0.596	0.006
Hail	0.178	0.585	0.251	0.540	0.008	0.018	0.011	0.019	0.032	0.012	0.040	0.012

Panel L: real wage wedge (growth rate)

IQR MED MED/IQR												
IQR				MED				MED/IQR				
FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		FE-IV		GTS-FE-IV		
	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p	DWH p	KP p
E3CI	0.063	0.007	0.042	0.007	0.212	0.008	0.089	0.007	0.051	0.003	0.028	0.003

Table A5-A: Dynamic panel regressions with country fixed effects and macro-financial controls: climate change uncertainty (IQR) impact (Melly-Pons FE and per-country GETS estimators)

Panel A: real GDP growth rate												
	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	-0.471 (0.356)	-0.230* (0.131)	-0.317 (0.232)	-4.243 (1.272)	0.274 (0.102)	0.335	-0.510 (0.351)	-0.234* (0.133)	-0.313 (0.238)	-4.322 (1.250)	0.283 (0.105)	0.329
MaxT	-0.406 (0.379)	-0.143 (0.105)	-0.390* (0.234)	-4.160 (1.296)	0.269 (0.104)	0.329	-0.388 (0.380)	-0.165 (0.109)	-0.360 (0.234)	-4.223 (1.292)	0.264 (0.104)	0.331
MinT	-0.395 (0.344)	-0.309* (0.158)	-0.382 (0.245)	-4.275 (1.384)	0.309 (0.107)	0.324	-0.567 (0.386)	-0.156 (0.177)	-0.235 (0.299)	-4.584 (1.443)	0.320 (0.103)	0.329
Drought	-0.480 (0.349)	-0.289 (0.133)	-0.318 (0.351)	-4.380 (1.497)	0.317 (0.109)	0.324	-0.595 (0.392)	-0.286* (0.148)	-0.246 (0.308)	-4.507 (1.432)	0.330 (0.103)	0.328
Prec	-0.436 (0.379)	-0.210* (0.109)	-0.373 (0.236)	-4.248 (1.284)	0.279 (0.103)	0.329	-0.435 (0.378)	-0.051 (0.121)	-0.459* (0.241)	-4.331 (1.258)	0.280 (0.102)	0.337
Wind	-0.510 (0.351)	-0.277 (0.120)	-0.514 (0.239)	-4.295 (1.203)	0.330 (0.101)	0.341	-0.485 (0.338)	-0.096 (0.160)	-0.662 (0.275)	-4.270 (1.133)	0.344 (0.087)	0.351
Fire	-0.498 (0.348)	-0.190* (0.103)	-0.368 (0.248)	-4.235 (1.311)	0.283 (0.104)	0.327	-0.559* (0.336)	-0.202* (0.117)	-0.324 (0.247)	-4.324 (1.273)	0.290 (0.105)	0.329
Hail	-0.528 (0.356)	-0.186 (0.148)	-0.465 (0.228)	-4.298 (1.157)	0.328 (0.104)	0.337	-0.673* (0.384)	-0.164 (0.168)	-0.344 (0.232)	-4.506 (1.224)	0.346 (0.096)	0.341
Panel B: real consumption growth rate												
	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	-0.273 (0.351)	0.052 (0.147)	-0.247 (0.302)	-4.100 (1.340)	0.243 (0.094)	0.253	-0.299 (0.356)	0.042 (0.129)	-0.253 (0.308)	-4.181 (1.345)	0.258 (0.098)	0.245
MaxT	-0.204 (0.371)	0.151 (0.131)	-0.330 (0.307)	-4.007 (1.378)	0.243 (0.097)	0.248	-0.182 (0.373)	0.133 (0.131)	-0.297 (0.309)	-4.073 (1.374)	0.234 (0.096)	0.251
MinT	-0.100 (0.349)	-0.122 (0.141)	-0.360 (0.303)	-4.124 (1.485)	0.255 (0.096)	0.241	-0.307 (0.406)	0.111 (0.183)	-0.224 (0.382)	-4.331 (1.569)	0.271 (0.097)	0.241
Drought	-0.129 (0.401)	0.030 (0.124)	-0.409 (0.413)	-3.925 (1.705)	0.268 (0.100)	0.238	-0.269 (0.429)	0.009 (0.123)	-0.281 (0.371)	-4.176 (1.573)	0.272 (0.098)	0.239
Prec	-0.233 (0.372)	0.078 (0.119)	-0.317 (0.308)	-4.097 (1.357)	0.246 (0.094)	0.249	-0.227 (0.376)	0.247 (0.160)	-0.409 (0.314)	-4.193 (1.363)	0.250 (0.094)	0.253
Wind	-0.262 (0.347)	0.017 (0.127)	-0.473 (0.317)	-4.089 (1.290)	0.272 (0.094)	0.250	-0.236 (0.341)	0.205 (0.190)	-0.635 (0.295)	-4.062 (1.213)	0.281 (0.088)	0.260
Fire	-0.282 (0.349)	0.076 (0.107)	-0.304 (0.310)	-4.103 (1.395)	0.263 (0.096)	0.243	-0.326 (0.351)	0.066 (0.119)	-0.269 (0.311)	-4.174 (1.374)	0.265 (0.097)	0.244
Hail	-0.274 (0.356)	0.087 (0.145)	-0.407 (0.300)	-4.105 (1.296)	0.277 (0.098)	0.245	-0.364 (0.406)	0.101 (0.167)	-0.317 (0.311)	-4.240 (1.378)	0.281 (0.095)	0.246
Panel C: real investment growth rate												
	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	0.417 (0.484)	-0.701* (0.365)	-1.432 (0.499)	-8.458 (1.074)	0.254 (0.065)	0.201	0.479 (0.472)	-0.719* (0.382)	-1.508 (0.492)	-8.422 (1.039)	0.256 (0.066)	0.199
MaxT	0.468 (0.517)	-0.592 (0.380)	-1.496 (0.456)	-8.375 (1.077)	0.253 (0.065)	0.201	0.486 (0.516)	-0.622* (0.376)	-1.459 (0.466)	-8.454 (1.087)	0.252 (0.064)	0.202
MinT	0.611 (0.520)	-0.904* (0.470)	-1.553 (0.424)	-8.466 (1.135)	0.250 (0.062)	0.200	0.379 (0.526)	-0.621 (0.478)	-1.401 (0.672)	-8.683 (0.963)	0.258 (0.065)	0.200
Drought	0.743 (0.563)	-0.657* (0.381)	-1.786 (0.683)	-7.861 (1.018)	0.252 (0.065)	0.200	0.699 (0.487)	-0.717* (0.379)	-1.691 (0.570)	-8.086 (0.960)	0.251 (0.063)	0.200
Prec	0.443 (0.516)	-0.667* (0.355)	-1.491 (0.475)	-8.451 (1.083)	0.253 (0.064)	0.201	0.457 (0.508)	-0.538 (0.392)	-1.564 (0.460)	-8.540 (1.070)	0.256 (0.065)	0.201
Wind	0.433 (0.468)	-0.719 (0.364)	-1.642 (0.474)	-8.433 (1.014)	0.259 (0.066)	0.201	0.469 (0.452)	-0.588 (0.382)	-1.720 (0.469)	-8.412 (1.023)	0.261 (0.066)	0.201
Fire	0.356 (0.528)	-0.632* (0.361)	-1.465 (0.494)	-8.467 (1.050)	0.255 (0.065)	0.201	0.384 (0.515)	-0.680* (0.375)	-1.462 (0.510)	-8.498 (1.027)	0.257 (0.066)	0.200
Hail	0.483 (0.488)	-0.708* (0.390)	-1.538 (0.445)	-8.408 (1.049)	0.257 (0.067)	0.199	0.492 (0.493)	-0.719* (0.394)	-1.525 (0.458)	-8.405 (1.023)	0.256 (0.065)	0.199
Panel D: employed persons (growth rate)												
	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	0.115 (0.142)	-0.100 (0.080)	-0.091 (0.191)	-1.946 (0.549)	0.457 (0.053)	0.298	0.144 (0.141)	-0.104 (0.075)	-0.108 (0.194)	-1.900 (0.593)	0.454 (0.053)	0.300
MaxT	0.094 (0.140)	-0.113 (0.096)	-0.067 (0.191)	-1.970 (0.539)	0.461 (0.053)	0.297	0.091 (0.140)	-0.108 (0.096)	-0.072 (0.192)	-1.959 (0.538)	0.462 (0.052)	0.297
MinT	0.090 (0.142)	-0.098 (0.104)	-0.062 (0.193)	-1.971 (0.531)	0.464 (0.051)	0.296	0.145 (0.159)	-0.143 (0.104)	-0.120 (0.224)	-1.835 (0.601)	0.459 (0.051)	0.298
Drought	0.250 (0.152)	-0.051 (0.098)	-0.233 (0.218)	-1.616 (0.663)	0.457 (0.050)	0.306	0.229 (0.158)	-0.090 (0.083)	-0.176 (0.209)	-1.752 (0.653)	0.452 (0.049)	0.305
Prec	0.106 (0.137)	-0.108 (0.082)	-0.072 (0.187)	-1.950 (0.547)	0.458 (0.054)	0.298	0.092 (0.145)	-0.110 (0.105)	-0.059 (0.188)	-1.958 (0.548)	0.462 (0.052)	0.296
Wind	0.108 (0.148)	-0.095 (0.090)	-0.029 (0.174)	-1.956 (0.567)	0.456 (0.055)	0.298	0.089 (0.148)	-0.097 (0.110)	-0.060 (0.175)	-1.970 (0.537)	0.464 (0.049)	0.296
Fire	0.133 (0.144)	-0.121* (0.074)	-0.082 (0.182)	-1.943 (0.544)	0.457 (0.055)	0.299	0.167 (0.149)	-0.121* (0.066)	-0.105 (0.188)	-1.897 (0.577)	0.452 (0.054)	0.301
Hail	0.112 (0.147)	-0.116 (0.092)	-0.044 (0.179)	-1.953 (0.575)	0.455 (0.052)	0.297	0.150 (0.161)	-0.127 (0.089)	-0.071 (0.184)	-1.900 (0.610)	0.452 (0.050)	0.298
Panel E: hours worked per employed person (growth rate)												
	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	0.068 (0.179)	-0.097 (0.104)	0.166 (0.242)	-1.731 (1.141)	-0.223* (0.124)	0.138	0.056 (0.168)	-0.095 (0.108)	0.173 (0.242)	-1.739 (1.127)	-0.221* (0.122)	0.137
MaxT	0.072 (0.185)	-0.106 (0.103)	0.163 (0.240)	-1.731 (1.144)	-0.224* (0.124)	0.138	0.070 (0.188)	-0.099 (0.102)	0.163 (0.237)	-1.725 (1.125)	-0.223* (0.123)	0.137
MinT	0.057 (0.179)	-0.076 (0.100)	0.166 (0.239)	-1.718 (1.132)	-0.222* (0.124)	0.138	0.032 (0.202)	-0.068 (0.109)	0.196 (0.272)	-1.805 (1.207)	-0.217* (0.120)	0.138
Drought	0.077 (0.160)	-0.097 (0.112)	0.158 (0.272)	-1.716 (1.239)	-0.225* (0.122)	0.138	0.000 (0.171)	-0.100 (0.112)	0.213 (0.265)	-1.822 (1.179)	-0.211* (0.114)	0.141
Prec	0.075 (0.177)	-0.104 (0.094)	0.163 (0.240)	-1.725 (1.154)	-0.224* (0.123)	0.138	0.062 (0.193)	-0.066 (0.134)	0.153 (0.226)	-1.746 (1.124)	-0.219* (0.120)	0.139
Wind	0.053 (0.173)	-0.097 (0.114)	0.136 (0.238)	-1.730 (1.111)	-0.214* (0.118)	0.140	0.047 (0.182)	-0.025 (0.157)	0.037 (0.207)	-1.718* (1.035)	-0.192* (0.099)	0.155

Fire	0.099	-0.119	0.156	-1.719	-0.228*	0.140	0.081	-0.103	0.160	-1.722	-0.226*	0.138
	(0.157)	(0.084)	(0.239)	(1.161)	(0.121)		(0.154)	(0.097)	(0.244)	(1.165)	(0.122)	
Hail	0.035	-0.068	0.131	-1.734	-0.209*	0.143	-0.015	-0.055	0.165	-1.795	-0.198*	0.146
	(0.173)	(0.120)	(0.229)	(1.062)	(0.116)		(0.180)	(0.134)	(0.236)	(1.094)	(0.105)	

Panel F: labor productivity - output per worker (growth rate)

	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	-0.553	-0.112	-0.200	-2.428	0.118	0.237	-0.644	-0.108	-0.176	-2.570	0.138*	0.227
	(0.252)	(0.117)	(0.157)	(0.907)	(0.072)		(0.265)	(0.138)	(0.153)	(0.813)	(0.077)	
MaxT	-0.448	0.043	-0.320*	-2.292	0.107	0.219	-0.419	-0.002	-0.268*	-2.406	0.100	0.223
	(0.285)	(0.111)	(0.168)	(0.938)	(0.083)		(0.282)	(0.116)	(0.160)	(0.933)	(0.081)	
MinT	-0.428*	-0.201	-0.358	-2.331	0.178	0.172	-0.683	0.032	-0.118	-2.856	0.183	0.194
	(0.246)	(0.199)	(0.267)	(1.137)	(0.081)		(0.290)	(0.240)	(0.221)	(1.073)	(0.075)	
Drought	-0.672	-0.229	-0.127	-2.777	0.192	0.183	-0.762	-0.183	-0.111	-2.761	0.209	0.196
	(0.283)	(0.192)	(0.276)	(1.138)	(0.082)		(0.321)	(0.196)	(0.264)	(1.060)	(0.073)	
Prec	-0.492*	-0.060	-0.306*	-2.413	0.108	0.224	-0.483*	0.143	-0.429	-2.526	0.133	0.226
	(0.293)	(0.100)	(0.160)	(0.914)	(0.076)		(0.271)	(0.128)	(0.175)	(0.877)	(0.082)	
Wind	-0.549	-0.159	-0.542	-2.350	0.183	0.218	-0.495	0.042	-0.670	-2.302	0.192	0.219
	(0.232)	(0.135)	(0.200)	(0.907)	(0.070)		(0.222)	(0.180)	(0.235)	(0.855)	(0.065)	
Fire	-0.621	-0.030	-0.276	-2.405	0.144*	0.212	-0.721	-0.050	-0.201	-2.559	0.152	0.223
	(0.272)	(0.103)	(0.177)	(0.965)	(0.076)		(0.258)	(0.110)	(0.165)	(0.878)	(0.073)	
Hail	-0.590	-0.028	-0.478	-2.372	0.186	0.217	-0.764	-0.004	-0.316*	-2.617	0.206	0.220
	(0.242)	(0.177)	(0.180)	(0.775)	(0.073)		(0.265)	(0.186)	(0.178)	(0.836)	(0.064)	

Panel G: labor productivity - output per hour worked (growth rate)

	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	-0.436	-0.068	-0.274	-0.853	0.116	0.149	-0.497	-0.071	-0.254	-0.971	0.131	0.135
	(0.115)	(0.089)	(0.175)	(0.644)	(0.050)		(0.133)	(0.117)	(0.186)	(0.714)	(0.053)	
MaxT	-0.350	0.089	-0.378	-0.720	0.101*	0.147	-0.324	0.032	-0.331	-0.834	0.099*	0.148
	(0.093)	(0.085)	(0.158)	(0.595)	(0.056)		(0.096)	(0.096)	(0.161)	(0.611)	(0.054)	
MinT	-0.303	-0.190	-0.365*	-0.839	0.178	0.093	-0.467	-0.019	-0.232	-1.118*	0.180	0.101
	(0.205)	(0.200)	(0.217)	(0.652)	(0.060)		(0.195)	(0.230)	(0.195)	(0.656)	(0.058)	
Drought	-0.454	-0.168	-0.236	-1.064	0.185	0.096	-0.448*	-0.138	-0.269	-0.981	0.186	0.097
	(0.225)	(0.202)	(0.212)	(0.682)	(0.060)		(0.266)	(0.204)	(0.236)	(0.731)	(0.060)	
Prec	-0.395	-0.017	-0.365	-0.840	0.105	0.148	-0.361	0.124	-0.468	-0.934	0.127	0.131
	(0.101)	(0.079)	(0.158)	(0.651)	(0.052)		(0.123)	(0.136)	(0.160)	(0.686)	(0.058)	
Wind	-0.390	-0.120	-0.484	-0.826	0.173	0.111	-0.343*	-0.048	-0.498	-0.806	0.178	0.101
	(0.173)	(0.162)	(0.175)	(0.705)	(0.056)		(0.204)	(0.200)	(0.180)	(0.681)	(0.060)	
Fire	-0.509	0.021	-0.324	-0.853	0.131	0.137	-0.566	-0.011	-0.268	-0.970	0.140	0.134
	(0.115)	(0.092)	(0.165)	(0.651)	(0.053)		(0.128)	(0.097)	(0.177)	(0.696)	(0.051)	
Hail	-0.408	-0.048	-0.444	-0.834	0.175	0.110	-0.468	-0.051	-0.350*	-0.946	0.182	0.104
	(0.170)	(0.181)	(0.174)	(0.686)	(0.058)		(0.220)	(0.191)	(0.183)	(0.718)	(0.059)	

Panel H: real product wage (growth rate)

	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	-0.094	0.077	-0.448	-0.114	0.047	0.058	-0.152	0.082	-0.464	-0.172	0.026	0.055
	(0.109)	(0.109)	(0.190)	(0.313)	(0.071)		(0.123)	(0.110)	(0.194)	(0.308)	(0.067)	
MaxT	-0.003	0.169	-0.581	0.052	0.022	0.045	0.013	0.147	-0.544	-0.025	0.017	0.050
	(0.127)	(0.129)	(0.221)	(0.353)	(0.068)		(0.124)	(0.130)	(0.221)	(0.353)	(0.068)	
MinT	0.050	-0.046	-0.526	-0.162	0.094	0.034	-0.120	0.143	-0.397*	-0.404	0.094	0.037
	(0.138)	(0.194)	(0.256)	(0.449)	(0.072)		(0.136)	(0.197)	(0.223)	(0.367)	(0.072)	
Drought	-0.194	-0.010	-0.315*	-0.537	0.098	0.039	-0.246	0.037	-0.324*	-0.485	0.101	0.044
	(0.144)	(0.200)	(0.170)	(0.369)	(0.072)		(0.103)	(0.164)	(0.192)	(0.364)	(0.072)	
Prec	-0.035	0.107	-0.570	-0.033	0.020	0.050	-0.022	0.196	-0.598	-0.166	0.063	0.041
	(0.136)	(0.115)	(0.201)	(0.318)	(0.068)		(0.115)	(0.152)	(0.225)	(0.369)	(0.070)	
Wind	-0.060	0.045	-0.649	-0.155	0.093	0.047	-0.019	0.145	-0.680	-0.133	0.095	0.041
	(0.100)	(0.145)	(0.236)	(0.360)	(0.071)		(0.117)	(0.167)	(0.267)	(0.401)	(0.072)	
Fire	-0.106	0.118	-0.478	-0.168	0.083	0.043	-0.193	0.123	-0.451	-0.217	0.060	0.049
	(0.141)	(0.120)	(0.209)	(0.336)	(0.074)		(0.136)	(0.107)	(0.193)	(0.312)	(0.071)	
Hail	-0.068	0.113	-0.586	-0.163	0.096	0.041	-0.169	0.136	-0.498	-0.305	0.098	0.043
	(0.106)	(0.159)	(0.248)	(0.380)	(0.073)		(0.105)	(0.149)	(0.216)	(0.359)	(0.072)	

Panel I: real consumption wage (growth rate)

	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	-0.131	0.064	-0.621	-0.155	0.163	0.081	-0.166	0.066	-0.613	-0.229	0.171	0.078
	(0.158)	(0.175)	(0.283)	(0.506)	(0.069)		(0.166)	(0.187)	(0.284)	(0.513)	(0.070)	
MaxT	-0.070	0.096	-0.689	-0.093	0.171	0.072	-0.062	0.091	-0.671	-0.131	0.168	0.073
	(0.151)	(0.214)	(0.320)	(0.518)	(0.071)		(0.153)	(0.213)	(0.318)	(0.520)	(0.071)	
MinT	0.016	-0.099	-0.694	-0.205	0.181	0.075	-0.119	0.080	-0.589	-0.339	0.209	0.078
	(0.159)	(0.224)	(0.329)	(0.522)	(0.067)		(0.177)	(0.231)	(0.291)	(0.430)	(0.071)	
Drought	-0.300	-0.019	-0.433	-0.643*	0.194	0.079	-0.299	0.037	-0.507	-0.461	0.193	0.080
	(0.186)	(0.239)	(0.210)	(0.385)	(0.068)		(0.148)	(0.210)	(0.246)	(0.466)	(0.070)	
Prec	-0.093	0.083	-0.680	-0.142	0.165	0.077	-0.074	0.107	-0.715	-0.156	0.175	0.071
	(0.170)	(0.183)	(0.302)	(0.505)	(0.070)		(0.148)	(0.215)	(0.328)	(0.496)	(0.069)	
Wind	-0.127	0.045	-0.814	-0.154	0.185	0.083	-0.076	0.106	-0.798	-0.114	0.180	0.072
	(0.152)	(0.183)	(0.319)	(0.521)	(0.067)		(0.145)	(0.210)	(0.370)	(0.535)	(0.068)	
Fire	-0.155	0.108	-0.660	-0.149	0.169	0.076	-0.215	0.103	-0.617	-0.235	0.171	0.079
	(0.187)	(0.164)	(0.286)	(0.473)	(0.069)		(0.193)	(0.159)	(0.274)	(0.479)	(0.069)	
Hail	-0.108	0.087	-0.738	-0.134	0.182	0.073	-0.183	0.108	-0.682	-0.235	0.183	0.074
	(0.151)	(0.204)	(0.341)	(0.523)	(0.069)		(0.161)	(0.193)	(0.298)	(0.485)	(0.069)	

Panel L: real wage wedge (growth rate)

	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	-0.032 (0.074)	0.016 (0.071)	-0.221 (0.089)	0.108 (0.302)	0.085 (0.083)	0.020	-0.017 (0.070)	0.013 (0.074)	-0.231 (0.087)	0.131 (0.279)	0.084 (0.083)	0.021
MaxT	-0.038 (0.073)	-0.002 (0.075)	-0.215 (0.089)	0.099 (0.297)	0.086 (0.082)	0.021	-0.040 (0.073)	0.004 (0.073)	-0.221 (0.088)	0.111 (0.295)	0.086 (0.083)	0.020
MinT	0.000 (0.067)	-0.053 (0.081)	-0.218 (0.092)	0.065 (0.306)	0.082 (0.082)	0.023	-0.012 (0.087)	-0.006 (0.078)	-0.241 (0.091)	0.169 (0.311)	0.085 (0.083)	0.020
Drought	-0.061 (0.077)	0.014 (0.065)	-0.190* (0.101)	0.057 (0.349)	0.086 (0.084)	0.019	-0.011 (0.076)	0.019 (0.069)	-0.235 (0.089)	0.144 (0.301)	0.084 (0.084)	0.019
Prec	-0.038 (0.073)	0.015 (0.069)	-0.214 (0.091)	0.105 (0.307)	0.085 (0.083)	0.019	-0.035 (0.071)	-0.016 (0.076)	-0.202 (0.096)	0.130 (0.282)	0.085 (0.082)	0.021

Wind	-0.040 (0.073)	0.019 (0.066)	-0.211 (0.100)	0.101 (0.317)	0.085 (0.083)	0.019	-0.035 (0.071)	-0.010 (0.070)	-0.165 (0.108)	0.104 (0.278)	0.084 (0.083)	0.021
Fire	-0.039 (0.074)	0.018 (0.066)	-0.212 (0.090)	0.101 (0.315)	0.085 (0.083)	0.019	-0.027 (0.074)	0.013 (0.069)	-0.219 (0.088)	0.112 (0.303)	0.085 (0.083)	0.019
Hail	-0.017 (0.065)	-0.006 (0.071)	-0.188* (0.104)	0.116 (0.256)	0.081 (0.083)	0.023	0.008 (0.075)	-0.009 (0.072)	-0.217 (0.096)	0.154 (0.259)	0.082 (0.083)	0.022

Panel M: labor share (change)

	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	0.317* (0.176)	0.053 (0.145)	-0.160 (0.243)	1.159* (0.595)	-0.065 (0.046)	0.024	0.334 (0.170)	0.054 (0.146)	-0.162 (0.228)	1.200 (0.554)	-0.065 (0.047)	0.022
MaxT	0.295 (0.209)	-0.040 (0.133)	-0.130 (0.232)	1.124 (0.570)	-0.069 (0.044)	0.032	0.280 (0.206)	0.000 (0.136)	-0.153 (0.233)	1.184 (0.571)	-0.069 (0.045)	0.029
MinT	0.258 (0.175)	0.090 (0.116)	-0.107 (0.240)	1.130* (0.648)	-0.065 (0.047)	0.019	0.355* (0.199)	0.003 (0.138)	-0.196 (0.250)	1.326 (0.580)	-0.063 (0.048)	0.021
Drought	0.185 (0.202)	0.052 (0.157)	-0.019 (0.200)	0.948 (0.605)	-0.066 (0.047)	0.020	0.223 (0.225)	0.072 (0.154)	-0.071 (0.211)	1.056* (0.639)	-0.065 (0.047)	0.019
Prec	0.306 (0.192)	0.029 (0.134)	-0.131 (0.241)	1.163 (0.586)	-0.067 (0.045)	0.026	0.311 (0.201)	-0.114 (0.132)	-0.061 (0.243)	1.295 (0.519)	-0.066 (0.044)	0.036
Wind	0.286 (0.180)	0.069 (0.150)	-0.076 (0.278)	1.129* (0.618)	-0.064 (0.047)	0.020	0.285 (0.178)	-0.013 (0.148)	0.030 (0.266)	1.136 (0.545)	-0.063 (0.047)	0.025
Fire	0.351 (0.162)	0.014 (0.110)	-0.143 (0.250)	1.163* (0.604)	-0.064 (0.046)	0.024	0.362 (0.157)	0.031 (0.119)	-0.159 (0.243)	1.200 (0.576)	-0.064 (0.047)	0.023
Hail	0.311* (0.178)	0.031 (0.141)	-0.071 (0.261)	1.155 (0.547)	-0.064 (0.047)	0.022	0.346* (0.194)	0.028 (0.141)	-0.119 (0.240)	1.207 (0.549)	-0.063 (0.048)	0.021

Panel N: unemployment rate (change)

	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	-0.040 (0.083)	0.071 (0.045)	0.042 (0.085)	1.262 (0.155)	0.479 (0.047)	0.354	-0.064 (0.089)	0.075* (0.043)	0.056 (0.088)	1.226 (0.169)	0.472 (0.046)	0.358
MaxT	-0.023 (0.079)	0.079 (0.055)	0.022 (0.087)	1.282 (0.160)	0.488 (0.046)	0.349	-0.022 (0.078)	0.078 (0.052)	0.027 (0.088)	1.272 (0.158)	0.486 (0.046)	0.350
MinT	0.002 (0.071)	0.033 (0.071)	0.015 (0.089)	1.268 (0.151)	0.498 (0.043)	0.349	-0.063 (0.079)	0.103 (0.071)	0.063 (0.098)	1.181 (0.139)	0.483 (0.048)	0.351
Drought	-0.130 (0.084)	0.039 (0.051)	0.135 (0.107)	1.049 (0.185)	0.478 (0.044)	0.362	-0.127* (0.076)	0.065 (0.047)	0.107 (0.090)	1.119 (0.179)	0.470 (0.043)	0.363
Prec	-0.031 (0.082)	0.076 (0.047)	0.026 (0.084)	1.268 (0.155)	0.483 (0.047)	0.351	-0.025 (0.077)	0.087 (0.058)	0.015 (0.083)	1.265 (0.160)	0.486 (0.048)	0.349
Wind	-0.036 (0.081)	0.068 (0.052)	-0.004 (0.076)	1.270 (0.174)	0.476 (0.052)	0.352	-0.024 (0.076)	0.086 (0.058)	-0.008 (0.081)	1.278 (0.173)	0.482 (0.049)	0.350
Fire	-0.038 (0.084)	0.078 (0.052)	0.027 (0.085)	1.271 (0.158)	0.486 (0.048)	0.349	-0.065 (0.090)	0.083* (0.047)	0.044 (0.085)	1.240 (0.160)	0.477 (0.048)	0.353
Hail	-0.040 (0.083)	0.085 (0.057)	0.006 (0.080)	1.266 (0.181)	0.474 (0.051)	0.351	-0.074 (0.083)	0.096* (0.056)	0.029 (0.078)	1.221 (0.180)	0.470 (0.048)	0.354

Panel O: labor force (growth rate)

	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	0.077 (0.096)	-0.024 (0.059)	-0.051 (0.115)	-0.456 (0.451)	0.321 (0.054)	0.116	0.082 (0.090)	-0.024 (0.058)	-0.054 (0.116)	-0.449 (0.465)	0.321 (0.054)	0.116
MaxT	0.075 (0.094)	-0.032 (0.058)	-0.048 (0.113)	-0.461 (0.451)	0.320 (0.054)	0.116	0.073 (0.099)	-0.026 (0.061)	-0.048 (0.113)	-0.458 (0.447)	0.321 (0.054)	0.116
MinT	0.099 (0.097)	-0.065 (0.055)	-0.044 (0.113)	-0.485 (0.443)	0.298 (0.054)	0.105	0.079 (0.107)	-0.024 (0.058)	-0.046 (0.140)	-0.450 (0.505)	0.301 (0.055)	0.103
Drought	0.110 (0.092)	-0.010 (0.068)	-0.079 (0.133)	-0.386 (0.517)	0.301 (0.055)	0.104	0.084 (0.104)	-0.019 (0.064)	-0.049 (0.135)	-0.447 (0.502)	0.301 (0.055)	0.103
Prec	0.078 (0.092)	-0.027 (0.055)	-0.049 (0.112)	-0.454 (0.454)	0.320 (0.054)	0.116	0.071 (0.101)	-0.016 (0.068)	-0.048 (0.113)	-0.464 (0.451)	0.321 (0.053)	0.115
Wind	0.073 (0.099)	-0.019 (0.065)	-0.039 (0.110)	-0.463 (0.447)	0.301 (0.055)	0.103	0.068 (0.092)	0.004 (0.081)	-0.087 (0.102)	-0.461 (0.416)	0.324 (0.051)	0.118
Fire	0.103 (0.082)	-0.038 (0.041)	-0.052 (0.110)	-0.449 (0.459)	0.298 (0.055)	0.106	0.105 (0.084)	-0.031 (0.045)	-0.057 (0.115)	-0.436 (0.472)	0.299 (0.055)	0.105
Hail	0.074 (0.098)	-0.021 (0.061)	-0.038 (0.109)	-0.463 (0.452)	0.301 (0.054)	0.103	0.070 (0.104)	-0.018 (0.065)	-0.040 (0.119)	-0.466 (0.473)	0.301 (0.053)	0.103

Panel P: entry margin (excess labor force growth over employment growth)

	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	-0.042 (0.090)	0.082 (0.051)	0.051 (0.098)	1.415 (0.164)	0.476 (0.047)	0.343	-0.068 (0.097)	0.086* (0.050)	0.067 (0.101)	1.376 (0.179)	0.470 (0.045)	0.347
MaxT	-0.022 (0.086)	0.091 (0.062)	0.029 (0.100)	1.438 (0.172)	0.484 (0.045)	0.339	-0.021 (0.085)	0.090 (0.059)	0.035 (0.100)	1.427 (0.169)	0.483 (0.045)	0.339
MinT	0.006 (0.077)	0.038 (0.080)	0.021 (0.103)	1.422 (0.162)	0.494 (0.043)	0.339	-0.067 (0.086)	0.118 (0.082)	0.075 (0.114)	1.325 (0.149)	0.480 (0.047)	0.341
Drought	-0.139 (0.091)	0.047 (0.059)	0.153 (0.123)	1.182 (0.203)	0.476 (0.043)	0.350	-0.138* (0.083)	0.075 (0.054)	0.123 (0.104)	1.257 (0.192)	0.468 (0.042)	0.352
Prec	-0.031 (0.090)	0.088 (0.054)	0.034 (0.096)	1.422 (0.165)	0.480 (0.046)	0.341	-0.024 (0.084)	0.101 (0.065)	0.021 (0.094)	1.418 (0.171)	0.482 (0.047)	0.339
Wind	-0.037 (0.089)	0.078 (0.059)	-0.002 (0.085)	1.425 (0.186)	0.473 (0.051)	0.342	-0.024 (0.082)	0.101 (0.067)	-0.008 (0.091)	1.433 (0.186)	0.478 (0.049)	0.340
Fire	-0.038 (0.092)	0.090 (0.059)	0.035 (0.098)	1.427 (0.170)	0.482 (0.047)	0.339	-0.069 (0.099)	0.095* (0.054)	0.054 (0.098)	1.392 (0.170)	0.475 (0.047)	0.343
Hail	-0.042 (0.090)	0.098 (0.065)	0.010 (0.091)	1.420 (0.194)	0.471 (0.049)	0.341	-0.079 (0.090)	0.110* (0.065)	0.036 (0.089)	1.370 (0.192)	0.468 (0.047)	0.344

The table reports estimates from symmetric dynamic panel regressions for the annual growth rates of real GDP, of its private consumption and investment components, of persons employed, and of hours worked per person. The specifications include the Autometrics-selected country fixed-effects estimator (GTS-FE) and controls for economic uncertainty (DWUIE), geopolitical risk (GPR), financial stress (NCISS), and business cycle conditions (REC). The table also reports the estimated first-order autoregressive coefficient (lag1) and the coefficient of determination (R2). The conditioning variable is climate change uncertainty (IQR), computed from the E3CI composite index and from each of its components - extreme maximum and minimum temperature (MaxT, MinT), drought (Drought), extreme precipitation and wind (Prec, Wind), wildfires (Fire), and hail (Hail). The left-hand columns report the estimates obtained with the Melly-Pons fixed effects estimator; the right-hand columns those obtained with the per-country GETS estimator. Bold figures denote statistical significance at the 10% level or better; those marked with an asterisk are significant at the 10% but not at the 5% level.

Table A5-B: Dynamic panel regressions with country fixed effects and macro-financial controls: climate change risk (MED) impact (Melly-Pons FE and per-country GETS estimators)

Panel A: real GDP growth rate												
	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	-0.458 (0.370)	-0.179 (0.110)	-0.418* (0.238)	-4.181 (1.251)	0.275 (0.102)	0.335	-0.469 (0.367)	-0.170 (0.121)	-0.420* (0.232)	-4.222 (1.206)	0.280 (0.103)	0.336
MaxT	-0.442 (0.376)	-0.160 (0.107)	-0.386 (0.239)	-4.234 (1.273)	0.272 (0.103)	0.331	-0.441 (0.373)	-0.166 (0.116)	-0.361 (0.236)	-4.269 (1.259)	0.271 (0.103)	0.334
MinT	-0.491 (0.349)	-0.111 (0.153)	-0.322 (0.252)	-4.220 (1.364)	0.293 (0.105)	0.324	-0.547 (0.381)	-0.061 (0.172)	-0.279 (0.280)	-4.545 (1.391)	0.292 (0.101)	0.332
Drought	-0.483 (0.344)	-0.266* (0.146)	-0.393* (0.233)	-4.187 (1.301)	0.323 (0.108)	0.325	-0.528 (0.348)	-0.306 (0.154)	-0.396* (0.222)	-4.211 (1.248)	0.334 (0.101)	0.334
Prec	-0.330 (0.385)	-0.235 (0.102)	-0.418* (0.245)	-4.162 (1.375)	0.264 (0.102)	0.322	-0.350 (0.371)	-0.218 (0.103)	-0.441* (0.246)	-4.195 (1.351)	0.273 (0.108)	0.322
Wind	-0.429 (0.378)	-0.302 (0.118)	-0.518 (0.239)	-4.270 (1.206)	0.313 (0.105)	0.335	-0.421 (0.341)	-0.257* (0.135)	-0.589 (0.235)	-4.093 (1.104)	0.299 (0.100)	0.339
Fire	-0.496 (0.352)	-0.189* (0.104)	-0.391 (0.243)	-4.186 (1.289)	0.284 (0.105)	0.329	-0.521 (0.345)	-0.184* (0.109)	-0.360 (0.242)	-4.225 (1.290)	0.286 (0.105)	0.328
Hail	-0.409 (0.338)	-0.227 (0.141)	-0.335 (0.227)	-4.214 (1.356)	0.301 (0.102)	0.337	-0.440 (0.339)	-0.251 (0.155)	-0.364 (0.223)	-4.222 (1.297)	0.310 (0.101)	0.337
Panel B: real consumption growth rate												
	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	-0.257 (0.363)	0.102 (0.134)	-0.356 (0.309)	-4.044 (1.327)	0.250 (0.094)	0.252	-0.263 (0.361)	0.114 (0.141)	-0.366 (0.309)	-4.072 (1.293)	0.249 (0.096)	0.251
MaxT	-0.241 (0.369)	0.129 (0.128)	-0.328 (0.315)	-4.090 (1.356)	0.244 (0.094)	0.249	-0.241 (0.368)	0.124 (0.137)	-0.298 (0.314)	-4.131 (1.345)	0.242 (0.095)	0.251
MinT	-0.259 (0.353)	0.121 (0.175)	-0.278 (0.315)	-4.085 (1.443)	0.271 (0.098)	0.240	-0.332 (0.404)	0.222 (0.204)	-0.223 (0.371)	-4.395 (1.511)	0.259 (0.095)	0.247
Drought	-0.223 (0.356)	0.017 (0.127)	-0.345 (0.301)	-4.033 (1.397)	0.274 (0.100)	0.239	-0.274 (0.355)	-0.010 (0.127)	-0.360 (0.287)	-4.015 (1.329)	0.277 (0.098)	0.244
Prec	-0.095 (0.386)	0.048 (0.090)	-0.366 (0.306)	-4.004 (1.449)	0.233 (0.095)	0.245	-0.143 (0.367)	0.059 (0.100)	-0.382 (0.298)	-4.064 (1.431)	0.254 (0.100)	0.241
Wind	-0.196 (0.361)	-0.014 (0.125)	-0.479 (0.313)	-4.074 (1.301)	0.265 (0.096)	0.246	-0.204 (0.339)	0.023 (0.133)	-0.523* (0.290)	-3.954 (1.182)	0.267 (0.096)	0.252
Fire	-0.279 (0.348)	0.077 (0.112)	-0.325 (0.306)	-4.059 (1.373)	0.263 (0.097)	0.244	-0.296 (0.347)	0.080 (0.114)	-0.299 (0.306)	-4.093 (1.381)	0.265 (0.097)	0.243
Hail	-0.161 (0.325)	0.084 (0.153)	-0.300 (0.284)	-3.960 (1.432)	0.236 (0.094)	0.257	-0.211 (0.331)	0.046 (0.153)	-0.328 (0.277)	-4.005 (1.337)	0.255 (0.095)	0.257
Panel C: real investment growth rate												
	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	0.420 (0.507)	-0.641* (0.358)	-1.531 (0.475)	-8.399 (1.076)	0.254 (0.065)	0.202	0.444 (0.491)	-0.665* (0.373)	-1.529 (0.460)	-8.429 (1.055)	0.256 (0.066)	0.200
MaxT	0.427 (0.518)	-0.611* (0.368)	-1.491 (0.478)	-8.466 (1.070)	0.254 (0.064)	0.202	0.438 (0.504)	-0.636* (0.376)	-1.469 (0.480)	-8.494 (1.064)	0.254 (0.065)	0.201
MinT	0.424 (0.484)	-0.601 (0.479)	-1.451 (0.488)	-8.428 (1.051)	0.257 (0.065)	0.200	0.387 (0.494)	-0.574 (0.458)	-1.423 (0.549)	-8.671 (0.985)	0.258 (0.065)	0.200
Drought	0.573 (0.491)	-0.740* (0.389)	-1.507 (0.430)	-8.489 (1.142)	0.253 (0.064)	0.200	0.507 (0.459)	-0.721* (0.379)	-1.525 (0.440)	-8.399 (1.088)	0.255 (0.065)	0.199
Prec	0.601 (0.543)	-0.699 (0.338)	-1.542 (0.436)	-8.352 (1.141)	0.247 (0.061)	0.202	0.536 (0.488)	-0.687* (0.359)	-1.557 (0.438)	-8.410 (1.085)	0.253 (0.064)	0.200
Wind	0.494 (0.478)	-0.741 (0.376)	-1.608 (0.471)	-8.410 (1.037)	0.256 (0.066)	0.200	0.498 (0.470)	-0.722* (0.381)	-1.537 (0.443)	-8.391 (1.063)	0.256 (0.066)	0.199
Fire	0.384 (0.518)	-0.646* (0.364)	-1.501 (0.479)	-8.402 (1.048)	0.256 (0.066)	0.201	0.383 (0.522)	-0.654* (0.373)	-1.477 (0.483)	-8.437 (1.052)	0.256 (0.066)	0.200
Hail	0.510 (0.454)	-0.654* (0.376)	-1.455 (0.464)	-8.314 (1.169)	0.250 (0.065)	0.204	0.475 (0.445)	-0.700* (0.379)	-1.511 (0.468)	-8.352 (1.113)	0.254 (0.065)	0.202
Panel D: employed persons (growth rate)												
	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	0.107 (0.141)	-0.112 (0.081)	-0.062 (0.184)	-1.964 (0.549)	0.458 (0.054)	0.298	0.111 (0.142)	-0.115 (0.082)	-0.061 (0.185)	-1.954 (0.563)	0.456 (0.053)	0.298
MaxT	0.105 (0.139)	-0.116 (0.084)	-0.069 (0.187)	-1.952 (0.545)	0.458 (0.054)	0.297	0.104 (0.140)	-0.114 (0.086)	-0.075 (0.190)	-1.945 (0.549)	0.458 (0.053)	0.297
MinT	0.095 (0.152)	-0.106 (0.105)	-0.068 (0.203)	-1.967 (0.536)	0.463 (0.051)	0.296	0.112 (0.155)	-0.126 (0.104)	-0.083 (0.211)	-1.911 (0.591)	0.461 (0.051)	0.297
Drought	0.151 (0.146)	-0.108 (0.083)	-0.044 (0.185)	-2.048 (0.581)	0.453 (0.051)	0.301	0.124 (0.155)	-0.086 (0.093)	-0.055 (0.186)	-1.986 (0.568)	0.456 (0.050)	0.300
Prec	0.085 (0.144)	-0.097 (0.106)	-0.062 (0.193)	-1.971 (0.533)	0.464 (0.051)	0.296	0.090 (0.147)	-0.094 (0.111)	-0.063 (0.195)	-1.971 (0.531)	0.464 (0.051)	0.296
Wind	0.092 (0.142)	-0.087 (0.100)	-0.028 (0.185)	-1.961 (0.564)	0.459 (0.054)	0.298	0.093 (0.147)	-0.096 (0.096)	-0.030 (0.185)	-1.984 (0.564)	0.457 (0.051)	0.297
Fire	0.127 (0.144)	-0.118 (0.075)	-0.070 (0.182)	-1.963 (0.550)	0.455 (0.055)	0.298	0.145 (0.145)	-0.125* (0.070)	-0.085 (0.184)	-1.946 (0.554)	0.454 (0.055)	0.299
Hail	0.089 (0.146)	-0.101 (0.101)	-0.068 (0.197)	-1.974 (0.531)	0.463 (0.051)	0.297	0.094 (0.149)	-0.099 (0.094)	-0.066 (0.192)	-1.975 (0.543)	0.461 (0.051)	0.298
Panel E: hours worked per employed person (growth rate)												
	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	0.073 (0.177)	-0.101 (0.100)	0.165 (0.238)	-1.730 (1.142)	-0.225* (0.123)	0.138	0.062 (0.179)	-0.089 (0.114)	0.161 (0.232)	-1.728 (1.109)	-0.221* (0.121)	0.137
MaxT	0.073 (0.178)	-0.104 (0.100)	0.164 (0.240)	-1.727 (1.150)	-0.224* (0.123)	0.138	0.068 (0.181)	-0.095 (0.105)	0.164 (0.237)	-1.728 (1.127)	-0.223* (0.123)	0.137
MinT	0.058 (0.186)	-0.079 (0.109)	0.173 (0.240)	-1.729 (1.120)	-0.221* (0.122)	0.137	0.024 (0.203)	-0.040 (0.135)	0.196 (0.261)	-1.826 (1.179)	-0.215* (0.117)	0.142
Drought	0.047 (0.156)	-0.093 (0.109)	0.156 (0.238)	-1.697 (1.105)	-0.218* (0.120)	0.139	0.031 (0.165)	-0.106 (0.116)	0.152 (0.232)	-1.702 (1.082)	-0.208* (0.114)	0.144
Prec	0.053 (0.185)	-0.105 (0.089)	0.166 (0.241)	-1.731 (1.146)	-0.218* (0.120)	0.140	0.062 (0.189)	-0.107 (0.097)	0.171 (0.237)	-1.726 (1.150)	-0.222* (0.123)	0.138
Wind	0.068 (0.186)	-0.101 (0.107)	0.147 (0.234)	-1.725 (1.106)	-0.220* (0.120)	0.137	0.062 (0.186)	-0.094 (0.122)	0.103 (0.220)	-1.690* (1.023)	-0.209* (0.114)	0.145

Fire	0.089	-0.112	0.163	-1.731	-0.227*	0.139	0.093	-0.114	0.158	-1.725	-0.227*	0.139
	(0.160)	(0.089)	(0.239)	(1.153)	(0.122)		(0.156)	(0.091)	(0.241)	(1.158)	(0.122)	
	0.070	-0.090	0.171	-1.723	-0.222*		0.063	-0.092	0.164	-1.719	-0.218*	
Hail	(0.191)	(0.116)	(0.238)	(1.133)	(0.123)	0.140	(0.187)	(0.119)	(0.235)	(1.113)	(0.121)	0.142

Panel F: labor productivity - output per worker (growth rate)

	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	-0.529*	-0.026	-0.368	-2.318	0.121	0.233	-0.543	-0.010	-0.376	-2.383	0.123	0.238
	(0.276)	(0.092)	(0.161)	(0.882)	(0.074)		(0.268)	(0.110)	(0.150)	(0.788)	(0.076)	
MaxT	-0.508*	0.014	-0.314	-2.419	0.110	0.228	-0.504*	-0.000	-0.272*	-2.477	0.109	0.233
	(0.288)	(0.101)	(0.155)	(0.892)	(0.076)		(0.277)	(0.110)	(0.147)	(0.865)	(0.076)	
MinT	-0.571	0.038	-0.238	-2.348	0.178	0.187	-0.651	0.130	-0.170	-2.824	0.162	0.213
	(0.243)	(0.192)	(0.235)	(1.077)	(0.082)		(0.278)	(0.206)	(0.192)	(0.987)	(0.076)	
Drought	-0.564	-0.148	-0.379	-2.178	0.200	0.181	-0.589	-0.203	-0.379*	-2.240	0.204	0.200
	(0.252)	(0.200)	(0.231)	(1.013)	(0.079)		(0.241)	(0.191)	(0.215)	(0.965)	(0.072)	
Prec	-0.323	-0.127	-0.366*	-2.305	0.114	0.193	-0.373	-0.099	-0.402*	-2.339	0.143	0.186
	(0.288)	(0.148)	(0.221)	(1.101)	(0.080)		(0.266)	(0.175)	(0.240)	(1.056)	(0.089)	
Wind	-0.448*	-0.206	-0.576	-2.335	0.161	0.212	-0.462	-0.147	-0.609	-2.166	0.168	0.228
	(0.264)	(0.145)	(0.211)	(0.868)	(0.080)		(0.226)	(0.155)	(0.191)	(0.736)	(0.076)	
Fire	-0.606	-0.033	-0.322*	-2.313	0.144*	0.217	-0.660	-0.016	-0.263	-2.384	0.146*	0.217
	(0.273)	(0.101)	(0.175)	(0.931)	(0.076)		(0.271)	(0.106)	(0.169)	(0.918)	(0.077)	
Hail	-0.423	-0.102	-0.295	-2.263	0.146*	0.208	-0.464	-0.132	-0.338	-2.264	0.156	0.213
	(0.208)	(0.170)	(0.233)	(1.119)	(0.076)		(0.208)	(0.180)	(0.214)	(1.033)	(0.073)	

Panel G: labor productivity - output per hour worked (growth rate)

	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	-0.416	0.014	-0.424	-0.757	0.111	0.149	-0.419	0.016	-0.428	-0.808	0.118	0.145
	(0.099)	(0.068)	(0.155)	(0.650)	(0.051)		(0.110)	(0.085)	(0.155)	(0.673)	(0.052)	
MaxT	-0.406	0.052	-0.376	-0.844	0.106	0.149	-0.399	0.030	-0.340	-0.893	0.107	0.150
	(0.096)	(0.081)	(0.153)	(0.639)	(0.052)		(0.100)	(0.088)	(0.158)	(0.645)	(0.052)	
MinT	-0.425	0.030	-0.275	-0.834	0.175	0.104	-0.463	0.058	-0.260	-1.126*	0.164	0.112
	(0.156)	(0.195)	(0.204)	(0.641)	(0.061)		(0.164)	(0.203)	(0.178)	(0.678)	(0.058)	
Drought	-0.368*	-0.128	-0.369*	-0.764	0.186	0.093	-0.385*	-0.146	-0.374*	-0.777	0.185	0.098
	(0.217)	(0.213)	(0.203)	(0.657)	(0.060)		(0.227)	(0.196)	(0.199)	(0.672)	(0.060)	
Prec	-0.209*	-0.091	-0.416	-0.744	0.107*	0.130	-0.250*	-0.059	-0.451	-0.802	0.131	0.117
	(0.121)	(0.138)	(0.188)	(0.643)	(0.057)		(0.133)	(0.174)	(0.200)	(0.631)	(0.063)	
Wind	-0.337	-0.157	-0.537	-0.811	0.160	0.117	-0.333*	-0.116	-0.535	-0.707	0.162	0.117
	(0.141)	(0.161)	(0.177)	(0.698)	(0.058)		(0.175)	(0.161)	(0.173)	(0.678)	(0.059)	
Fire	-0.488	0.015	-0.369	-0.763	0.131	0.138	-0.534	0.032	-0.314*	-0.828	0.132	0.138
	(0.118)	(0.087)	(0.164)	(0.644)	(0.053)		(0.120)	(0.086)	(0.167)	(0.649)	(0.053)	
Hail	-0.318	-0.088	-0.332	-0.769	0.156	0.114	-0.343*	-0.111	-0.363*	-0.774	0.163	0.112
	(0.193)	(0.174)	(0.210)	(0.652)	(0.057)		(0.197)	(0.179)	(0.200)	(0.670)	(0.057)	

Panel H: real product wage (growth rate)

	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	-0.054	0.129	-0.615	0.028	0.022	0.052	-0.064	0.141	-0.620	-0.017	0.024	0.052
	(0.123)	(0.104)	(0.189)	(0.314)	(0.067)		(0.118)	(0.108)	(0.201)	(0.330)	(0.067)	
MaxT	-0.043	0.155	-0.577	-0.037	0.021	0.049	-0.045	0.149	-0.548	-0.079	0.019	0.053
	(0.127)	(0.112)	(0.203)	(0.328)	(0.067)		(0.118)	(0.113)	(0.204)	(0.330)	(0.067)	
MinT	-0.052	0.139	-0.506	-0.062	0.066	0.033	-0.120	0.221	-0.481	-0.311	0.037	0.041
	(0.119)	(0.193)	(0.242)	(0.434)	(0.070)		(0.112)	(0.185)	(0.226)	(0.383)	(0.064)	
Drought	-0.109	0.067	-0.544	0.017	0.105	0.040	-0.105	0.019	-0.544	-0.060	0.100	0.046
	(0.111)	(0.157)	(0.238)	(0.448)	(0.074)		(0.098)	(0.160)	(0.223)	(0.418)	(0.073)	
Prec	0.056	0.052	-0.529	-0.101	0.082	0.037	0.018	0.054	-0.532	-0.126	0.093	0.033
	(0.138)	(0.179)	(0.246)	(0.404)	(0.074)		(0.117)	(0.201)	(0.250)	(0.422)	(0.073)	
Wind	0.004	0.012	-0.653	-0.138	0.090	0.042	-0.005	0.052	-0.720	0.031	0.068	0.047
	(0.115)	(0.174)	(0.262)	(0.347)	(0.073)		(0.108)	(0.151)	(0.248)	(0.390)	(0.071)	
Fire	-0.095	0.116	-0.506	-0.112	0.083	0.044	-0.128	0.128	-0.470	-0.155	0.083	0.044
	(0.139)	(0.119)	(0.208)	(0.330)	(0.074)		(0.144)	(0.111)	(0.209)	(0.328)	(0.074)	
Hail	0.006	0.095	-0.505	0.001	0.056	0.051	-0.025	0.072	-0.542	-0.006	0.059	0.054
	(0.109)	(0.152)	(0.229)	(0.445)	(0.072)		(0.107)	(0.142)	(0.211)	(0.418)	(0.071)	

Panel I: real consumption wage (growth rate)

	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	-0.107	0.100	-0.710	-0.101	0.165	0.078	-0.107	0.098	-0.711	-0.129	0.170	0.076
	(0.168)	(0.167)	(0.296)	(0.508)	(0.069)		(0.160)	(0.183)	(0.309)	(0.529)	(0.070)	
MaxT	-0.096	0.108	-0.685	-0.141	0.167	0.075	-0.095	0.101	-0.669	-0.165	0.167	0.076
	(0.163)	(0.185)	(0.305)	(0.507)	(0.070)		(0.157)	(0.192)	(0.305)	(0.515)	(0.070)	
MinT	-0.061	0.028	-0.674	-0.160	0.198	0.074	-0.087	0.064	-0.624	-0.267	0.209	0.077
	(0.156)	(0.244)	(0.324)	(0.519)	(0.071)		(0.157)	(0.238)	(0.314)	(0.470)	(0.072)	
Drought	-0.177	0.068	-0.714	0.017	0.195	0.078	-0.161	0.021	-0.711	-0.067	0.192	0.081
	(0.159)	(0.197)	(0.313)	(0.587)	(0.071)		(0.132)	(0.210)	(0.302)	(0.554)	(0.071)	
Prec	-0.036	0.047	-0.683	-0.134	0.183	0.073	-0.073	0.036	-0.672	-0.141	0.192	0.072
	(0.158)	(0.232)	(0.327)	(0.519)	(0.070)		(0.137)	(0.248)	(0.329)	(0.518)	(0.070)	
Wind	-0.061	0.016	-0.816	-0.124	0.177	0.076	-0.068	0.046	-0.800	-0.055	0.179	0.075
	(0.156)	(0.215)	(0.350)	(0.516)	(0.067)		(0.145)	(0.211)	(0.356)	(0.576)	(0.069)	
Fire	-0.142	0.103	-0.685	-0.101	0.170	0.076	-0.166	0.110	-0.657	-0.135	0.171	0.076
	(0.182)	(0.166)	(0.290)	(0.489)	(0.070)		(0.189)	(0.164)	(0.288)	(0.486)	(0.070)	
Hail	-0.059	0.079	-0.662	-0.067	0.166	0.079	-0.083	0.062	-0.690	-0.071	0.169	0.082
	(0.133)	(0.209)	(0.312)	(0.524)	(0.069)		(0.137)	(0.201)	(0.300)	(0.539)	(0.069)	

Panel L: real wage wedge (growth rate)

	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	-0.036 (0.073)	0.013 (0.070)	-0.211 (0.095)	0.101 (0.306)	0.085 (0.083)	0.019	-0.029 (0.070)	0.005 (0.075)	-0.209 (0.095)	0.109 (0.283)	0.084 (0.082)	0.021
MaxT	-0.035 (0.072)	0.008 (0.072)	-0.214 (0.092)	0.108 (0.301)	0.085 (0.083)	0.020	-0.033 (0.072)	0.006 (0.074)	-0.219 (0.090)	0.117 (0.292)	0.085 (0.083)	0.020
MinT	-0.007 (0.077)	-0.038 (0.080)	-0.245 (0.087)	0.114 (0.301)	0.087 (0.083)	0.022	-0.004 (0.081)	-0.031 (0.082)	-0.244 (0.091)	0.196 (0.288)	0.085 (0.083)	0.022
Drought	-0.031 (0.070)	0.016 (0.067)	-0.208 (0.096)	0.086 (0.311)	0.084 (0.083)	0.019	-0.024 (0.072)	0.022 (0.070)	-0.207 (0.097)	0.090 (0.298)	0.083 (0.084)	0.020
Prec	-0.041 (0.075)	0.019 (0.066)	-0.212 (0.093)	0.100 (0.317)	0.085 (0.083)	0.019	-0.048 (0.076)	0.013 (0.068)	-0.206 (0.094)	0.104 (0.308)	0.085 (0.083)	0.019

Wind	-0.041	0.020	-0.207	0.101	0.085	0.019	-0.039	0.017	-0.172*	0.082	0.082	0.022
	(0.074)	(0.069)	(0.105)	(0.312)	(0.083)		(0.067)	(0.074)	(0.104)	(0.264)	(0.082)	
Fire	-0.034	0.014	-0.213	0.101	0.085	0.019	-0.029	0.011	-0.216	0.105	0.085	0.019
	(0.072)	(0.068)	(0.093)	(0.311)	(0.083)		(0.073)	(0.070)	(0.090)	(0.306)	(0.083)	
Hail	-0.041	0.016	-0.215	0.098	0.086	0.019	-0.039	0.017	-0.213	0.098	0.085	0.019
	(0.074)	(0.068)	(0.092)	(0.315)	(0.084)		(0.074)	(0.069)	(0.094)	(0.308)	(0.083)	

Panel M: labor share (change)

Melly-Pons FE							Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	0.320*	0.014	-0.103	1.131*	-0.066	0.028	0.326*	0.007	-0.101	1.162	-0.066	0.029
	(0.184)	(0.128)	(0.253)	(0.585)	(0.046)		(0.183)	(0.134)	(0.245)	(0.541)	(0.046)	
MaxT	0.318	-0.007	-0.130	1.179	-0.067	0.029	0.314	0.005	-0.147	1.206	-0.067	0.028
	(0.193)	(0.126)	(0.243)	(0.568)	(0.045)		(0.191)	(0.133)	(0.239)	(0.556)	(0.046)	
MinT	0.356*	-0.060	-0.189	1.180*	-0.063	0.023	0.387*	-0.074	-0.211	1.430	-0.064	0.027
	(0.192)	(0.145)	(0.277)	(0.613)	(0.047)		(0.203)	(0.146)	(0.253)	(0.548)	(0.047)	
Drought	0.210	0.090	-0.128	1.216*	-0.066	0.021	0.258	0.070	-0.112	1.130*	-0.065	0.019
	(0.203)	(0.162)	(0.233)	(0.696)	(0.047)		(0.201)	(0.152)	(0.240)	(0.663)	(0.047)	
Prec	0.211	0.054	-0.102	1.118*	-0.070	0.028	0.212	0.018	-0.059	1.171	-0.069	0.032
	(0.233)	(0.142)	(0.228)	(0.640)	(0.044)		(0.234)	(0.130)	(0.220)	(0.592)	(0.044)	
Wind	0.273	0.087	-0.037	1.135*	-0.065	0.022	0.275	0.068	-0.016	1.081*	-0.065	0.024
	(0.193)	(0.157)	(0.294)	(0.586)	(0.046)		(0.182)	(0.156)	(0.273)	(0.555)	(0.047)	
Fire	0.343	0.017	-0.123	1.127*	-0.064	0.025	0.366	0.007	-0.148	1.154*	-0.064	0.025
	(0.165)	(0.113)	(0.252)	(0.604)	(0.046)		(0.161)	(0.112)	(0.248)	(0.592)	(0.046)	
Hail	0.268	0.055	-0.124	1.109*	-0.065	0.021	0.273	0.066	-0.111	1.115*	-0.064	0.019
	(0.177)	(0.149)	(0.241)	(0.641)	(0.047)		(0.182)	(0.155)	(0.238)	(0.638)	(0.047)	

Panel N: unemployment rate (change)

Melly-Pons FE							Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	-0.032	0.078	0.020	1.277	0.483	0.351	-0.038	0.084*	0.019	1.267	0.477	0.353
	(0.082)	(0.048)	(0.082)	(0.159)	(0.048)		(0.082)	(0.047)	(0.081)	(0.164)	(0.048)	
MaxT	-0.030	0.081*	0.024	1.269	0.483	0.350	-0.032	0.082*	0.030	1.260	0.481	0.351
	(0.081)	(0.049)	(0.084)	(0.157)	(0.048)		(0.080)	(0.048)	(0.085)	(0.157)	(0.047)	
MinT	-0.017	0.064	0.017	1.283	0.493	0.348	-0.049	0.105*	0.045	1.210	0.481	0.351
	(0.080)	(0.070)	(0.092)	(0.166)	(0.044)		(0.076)	(0.063)	(0.090)	(0.153)	(0.047)	
Drought	-0.053	0.075	0.012	1.321	0.480	0.352	-0.050	0.060	0.015	1.292	0.475	0.355
	(0.082)	(0.052)	(0.084)	(0.199)	(0.044)		(0.081)	(0.050)	(0.083)	(0.189)	(0.044)	
Prec	-0.016	0.068	0.019	1.283	0.492	0.348	-0.019	0.068	0.019	1.282	0.492	0.348
	(0.077)	(0.058)	(0.088)	(0.160)	(0.043)		(0.076)	(0.061)	(0.088)	(0.165)	(0.043)	
Wind	-0.023	0.061	-0.008	1.274	0.480	0.351	-0.026	0.069	-0.017	1.295	0.473	0.354
	(0.079)	(0.055)	(0.079)	(0.171)	(0.050)		(0.079)	(0.050)	(0.082)	(0.186)	(0.048)	
Fire	-0.036	0.078	0.023	1.279	0.485	0.349	-0.045	0.082*	0.030	1.271	0.483	0.350
	(0.084)	(0.052)	(0.083)	(0.163)	(0.048)		(0.086)	(0.050)	(0.084)	(0.161)	(0.048)	
Hail	-0.019	0.073	0.027	1.285	0.487	0.351	-0.026	0.070	0.024	1.284	0.480	0.354
	(0.074)	(0.051)	(0.088)	(0.156)	(0.044)		(0.075)	(0.047)	(0.084)	(0.161)	(0.045)	

Panel O: labor force (growth rate)

Melly-Pons FE							Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	0.079	-0.029	-0.046	-0.459	0.320	0.116	0.075	-0.026	-0.046	-0.458	0.321	0.116
	(0.093)	(0.054)	(0.111)	(0.454)	(0.054)		(0.096)	(0.059)	(0.113)	(0.453)	(0.054)	
MaxT	0.078	-0.031	-0.048	-0.454	0.320	0.116	0.075	-0.027	-0.049	-0.455	0.321	0.116
	(0.092)	(0.054)	(0.112)	(0.454)	(0.054)		(0.096)	(0.059)	(0.114)	(0.452)	(0.054)	
MinT	0.089	-0.046	-0.055	-0.457	0.300	0.103	0.063	-0.010	-0.038	-0.482	0.321	0.116
	(0.099)	(0.056)	(0.119)	(0.446)	(0.055)		(0.106)	(0.067)	(0.130)	(0.486)	(0.053)	
Drought	0.091	-0.024	-0.035	-0.488	0.300	0.104	0.071	-0.019	-0.040	-0.463	0.301	0.103
	(0.097)	(0.058)	(0.113)	(0.443)	(0.055)		(0.101)	(0.067)	(0.114)	(0.435)	(0.055)	
Prec	0.070	-0.023	-0.046	-0.460	0.321	0.115	0.071	-0.024	-0.045	-0.459	0.321	0.115
	(0.103)	(0.063)	(0.114)	(0.447)	(0.053)		(0.104)	(0.064)	(0.116)	(0.445)	(0.054)	
Wind	0.073	-0.018	-0.036	-0.463	0.301	0.103	0.072	-0.022	-0.058	-0.454	0.321	0.116
	(0.100)	(0.067)	(0.115)	(0.448)	(0.055)		(0.100)	(0.069)	(0.110)	(0.424)	(0.053)	
Fire	0.097	-0.035	-0.045	-0.462	0.298	0.105	0.106	-0.038	-0.053	-0.452	0.297	0.106
	(0.083)	(0.042)	(0.110)	(0.459)	(0.055)		(0.081)	(0.041)	(0.112)	(0.462)	(0.055)	
Hail	0.073	-0.016	-0.037	-0.461	0.301	0.103	0.071	-0.018	-0.039	-0.461	0.301	0.103
	(0.100)	(0.071)	(0.117)	(0.441)	(0.055)		(0.100)	(0.070)	(0.116)	(0.436)	(0.055)	

Panel P: entry margin (excess labor force growth over employment growth)

Melly-Pons FE							Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	-0.032	0.090	0.026	1.433	0.479	0.340	-0.039	0.096*	0.025	1.422	0.474	0.343
	(0.089)	(0.055)	(0.094)	(0.170)	(0.047)		(0.090)	(0.053)	(0.093)	(0.175)	(0.047)	
MaxT	-0.030	0.094*	0.032	1.424	0.480	0.340	-0.032	0.094*	0.038	1.413	0.478	0.341
	(0.089)	(0.056)	(0.096)	(0.168)	(0.047)		(0.088)	(0.055)	(0.097)	(0.167)	(0.047)	
MinT	-0.015	0.073	0.023	1.440	0.489	0.338	-0.052	0.121*	0.055	1.356	0.478	0.341
	(0.087)	(0.079)	(0.106)	(0.179)	(0.044)		(0.083)	(0.072)	(0.104)	(0.162)	(0.047)	
Drought	-0.055	0.086	0.017	1.483	0.476	0.342	-0.053	0.070	0.021	1.450	0.472	0.345
	(0.090)	(0.059)	(0.096)	(0.215)	(0.044)		(0.088)	(0.057)	(0.095)	(0.203)	(0.043)	
Prec	-0.013	0.079	0.026	1.439	0.488	0.338	-0.017	0.078	0.026	1.438	0.488	0.338
	(0.083)	(0.066)	(0.101)	(0.172)	(0.043)		(0.082)	(0.069)	(0.101)	(0.178)	(0.043)	
Wind	-0.022	0.070	-0.006	1.429	0.476	0.341	-0.025	0.079	-0.016	1.454	0.470	0.344
	(0.086)	(0.063)	(0.090)	(0.184)	(0.049)		(0.085)	(0.057)	(0.093)	(0.199)	(0.047)	
Fire	-0.036	0.089	0.031	1.435	0.482	0.339	-0.047	0.094*	0.039	1.426	0.480	0.340
	(0.092)	(0.059)	(0.096)	(0.175)	(0.047)		(0.094)	(0.057)	(0.097)	(0.172)	(0.047)	
Hail	-0.017	0.084	0.035	1.442	0.484	0.341	-0.025	0.081	0.031	1.441	0.477	0.344
	(0.080)	(0.058)	(0.101)	(0.166)	(0.044)		(0.081)	(0.053)	(0.096)	(0.171)	(0.045)	

The table reports estimates from symmetric dynamic panel regressions for the annual growth rates of real GDP, of its private consumption and investment components, of persons employed, and of hours worked per person. The specifications include the Autometrics-selected country fixed-effects estimator (GTS-FE) and controls for economic uncertainty (DWUIE), geopolitical risk (GPR), financial stress (NCISS), and business cycle conditions (REC). The table also reports the estimated first-order autoregressive coefficient (lag1) and the coefficient of determination (R2). The conditioning variable is climate change risk (MED), computed from the E3CI composite index and from each of its components - extreme maximum and minimum temperature (MaxT, MinT), drought (Drought), extreme precipitation and wind (Prec, Wind), wildfires (Fire), and hail (Hail). The left-hand columns report the estimates obtained with the Melly-Pons fixed effects estimator; the right-hand columns those obtained with the per-country GETS estimator. Bold figures denote statistical significance at the 10% level or better; those marked with an asterisk are significant at the 10% but not at the 5% level.

Table A5-C: Dynamic panel regressions with country fixed effects and macro-financial controls: climate change relative risk (MED/IQR) impact (Melly-Pons FE and per-country GETS estimators)

Panel A: real GDP growth rate												
	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	-0.439 (0.372)	-0.218* (0.116)	-0.395* (0.230)	-4.185 (1.285)	0.281 (0.104)	0.330	-0.446 (0.370)	-0.191 (0.125)	-0.403* (0.229)	-4.275 (1.240)	0.278 (0.105)	0.333
MaxT	-0.440 (0.364)	-0.187* (0.113)	-0.354 (0.236)	-4.255 (1.299)	0.282 (0.105)	0.326	-0.443 (0.361)	-0.178 (0.119)	-0.337 (0.237)	-4.266 (1.284)	0.274 (0.105)	0.328
MinT	-0.486 (0.359)	-0.144 (0.164)	-0.329 (0.251)	-4.284 (1.374)	0.313 (0.104)	0.325	-0.560 (0.376)	-0.051 (0.184)	-0.238 (0.306)	-4.631 (1.429)	0.296 (0.098)	0.333
Drought	-0.468 (0.342)	-0.268* (0.146)	-0.393* (0.234)	-4.197 (1.310)	0.321 (0.107)	0.325	-0.504 (0.343)	-0.305 (0.154)	-0.404* (0.226)	-4.205 (1.268)	0.330 (0.104)	0.331
Prec	-0.330 (0.380)	-0.236 (0.104)	-0.414* (0.245)	-4.146 (1.382)	0.265 (0.103)	0.322	-0.357 (0.367)	-0.231 (0.111)	-0.434* (0.247)	-4.193 (1.363)	0.276 (0.108)	0.320
Wind	-0.410 (0.383)	-0.307 (0.116)	-0.555 (0.246)	-4.317 (1.229)	0.314 (0.105)	0.334	-0.405 (0.345)	-0.255* (0.135)	-0.610 (0.240)	-4.104 (1.123)	0.299 (0.102)	0.337
Fire	-0.438 (0.356)	-0.248 (0.122)	-0.347 (0.244)	-4.235 (1.298)	0.277 (0.104)	0.328	-0.524 (0.357)	-0.261* (0.146)	-0.294 (0.229)	-4.422 (1.277)	0.310 (0.107)	0.331
Hail	-0.397 (0.344)	-0.227 (0.139)	-0.351 (0.225)	-4.151 (1.362)	0.303 (0.103)	0.334	-0.419 (0.344)	-0.247 (0.153)	-0.378* (0.225)	-4.175 (1.309)	0.309 (0.102)	0.335
Panel B: real consumption growth rate												
	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	-0.236 (0.363)	0.071 (0.138)	-0.344 (0.298)	-4.017 (1.350)	0.248 (0.095)	0.250	-0.242 (0.364)	0.096 (0.143)	-0.348 (0.305)	-4.136 (1.327)	0.248 (0.097)	0.250
MaxT	-0.241 (0.365)	0.129 (0.123)	-0.289 (0.308)	-4.100 (1.357)	0.242 (0.096)	0.247	-0.248 (0.363)	0.119 (0.133)	-0.263 (0.310)	-4.136 (1.356)	0.244 (0.098)	0.247
MinT	-0.214 (0.355)	0.054 (0.165)	-0.323 (0.317)	-4.076 (1.464)	0.271 (0.097)	0.238	-0.329 (0.402)	0.203 (0.206)	-0.191 (0.384)	-4.449 (1.537)	0.269 (0.094)	0.247
Drought	-0.213 (0.353)	0.015 (0.127)	-0.345 (0.304)	-4.042 (1.407)	0.273 (0.099)	0.239	-0.255 (0.349)	-0.010 (0.127)	-0.366 (0.293)	-4.011 (1.351)	0.275 (0.099)	0.242
Prec	-0.082 (0.379)	0.050 (0.084)	-0.365 (0.306)	-3.968 (1.452)	0.227 (0.096)	0.244	-0.146 (0.365)	0.048 (0.101)	-0.376 (0.294)	-4.062 (1.437)	0.255 (0.100)	0.240
Wind	-0.177 (0.364)	-0.019 (0.127)	-0.515 (0.321)	-4.120 (1.326)	0.266 (0.096)	0.246	-0.189 (0.339)	0.025 (0.133)	-0.543* (0.292)	-3.964 (1.203)	0.267 (0.097)	0.251
Fire	-0.241 (0.352)	0.029 (0.131)	-0.271 (0.305)	-4.109 (1.357)	0.252 (0.096)	0.248	-0.302 (0.347)	0.026 (0.140)	-0.251 (0.307)	-4.242 (1.380)	0.263 (0.099)	0.245
Hail	-0.140 (0.333)	0.087 (0.148)	-0.323 (0.285)	-3.859 (1.452)	0.237 (0.095)	0.255	-0.183 (0.333)	0.054 (0.156)	-0.347 (0.280)	-3.934 (1.360)	0.255 (0.096)	0.255
Panel C: real investment growth rate												
	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	0.444 (0.502)	-0.678* (0.363)	-1.520 (0.466)	-8.372 (1.086)	0.253 (0.065)	0.201	0.467 (0.484)	-0.688* (0.378)	-1.519 (0.455)	-8.451 (1.055)	0.256 (0.066)	0.200
MaxT	0.420 (0.510)	-0.606 (0.378)	-1.444 (0.488)	-8.483 (1.072)	0.254 (0.064)	0.202	0.436 (0.492)	-0.642* (0.389)	-1.442 (0.487)	-8.494 (1.052)	0.255 (0.065)	0.201
MinT	0.471 (0.500)	-0.669 (0.501)	-1.501 (0.481)	-8.418 (1.073)	0.256 (0.065)	0.199	0.340 (0.502)	-0.511 (0.480)	-1.349 (0.610)	-8.847 (0.998)	0.259 (0.065)	0.201
Drought	0.575 (0.485)	-0.739* (0.388)	-1.498 (0.431)	-8.507 (1.151)	0.253 (0.063)	0.200	0.516 (0.454)	-0.718* (0.379)	-1.521 (0.436)	-8.407 (1.100)	0.255 (0.065)	0.199
Prec	0.618 (0.541)	-0.695 (0.334)	-1.533 (0.430)	-8.305 (1.157)	0.245 (0.060)	0.202	0.545 (0.490)	-0.689* (0.361)	-1.560 (0.437)	-8.412 (1.091)	0.253 (0.063)	0.200
Wind	0.505 (0.470)	-0.741* (0.379)	-1.613 (0.471)	-8.431 (1.040)	0.256 (0.066)	0.200	0.500 (0.469)	-0.722* (0.381)	-1.536 (0.445)	-8.392 (1.065)	0.256 (0.066)	0.199
Fire	0.437 (0.484)	-0.715 (0.361)	-1.444 (0.507)	-8.463 (1.032)	0.254 (0.066)	0.201	0.485 (0.465)	-0.722* (0.381)	-1.514 (0.496)	-8.420 (1.028)	0.256 (0.066)	0.199
Hail	0.536 (0.460)	-0.649* (0.379)	-1.480 (0.462)	-8.190 (1.195)	0.251 (0.066)	0.204	0.500 (0.453)	-0.693* (0.382)	-1.528 (0.463)	-8.287 (1.134)	0.254 (0.066)	0.201
Panel D: employed persons (growth rate)												
	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	0.107 (0.140)	-0.107 (0.080)	-0.065 (0.186)	-1.972 (0.548)	0.457 (0.054)	0.298	0.107 (0.139)	-0.112 (0.085)	-0.066 (0.188)	-1.937 (0.564)	0.456 (0.053)	0.298
MaxT	0.109 (0.139)	-0.122 (0.085)	-0.082 (0.191)	-1.945 (0.554)	0.458 (0.053)	0.298	0.109 (0.139)	-0.118 (0.088)	-0.087 (0.195)	-1.938 (0.557)	0.459 (0.052)	0.297
MinT	0.093 (0.150)	-0.105 (0.102)	-0.066 (0.199)	-1.966 (0.537)	0.463 (0.051)	0.296	0.119 (0.155)	-0.136 (0.099)	-0.096 (0.210)	-1.883 (0.586)	0.460 (0.052)	0.297
Drought	0.145 (0.146)	-0.107 (0.085)	-0.040 (0.189)	-2.053 (0.583)	0.454 (0.051)	0.301	0.124 (0.154)	-0.083 (0.093)	-0.049 (0.185)	-1.994 (0.571)	0.456 (0.049)	0.300
Prec	0.086 (0.145)	-0.096 (0.107)	-0.062 (0.192)	-1.971 (0.536)	0.464 (0.050)	0.296	0.090 (0.147)	-0.094 (0.110)	-0.063 (0.197)	-1.971 (0.530)	0.464 (0.051)	0.296
Wind	0.086 (0.141)	-0.085 (0.100)	-0.013 (0.182)	-1.947 (0.564)	0.458 (0.055)	0.298	0.090 (0.147)	-0.097 (0.093)	-0.018 (0.183)	-1.985 (0.569)	0.456 (0.052)	0.297
Fire	0.107 (0.140)	-0.096 (0.087)	-0.085 (0.190)	-1.947 (0.547)	0.458 (0.053)	0.299	0.149 (0.141)	-0.098 (0.076)	-0.111 (0.193)	-1.867 (0.581)	0.452 (0.052)	0.302
Hail	0.086 (0.144)	-0.103 (0.099)	-0.067 (0.195)	-1.988 (0.528)	0.463 (0.051)	0.297	0.090 (0.147)	-0.102 (0.092)	-0.062 (0.190)	-1.991 (0.540)	0.460 (0.051)	0.298
Panel E: hours worked per employed person (growth rate)												
	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	0.074 (0.179)	-0.102 (0.095)	0.165 (0.239)	-1.731 (1.145)	-0.225* (0.123)	0.138	0.065 (0.184)	-0.092 (0.111)	0.163 (0.233)	-1.733 (1.121)	-0.222* (0.122)	0.137
MaxT	0.067 (0.180)	-0.094 (0.106)	0.165 (0.237)	-1.728 (1.124)	-0.223* (0.123)	0.137	0.063 (0.184)	-0.088 (0.110)	0.171 (0.239)	-1.736 (1.120)	-0.223* (0.124)	0.137
MinT	0.068 (0.186)	-0.094 (0.111)	0.166 (0.244)	-1.731 (1.144)	-0.223* (0.123)	0.138	0.040 (0.192)	-0.061 (0.125)	0.189 (0.265)	-1.799 (1.199)	-0.215* (0.116)	0.139
Drought	0.050 (0.158)	-0.093 (0.109)	0.155 (0.238)	-1.698 (1.109)	-0.219* (0.121)	0.139	0.041 (0.165)	-0.106 (0.114)	0.150 (0.234)	-1.703 (1.093)	-0.212* (0.116)	0.142
Prec	0.055 (0.189)	-0.104 (0.093)	0.164 (0.241)	-1.736 (1.145)	-0.219* (0.120)	0.139	0.061 (0.191)	-0.105 (0.097)	0.170 (0.238)	-1.725 (1.150)	-0.221* (0.123)	0.138
Wind	0.070 (0.193)	-0.099 (0.105)	0.160 (0.240)	-1.731 (1.147)	-0.223* (0.122)	0.138	0.067 (0.189)	-0.094 (0.120)	0.104 (0.224)	-1.697 (1.040)	-0.211* (0.116)	0.143

Fire	0.072	-0.099	0.162	-1.728	-0.224*	0.138	0.071	-0.098	0.164	-1.729	-0.224*	0.138
	(0.178)	(0.097)	(0.241)	(1.147)	(0.124)		(0.167)	(0.101)	(0.245)	(1.164)	(0.123)	
Hail	0.073	-0.092	0.167	-1.715	-0.223*	0.138	0.069	-0.092	0.162	-1.711	-0.220*	0.140
	(0.192)	(0.111)	(0.237)	(1.138)	(0.124)		(0.190)	(0.115)	(0.235)	(1.119)	(0.123)	

Panel F: labor productivity - output per worker (growth rate)

	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	-0.496*	-0.079	-0.350	-2.287	0.117	0.224	-0.512*	-0.039	-0.347	-2.481	0.122	0.232
	(0.275)	(0.114)	(0.167)	(0.928)	(0.077)		(0.272)	(0.128)	(0.149)	(0.814)	(0.080)	
MaxT	-0.509*	-0.001	-0.260	-2.428	0.119	0.214	-0.521	-0.009	-0.220	-2.481	0.121	0.218
	(0.271)	(0.131)	(0.166)	(0.926)	(0.080)		(0.265)	(0.142)	(0.161)	(0.895)	(0.081)	
MinT	-0.550	0.024	-0.271	-2.373	0.184	0.181	-0.663	0.136	-0.117	-2.927	0.171	0.213
	(0.245)	(0.191)	(0.244)	(1.105)	(0.081)		(0.275)	(0.221)	(0.208)	(1.036)	(0.070)	
Drought	-0.541	-0.153	-0.381	-2.192	0.197	0.178	-0.565	-0.207	-0.390*	-2.229	0.202	0.195
	(0.249)	(0.205)	(0.233)	(1.025)	(0.080)		(0.239)	(0.197)	(0.217)	(0.984)	(0.074)	
Prec	-0.328	-0.130	-0.357	-2.275	0.120	0.189	-0.381	-0.117	-0.393	-2.335	0.150*	0.181
	(0.281)	(0.163)	(0.229)	(1.122)	(0.080)		(0.265)	(0.191)	(0.249)	(1.075)	(0.087)	
Wind	-0.419	-0.214	-0.632	-2.407	0.165	0.210	-0.441*	-0.145	-0.645	-2.177	0.170	0.227
	(0.269)	(0.147)	(0.219)	(0.903)	(0.079)		(0.231)	(0.153)	(0.191)	(0.743)	(0.076)	
Fire	-0.507*	-0.139	-0.240	-2.415	0.129*	0.217	-0.647	-0.134	-0.178	-2.673	0.141*	0.223
	(0.263)	(0.125)	(0.176)	(0.953)	(0.075)		(0.272)	(0.157)	(0.151)	(0.855)	(0.078)	
Hail	-0.406*	-0.101	-0.317	-2.168*	0.152	0.204	-0.435	-0.124	-0.359*	-2.188	0.157	0.210
	(0.214)	(0.176)	(0.232)	(1.116)	(0.076)		(0.211)	(0.185)	(0.214)	(1.039)	(0.074)	

Panel G: labor productivity - output per hour worked (growth rate)

	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	-0.391	-0.034	-0.406	-0.727	0.112	0.148	-0.395	-0.007	-0.404	-0.899	0.117	0.146
	(0.097)	(0.084)	(0.165)	(0.630)	(0.053)		(0.106)	(0.100)	(0.158)	(0.655)	(0.054)	
MaxT	-0.404	0.021	-0.322*	-0.865	0.122	0.134	-0.409	0.010	-0.286	-0.908	0.124	0.135
	(0.109)	(0.121)	(0.175)	(0.666)	(0.054)		(0.114)	(0.132)	(0.177)	(0.663)	(0.054)	
MinT	-0.403	0.012	-0.301	-0.854	0.179	0.098	-0.467	0.065	-0.226	-1.191*	0.165	0.112
	(0.165)	(0.200)	(0.204)	(0.652)	(0.062)		(0.169)	(0.213)	(0.174)	(0.672)	(0.058)	
Drought	-0.357*	-0.132	-0.368*	-0.775	0.185	0.093	-0.378*	-0.150	-0.380*	-0.770	0.185	0.098
	(0.216)	(0.217)	(0.204)	(0.653)	(0.060)		(0.226)	(0.196)	(0.196)	(0.664)	(0.059)	
Prec	-0.211	-0.097	-0.402	-0.713	0.114	0.123	-0.251*	-0.079	-0.443	-0.804	0.137	0.111
	(0.141)	(0.158)	(0.199)	(0.672)	(0.058)		(0.152)	(0.190)	(0.211)	(0.641)	(0.063)	
Wind	-0.313	-0.164	-0.591	-0.870	0.161	0.119	-0.318*	-0.113	-0.570	-0.709	0.162	0.120
	(0.136)	(0.160)	(0.178)	(0.703)	(0.057)		(0.167)	(0.156)	(0.170)	(0.672)	(0.058)	
Fire	-0.403	-0.097	-0.297*	-0.856	0.129	0.136	-0.515	-0.087	-0.242	-1.080	0.133	0.140
	(0.109)	(0.115)	(0.176)	(0.653)	(0.053)		(0.117)	(0.127)	(0.174)	(0.662)	(0.054)	
Hail	-0.302	-0.085	-0.346*	-0.692	0.159	0.115	-0.323*	-0.103	-0.377*	-0.718	0.163	0.114
	(0.185)	(0.178)	(0.208)	(0.624)	(0.056)		(0.187)	(0.181)	(0.197)	(0.643)	(0.057)	

Panel H: real product wage (growth rate)

	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	-0.039	0.100	-0.603	0.058	0.019	0.054	-0.045	0.123	-0.600	-0.088	0.023	0.052
	(0.129)	(0.112)	(0.192)	(0.328)	(0.067)		(0.119)	(0.120)	(0.211)	(0.347)	(0.067)	
MaxT	-0.055	0.165	-0.528	-0.064	0.022	0.052	-0.063	0.155	-0.498	-0.103	0.023	0.051
	(0.122)	(0.127)	(0.207)	(0.340)	(0.066)		(0.112)	(0.133)	(0.213)	(0.352)	(0.067)	
MinT	-0.031	0.100	-0.491	-0.142	0.097	0.033	-0.141	0.248	-0.432	-0.418	0.038	0.044
	(0.125)	(0.188)	(0.242)	(0.431)	(0.074)		(0.114)	(0.179)	(0.207)	(0.362)	(0.063)	
Drought	-0.094	0.062	-0.549	0.014	0.105	0.039	-0.093	0.013	-0.555	-0.046	0.101	0.045
	(0.109)	(0.164)	(0.248)	(0.461)	(0.074)		(0.101)	(0.165)	(0.230)	(0.437)	(0.073)	
Prec	0.058	0.052	-0.524	-0.084	0.083	0.037	0.021	0.053	-0.533	-0.127	0.093	0.033
	(0.135)	(0.184)	(0.248)	(0.409)	(0.073)		(0.117)	(0.202)	(0.250)	(0.422)	(0.073)	
Wind	0.023	0.008	-0.682	-0.180	0.091	0.041	0.011	0.054	-0.753	0.028	0.068	0.048
	(0.114)	(0.178)	(0.273)	(0.344)	(0.072)		(0.106)	(0.148)	(0.248)	(0.389)	(0.071)	
Fire	-0.046	0.054	-0.511	-0.052	0.024	0.050	-0.136	0.061	-0.474	-0.231	0.027	0.049
	(0.116)	(0.131)	(0.208)	(0.368)	(0.067)		(0.127)	(0.131)	(0.213)	(0.364)	(0.068)	
Hail	0.026	0.100	-0.521	0.092	0.056	0.051	0.003	0.080	-0.560	0.066	0.059	0.054
	(0.104)	(0.156)	(0.230)	(0.455)	(0.072)		(0.105)	(0.148)	(0.216)	(0.435)	(0.071)	

Panel I: real consumption wage (growth rate)

	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	-0.096	0.078	-0.702	-0.082	0.165	0.078	-0.092	0.082	-0.698	-0.163	0.171	0.074
	(0.167)	(0.179)	(0.299)	(0.518)	(0.070)		(0.154)	(0.201)	(0.315)	(0.526)	(0.070)	
MaxT	-0.100	0.108	-0.659	-0.156	0.169	0.075	-0.100	0.096	-0.648	-0.170	0.171	0.074
	(0.157)	(0.202)	(0.306)	(0.515)	(0.069)		(0.149)	(0.211)	(0.309)	(0.521)	(0.070)	
MinT	-0.040	-0.019	-0.664	-0.198	0.211	0.077	-0.156	0.168	-0.598	-0.373	0.175	0.074
	(0.162)	(0.236)	(0.319)	(0.516)	(0.072)		(0.162)	(0.201)	(0.275)	(0.424)	(0.067)	
Drought	-0.163	0.064	-0.720	0.016	0.194	0.076	-0.149	0.017	-0.720	-0.056	0.193	0.080
	(0.155)	(0.204)	(0.324)	(0.592)	(0.071)		(0.134)	(0.216)	(0.309)	(0.562)	(0.071)	
Prec	-0.034	0.047	-0.681	-0.124	0.183	0.073	-0.073	0.037	-0.672	-0.141	0.192	0.072
	(0.158)	(0.234)	(0.328)	(0.520)	(0.069)		(0.138)	(0.248)	(0.328)	(0.518)	(0.070)	
Wind	-0.044	0.012	-0.846	-0.163	0.177	0.076	-0.057	0.047	-0.824	-0.056	0.179	0.076
	(0.155)	(0.217)	(0.363)	(0.492)	(0.067)		(0.144)	(0.207)	(0.361)	(0.576)	(0.069)	
Fire	-0.105	0.051	-0.636	-0.156	0.165	0.079	-0.151	0.053	-0.624	-0.253	0.171	0.075
	(0.160)	(0.193)	(0.297)	(0.511)	(0.069)		(0.163)	(0.201)	(0.298)	(0.512)	(0.070)	
Hail	-0.043	0.084	-0.674	0.005	0.166	0.079	-0.061	0.068	-0.704	-0.016	0.169	0.081
	(0.132)	(0.212)	(0.313)	(0.533)	(0.069)		(0.137)	(0.205)	(0.306)	(0.550)	(0.069)	

Panel L: real wage wedge (growth rate)

	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	-0.036 (0.072)	0.014 (0.071)	-0.212 (0.094)	0.099 (0.304)	0.085 (0.083)	0.019	-0.029 (0.070)	0.004 (0.076)	-0.212 (0.091)	0.125 (0.273)	0.084 (0.082)	0.022
MaxT	-0.031 (0.071)	0.002 (0.073)	-0.222 (0.089)	0.116 (0.293)	0.085 (0.083)	0.020	-0.027 (0.071)	-0.001 (0.074)	-0.231 (0.087)	0.128 (0.282)	0.085 (0.083)	0.022
MinT	-0.005 (0.074)	-0.052 (0.084)	-0.243 (0.087)	0.126 (0.301)	0.086 (0.082)	0.022	-0.019 (0.082)	-0.011 (0.078)	-0.235 (0.088)	0.164 (0.299)	0.085 (0.083)	0.020
Drought	-0.031 (0.071)	0.016 (0.067)	-0.207 (0.095)	0.084 (0.310)	0.084 (0.083)	0.019	-0.022 (0.072)	0.024 (0.071)	-0.204 (0.098)	0.085 (0.295)	0.083 (0.084)	0.021
Prec	-0.040 (0.075)	0.019 (0.066)	-0.212 (0.093)	0.101 (0.318)	0.085 (0.084)	0.019	-0.049 (0.076)	0.014 (0.068)	-0.206 (0.093)	0.105 (0.308)	0.085 (0.083)	0.019

Wind	-0.041 (0.076)	0.019 (0.069)	-0.211* (0.109)	0.101 (0.317)	0.085 (0.083)	0.019	-0.043 (0.068)	0.017 (0.074)	-0.166 (0.108)	0.084 (0.265)	0.082 (0.082)	0.022
Fire	-0.037 (0.073)	0.018 (0.068)	-0.216 (0.090)	0.105 (0.310)	0.085 (0.083)	0.019	-0.015 (0.072)	0.016 (0.075)	-0.233 (0.085)	0.144 (0.279)	0.084 (0.082)	0.021
Hail	-0.042 (0.073)	0.016 (0.068)	-0.213 (0.093)	0.095 (0.316)	0.086 (0.083)	0.019	-0.041 (0.073)	0.016 (0.069)	-0.211 (0.094)	0.091 (0.308)	0.085 (0.083)	0.019

Panel M: labor share (change)

	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	0.305 (0.186)	0.039 (0.138)	-0.110 (0.245)	1.118* (0.594)	-0.066 (0.046)	0.026	0.316* (0.189)	0.018 (0.142)	-0.113 (0.235)	1.216 (0.523)	-0.066 (0.046)	0.029
MaxT	0.308* (0.185)	0.015 (0.130)	-0.146 (0.233)	1.180 (0.571)	-0.067 (0.046)	0.024	0.317* (0.186)	0.015 (0.136)	-0.167 (0.231)	1.215 (0.547)	-0.068 (0.046)	0.025
MinT	0.340* (0.185)	-0.062 (0.151)	-0.169 (0.273)	1.187* (0.629)	-0.063 (0.047)	0.022	0.359* (0.190)	-0.042 (0.128)	-0.206 (0.259)	1.386 (0.577)	-0.063 (0.047)	0.023
Drought	0.213 (0.204)	0.089 (0.161)	-0.134 (0.235)	1.224* (0.690)	-0.066 (0.047)	0.021	0.256 (0.198)	0.068 (0.152)	-0.114 (0.241)	1.135* (0.667)	-0.065 (0.047)	0.019
Prec	0.212 (0.228)	0.056 (0.144)	-0.107 (0.229)	1.097* (0.650)	-0.069 (0.045)	0.026	0.213 (0.232)	0.034 (0.135)	-0.066 (0.222)	1.167* (0.597)	-0.070 (0.044)	0.028
Wind	0.262 (0.201)	0.091 (0.158)	-0.013 (0.309)	1.161 (0.578)	-0.064 (0.046)	0.022	0.267 (0.185)	0.068 (0.155)	-0.006 (0.283)	1.088* (0.558)	-0.064 (0.047)	0.024
Fire	0.299* (0.177)	0.065 (0.144)	-0.145 (0.243)	1.158* (0.603)	-0.066 (0.047)	0.022	0.355 (0.170)	0.056 (0.149)	-0.179 (0.238)	1.261 (0.546)	-0.064 (0.047)	0.025
Hail	0.264 (0.179)	0.057 (0.148)	-0.117 (0.239)	1.090* (0.639)	-0.064 (0.047)	0.020	0.269 (0.181)	0.065 (0.154)	-0.108 (0.239)	1.104* (0.640)	-0.064 (0.047)	0.019

Panel N: unemployment rate (change)

	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	-0.031 (0.083)	0.074 (0.048)	0.021 (0.083)	1.281 (0.158)	0.483 (0.047)	0.351	-0.035 (0.081)	0.081* (0.047)	0.022 (0.083)	1.254 (0.164)	0.477 (0.047)	0.353
MaxT	-0.035 (0.083)	0.087* (0.048)	0.034 (0.086)	1.261 (0.157)	0.481 (0.047)	0.352	-0.037 (0.082)	0.086* (0.049)	0.040 (0.088)	1.253 (0.160)	0.480 (0.046)	0.353
MinT	-0.011 (0.079)	0.051 (0.074)	0.012 (0.091)	1.289 (0.165)	0.495 (0.044)	0.348	-0.048 (0.078)	0.105 (0.067)	0.050 (0.091)	1.202 (0.143)	0.483 (0.048)	0.351
Drought	-0.049 (0.081)	0.074 (0.053)	0.010 (0.086)	1.322 (0.202)	0.482 (0.044)	0.351	-0.048 (0.080)	0.058 (0.051)	0.011 (0.083)	1.297 (0.195)	0.475 (0.043)	0.355
Prec	-0.014 (0.076)	0.068 (0.058)	0.019 (0.088)	1.285 (0.158)	0.492 (0.043)	0.348	-0.019 (0.075)	0.068 (0.061)	0.019 (0.089)	1.282 (0.165)	0.492 (0.043)	0.348
Wind	-0.019 (0.079)	0.060 (0.057)	-0.015 (0.078)	1.265 (0.167)	0.480 (0.050)	0.351	-0.022 (0.079)	0.069 (0.050)	-0.023 (0.083)	1.293 (0.185)	0.473 (0.048)	0.354
Fire	-0.031 (0.082)	0.068 (0.051)	0.033 (0.086)	1.267 (0.158)	0.482 (0.047)	0.350	-0.058 (0.089)	0.069 (0.047)	0.050 (0.088)	1.218 (0.162)	0.474 (0.046)	0.354
Hail	-0.016 (0.074)	0.073 (0.052)	0.024 (0.087)	1.297 (0.157)	0.488 (0.044)	0.350	-0.021 (0.074)	0.072 (0.048)	0.020 (0.083)	1.298 (0.162)	0.481 (0.045)	0.354

Panel O: labor force (growth rate)

	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	0.079 (0.093)	-0.024 (0.054)	-0.040 (0.114)	-0.465 (0.452)	0.300 (0.055)	0.104	0.075 (0.097)	-0.025 (0.060)	-0.046 (0.113)	-0.455 (0.455)	0.321 (0.054)	0.116
MaxT	0.076 (0.095)	-0.028 (0.059)	-0.050 (0.114)	-0.455 (0.453)	0.321 (0.054)	0.116	0.075 (0.096)	-0.026 (0.060)	-0.050 (0.116)	-0.455 (0.454)	0.321 (0.054)	0.116
MinT	0.094 (0.098)	-0.060 (0.051)	-0.057 (0.117)	-0.449 (0.448)	0.298 (0.055)	0.104	0.073 (0.103)	-0.020 (0.062)	-0.040 (0.132)	-0.462 (0.492)	0.301 (0.055)	0.103
Drought	0.089 (0.097)	-0.023 (0.059)	-0.033 (0.114)	-0.490 (0.444)	0.300 (0.055)	0.103	0.073 (0.101)	-0.019 (0.066)	-0.040 (0.113)	-0.464 (0.436)	0.301 (0.055)	0.103
Prec	0.072 (0.106)	-0.023 (0.065)	-0.046 (0.114)	-0.460 (0.449)	0.321 (0.053)	0.115	0.072 (0.106)	-0.023 (0.065)	-0.046 (0.117)	-0.460 (0.444)	0.321 (0.054)	0.115
Wind	0.072 (0.101)	-0.017 (0.066)	-0.030 (0.114)	-0.460 (0.454)	0.301 (0.055)	0.103	0.073 (0.102)	-0.022 (0.067)	-0.053 (0.109)	-0.457 (0.431)	0.321 (0.053)	0.116
Fire	0.080 (0.092)	-0.020 (0.057)	-0.049 (0.115)	-0.456 (0.453)	0.301 (0.055)	0.104	0.094 (0.085)	-0.021 (0.054)	-0.056 (0.116)	-0.430 (0.470)	0.299 (0.055)	0.104
Hail	0.074 (0.101)	-0.018 (0.068)	-0.039 (0.117)	-0.460 (0.441)	0.301 (0.055)	0.103	0.073 (0.101)	-0.018 (0.068)	-0.040 (0.115)	-0.460 (0.437)	0.301 (0.055)	0.103

Panel P: entry margin (excess labor force growth over employment growth)

	Melly-Pons FE						Per-country GETS					
	DWUIE	GPR	NCISS	REC	lag1	R2	DWUIE	GPR	NCISS	REC	lag1	R2
E3CI	-0.031 (0.090)	0.086 (0.055)	0.028 (0.095)	1.437 (0.168)	0.479 (0.046)	0.341	-0.036 (0.088)	0.093* (0.054)	0.029 (0.095)	1.406 (0.173)	0.474 (0.046)	0.343
MaxT	-0.036 (0.091)	0.100* (0.055)	0.043 (0.099)	1.415 (0.167)	0.478 (0.046)	0.342	-0.038 (0.089)	0.099* (0.056)	0.049 (0.101)	1.405 (0.170)	0.477 (0.046)	0.342
MinT	-0.007 (0.085)	0.058 (0.084)	0.017 (0.105)	1.447 (0.178)	0.491 (0.043)	0.338	-0.050 (0.086)	0.119 (0.076)	0.060 (0.106)	1.349 (0.151)	0.480 (0.047)	0.340
Drought	-0.051 (0.089)	0.085 (0.060)	0.015 (0.098)	1.484 (0.217)	0.478 (0.043)	0.341	-0.050 (0.087)	0.067 (0.058)	0.016 (0.095)	1.456 (0.209)	0.472 (0.042)	0.345
Prec	-0.012 (0.082)	0.079 (0.065)	0.026 (0.101)	1.442 (0.171)	0.489 (0.043)	0.338	-0.017 (0.081)	0.079 (0.069)	0.025 (0.102)	1.438 (0.178)	0.488 (0.043)	0.338
Wind	-0.017 (0.086)	0.069 (0.064)	-0.014 (0.087)	1.418 (0.179)	0.477 (0.049)	0.341	-0.021 (0.086)	0.080 (0.057)	-0.023 (0.093)	1.452 (0.198)	0.470 (0.047)	0.344
Fire	-0.031 (0.090)	0.078 (0.058)	0.042 (0.099)	1.421 (0.169)	0.479 (0.046)	0.340	-0.061 (0.097)	0.080 (0.054)	0.060 (0.101)	1.366 (0.172)	0.472 (0.045)	0.344
Hail	-0.014 (0.080)	0.085 (0.059)	0.032 (0.100)	1.457 (0.168)	0.485 (0.044)	0.340	-0.019 (0.081)	0.083 (0.054)	0.026 (0.095)	1.457 (0.173)	0.477 (0.044)	0.344

The table reports estimates from symmetric dynamic panel regressions for the annual growth rates of real GDP, of its private consumption and investment components, of persons employed, and of hours worked per person. The specifications include the Autometrics-selected country fixed-effects estimator (GTS-FE) and controls for economic uncertainty (DWUIE), geopolitical risk (GPR), financial stress (NCISS), and business cycle conditions (REC). The table also reports the estimated first-order autoregressive coefficient (lag1) and the coefficient of determination (R2). The conditioning variable is climate change relative risk (MED/IQR), computed from the E3CI composite index and from each of its components - extreme maximum and minimum temperature (MaxT, MinT), drought (Drought), extreme precipitation and wind (Prec, Wind), wildfires (Fire), and hail (Hail). The left-hand columns report the estimates obtained with the Melly-Pons fixed effects estimator; the right-hand columns those obtained with the per-country GETS estimator. Bold figures denote statistical significance at the 10% level or better; those marked with an asterisk are significant at the 10% but not at the 5% level.

Table A6-A: Dynamic panel regressions with GETS-Autometrics country fixed effects and macro-fin control variables: Asymmetric models, climate uncertainty (IQR) (Melly-Pons FE measures)

Panel A: real GDP growth rate														
	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.197* (0.112)	-0.303 (0.137)	-0.838 (0.331)	-0.943 (0.372)	-0.252* (0.144)	-0.343* (0.183)	-0.036 (0.167)	-0.293 (0.138)	-0.269 (0.120)	-0.266 (0.163)	-0.294 (0.111)	-0.227 (0.189)	-0.182 (0.150)	-0.390 (0.136)
MaxT	-0.125 (0.093)	-0.116 (0.100)	-0.319 (0.251)	-0.363 (0.244)	-0.148 (0.090)	-0.062 (0.165)	-0.081 (0.131)	-0.143 (0.091)	-0.137 (0.089)	-0.137 (0.101)	-0.163* (0.087)	-0.096 (0.114)	-0.109 (0.095)	-0.185* (0.101)
MinT	0.146 (0.224)	-0.307 (0.289)	0.186 (0.428)	-0.246 (0.423)	0.062 (0.205)	-0.790 (0.367)	0.215 (0.292)	-0.104 (0.218)	-0.120 (0.239)	-0.001 (0.208)	0.034 (0.235)	-0.251 (0.233)	0.058 (0.190)	-0.284 (0.308)
Drought	-0.053 (0.462)	-0.110 (0.578)	0.528 (0.658)	0.779 (0.701)	-0.061 (0.553)	-0.510 (0.596)	-0.083 (0.467)	-0.136 (0.541)	-0.145 (0.494)	-0.109 (0.589)	-0.209 (0.472)	-0.005 (0.651)	-0.124 (0.543)	-0.142 (0.586)
Prec	-0.047 (0.041)	-0.052 (0.051)	-0.063 (0.130)	-0.064 (0.137)	-0.052 (0.050)	-0.089 (0.063)	-0.015 (0.056)	-0.063 (0.049)	-0.064 (0.043)	-0.048 (0.057)	-0.073* (0.040)	-0.034 (0.065)	-0.039 (0.051)	-0.084* (0.048)
Wind	-0.368 (0.164)	-0.515 (0.256)	-0.434 (0.327)	-0.317 (0.376)	-0.320 (0.246)	-1.009 (0.306)	-0.189 (0.191)	-0.449* (0.252)	-0.457 (0.196)	-0.374 (0.309)	-0.497 (0.176)	-0.314 (0.356)	-0.271 (0.251)	-0.596 (0.268)
Fire	-0.107 (0.095)	-0.107 (0.112)	-0.011 (0.264)	0.023 (0.282)	-0.103 (0.112)	-0.221 (0.141)	-0.077 (0.115)	-0.120 (0.111)	-0.141 (0.097)	-0.079 (0.127)	-0.173 (0.086)	-0.030 (0.148)	-0.071 (0.120)	-0.173* (0.101)
Hail	-0.517 (0.214)	-0.481 (0.329)	-0.555 (0.418)	-0.370 (0.480)	-0.411 (0.275)	-0.619* (0.372)	-0.322* (0.187)	-0.446 (0.298)	-0.401* (0.239)	-0.483 (0.349)	-0.491 (0.217)	-0.342 (0.412)	-0.372 (0.276)	-0.531* (0.306)

Panel B: real consumption growth rate														
	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.235 (0.153)	-0.405 (0.145)	-0.925 (0.447)	-1.012 (0.406)	-0.262* (0.157)	-0.536 (0.230)	-0.094 (0.208)	-0.333 (0.134)	-0.300 (0.139)	-0.325 (0.163)	-0.324 (0.130)	-0.287 (0.189)	-0.212 (0.184)	-0.450 (0.138)
MaxT	-0.179* (0.108)	-0.186* (0.098)	-0.484* (0.278)	-0.495* (0.259)	-0.161* (0.096)	-0.181 (0.186)	-0.077 (0.126)	-0.173* (0.089)	-0.157 (0.103)	-0.173* (0.098)	-0.185* (0.099)	-0.128 (0.107)	-0.138 (0.104)	-0.206* (0.110)
MinT	0.024 (0.216)	-0.631 (0.294)	0.002 (0.440)	-0.391 (0.449)	-0.110 (0.188)	-1.099 (0.473)	0.031 (0.264)	-0.291 (0.200)	-0.233 (0.225)	-0.303 (0.237)	-0.098 (0.221)	-0.528 (0.257)	-0.044 (0.193)	-0.610* (0.316)
Drought	0.210 (0.507)	0.240 (0.577)	0.755 (0.742)	1.011 (0.676)	0.162 (0.546)	0.066 (0.844)	0.300 (0.641)	0.132 (0.514)	0.181 (0.514)	0.096 (0.560)	0.170 (0.484)	0.111 (0.622)	0.170 (0.598)	0.112 (0.582)
Prec	-0.062 (0.053)	-0.084* (0.046)	-0.115 (0.149)	-0.119 (0.135)	-0.060 (0.052)	-0.140* (0.076)	-0.025 (0.069)	-0.077* (0.046)	-0.074 (0.051)	-0.067 (0.049)	-0.084* (0.047)	-0.051 (0.056)	-0.053 (0.060)	-0.097 (0.048)
Wind	-0.429 (0.276)	-0.394 (0.275)	-0.378 (0.434)	-0.329 (0.379)	-0.264 (0.280)	-1.187 (0.534)	-0.482 (0.390)	-0.390 (0.257)	-0.499* (0.259)	-0.248 (0.295)	-0.529 (0.231)	-0.204 (0.347)	-0.302 (0.353)	-0.510* (0.274)
Fire	-0.122 (0.127)	-0.088 (0.103)	-0.049 (0.312)	0.013 (0.284)	-0.076 (0.119)	-0.323 (0.199)	-0.027 (0.162)	-0.111 (0.111)	-0.126 (0.123)	-0.068 (0.108)	-0.157 (0.111)	-0.020 (0.129)	-0.068 (0.145)	-0.147 (0.111)
Hail	-0.609* (0.348)	-0.257 (0.313)	-0.450 (0.530)	-0.312 (0.449)	-0.327 (0.305)	-0.575 (0.520)	-0.594 (0.402)	-0.327 (0.287)	-0.389 (0.290)	-0.299 (0.337)	-0.478* (0.263)	-0.157 (0.397)	-0.386 (0.365)	-0.303 (0.269)

Panel C: real investment growth rate														
	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.255 (0.289)	-0.437 (0.309)	-0.801 (0.916)	-0.892 (0.894)	-0.011 (0.258)	-1.475 (0.576)	-0.458 (0.654)	-0.237 (0.233)	-0.371 (0.277)	-0.080 (0.259)	-0.338 (0.280)	-0.131 (0.299)	-0.014 (0.324)	-0.603 (0.376)
MaxT	-0.261 (0.193)	-0.279 (0.236)	-0.744 (0.464)	-0.721 (0.543)	-0.055 (0.156)	-1.000* (0.544)	-0.130 (0.494)	-0.174 (0.139)	-0.265 (0.169)	-0.022 (0.139)	-0.258 (0.176)	-0.026 (0.155)	-0.013 (0.192)	-0.432 (0.297)
MinT	0.571 (0.507)	-0.998 (0.800)	0.198 (0.909)	-1.158 (0.932)	-0.115 (0.489)	-1.522 (1.220)	2.169 (0.847)	-0.596 (0.546)	-0.063 (0.564)	-0.759 (0.560)	0.265 (0.532)	-1.321* (0.687)	0.279 (0.439)	-1.287 (0.879)
Drought	0.127 (0.811)	0.655 (1.238)	1.504 (1.475)	1.848 (1.512)	0.638 (0.753)	0.201 (2.219)	-2.532* (1.457)	0.894 (0.884)	0.463 (0.995)	0.735 (0.878)	0.431 (0.978)	0.795 (0.999)	0.343 (0.737)	0.922 (1.497)
Prec	-0.075 (0.079)	-0.120 (0.104)	-0.138 (0.235)	-0.132 (0.231)	-0.003 (0.066)	-0.481 (0.204)	-0.058 (0.233)	-0.075 (0.069)	-0.125* (0.075)	0.005 (0.074)	-0.109 (0.076)	-0.017 (0.084)	0.017 (0.083)	-0.199 (0.123)
Wind	-0.392 (0.283)	-0.396 (0.479)	-0.230 (0.612)	0.376 (0.660)	-0.106 (0.319)	-1.863* (1.062)	-1.435* (0.788)	-0.255 (0.352)	-0.659* (0.372)	0.076 (0.414)	-0.712 (0.318)	0.149 (0.532)	-0.191 (0.407)	-0.568 (0.593)
Fire	-0.261 (0.168)	-0.152 (0.187)	-0.148 (0.350)	0.029 (0.322)	-0.041 (0.159)	-1.108 (0.411)	-0.540 (0.369)	-0.113 (0.147)	-0.313* (0.164)	0.075 (0.160)	-0.306 (0.153)	0.070 (0.182)	-0.068 (0.191)	-0.267 (0.214)
Hail	-0.642 (0.401)	-0.003 (0.447)	-0.206 (0.705)	0.612 (0.632)	0.028 (0.345)	-0.905 (1.186)	-1.778 (0.852)	0.117 (0.307)	-0.326 (0.330)	0.326 (0.415)	-0.530* (0.322)	0.657 (0.530)	-0.095 (0.444)	-0.033 (0.491)

Panel D: employed persons (growth rate)														
	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	0.048 (0.087)	0.115 (0.079)	-0.059 (0.238)	-0.132 (0.261)	0.060 (0.078)	0.159 (0.113)	0.069 (0.085)	0.077 (0.070)	0.077 (0.080)	0.076 (0.071)	0.059 (0.066)	0.104 (0.100)	0.060 (0.081)	0.100 (0.082)

MaxT	-0.003 (0.053)	0.061 (0.054)	-0.258 (0.113)	-0.284 (0.123)	0.011 (0.041)	0.114 (0.093)	0.006 (0.050)	0.025 (0.040)	0.015 (0.048)	0.036 (0.040)	0.009 (0.041)	0.047 (0.053)	0.012 (0.043)	0.043 (0.054)
MinT	-0.017 (0.129)	0.065 (0.186)	0.065 (0.191)	-0.158 (0.185)	-0.007 (0.122)	0.013 (0.233)	0.011 (0.125)	-0.005 (0.121)	0.019 (0.118)	-0.037 (0.155)	0.018 (0.102)	-0.038 (0.195)	-0.043 (0.103)	0.055 (0.188)
Drought	0.621 (0.272)	0.223 (0.272)	0.733 (0.296)	0.662 (0.293)	0.429* (0.255)	0.110 (0.384)	0.478* (0.247)	0.370 (0.246)	0.466* (0.221)	0.248 (0.221)	0.394* (0.236)	0.358 (0.295)	0.448* (0.256)	0.274 (0.287)
Prec	0.009 (0.026)	0.033 (0.024)	-0.031 (0.047)	-0.046 (0.058)	0.013 (0.024)	0.054 (0.034)	0.015 (0.027)	0.019 (0.021)	0.017 (0.025)	0.022 (0.021)	0.011 (0.020)	0.031 (0.029)	0.015 (0.024)	0.024 (0.024)
Wind	0.110 (0.147)	0.095 (0.169)	0.089 (0.168)	0.069 (0.193)	0.113 (0.152)	0.054 (0.187)	0.009 (0.147)	0.115 (0.148)	0.087 (0.154)	0.132 (0.159)	0.034 (0.120)	0.213 (0.215)	0.158 (0.145)	0.043 (0.178)
Fire	0.035 (0.070)	0.059 (0.049)	-0.018 (0.094)	-0.020 (0.110)	0.033 (0.057)	0.158 (0.070)	0.040 (0.068)	0.047 (0.052)	0.044 (0.067)	0.050 (0.043)	0.029 (0.053)	0.073 (0.064)	0.049 (0.065)	0.043 (0.051)
Hail	0.142 (0.175)	0.080 (0.215)	0.042 (0.198)	0.077 (0.222)	0.110 (0.155)	-0.002 (0.242)	-0.029 (0.145)	0.112 (0.155)	0.077 (0.153)	0.131 (0.175)	0.035 (0.115)	0.200 (0.242)	0.155 (0.141)	0.008 (0.213)

Panel E: hours worked per employed person (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	0.040 (0.070)	-0.008 (0.096)	-0.338 (0.273)	-0.309 (0.270)	-0.020 (0.102)	0.076 (0.096)	0.011 (0.094)	-0.009 (0.095)	-0.011 (0.072)	0.000 (0.134)	0.002 (0.082)	-0.024 (0.127)	0.008 (0.110)	-0.030 (0.075)
MaxT	0.038 (0.042)	0.032 (0.054)	-0.080 (0.130)	-0.092 (0.128)	0.000 (0.056)	0.092 (0.071)	0.004 (0.058)	0.010 (0.056)	-0.000 (0.046)	0.024 (0.072)	0.003 (0.049)	0.022 (0.071)	0.005 (0.062)	0.017 (0.046)
MinT	0.025 (0.090)	0.062 (0.141)	0.053 (0.163)	0.110 (0.203)	0.018 (0.086)	0.183 (0.188)	0.008 (0.113)	0.045 (0.091)	0.026 (0.075)	0.065 (0.137)	0.031 (0.078)	0.061 (0.143)	0.036 (0.092)	0.048 (0.111)
Drought	0.083 (0.253)	0.065 (0.347)	0.025 (0.381)	0.199 (0.342)	0.029 (0.345)	-0.084 (0.283)	-0.004 (0.299)	0.017 (0.330)	0.026 (0.271)	-0.002 (0.437)	0.037 (0.297)	-0.030 (0.423)	-0.009 (0.365)	0.060 (0.282)
Prec	0.015 (0.023)	0.015 (0.031)	-0.020 (0.077)	-0.020 (0.076)	0.001 (0.033)	0.041 (0.029)	0.003 (0.031)	0.006 (0.032)	0.001 (0.025)	0.014 (0.042)	0.003 (0.027)	0.012 (0.041)	0.005 (0.036)	0.008 (0.025)
Wind	-0.073 (0.158)	-0.063 (0.201)	-0.223 (0.220)	-0.214 (0.235)	-0.086 (0.206)	0.017 (0.199)	-0.037 (0.183)	-0.078 (0.202)	-0.074 (0.152)	-0.074 (0.274)	-0.066 (0.173)	-0.088 (0.254)	-0.057 (0.228)	-0.095 (0.166)
Fire	0.043 (0.053)	0.038 (0.070)	-0.012 (0.150)	-0.013 (0.150)	0.024 (0.071)	0.082 (0.089)	0.012 (0.067)	0.031 (0.072)	0.021 (0.055)	0.041 (0.095)	0.024 (0.061)	0.039 (0.091)	0.033 (0.082)	0.024 (0.058)
Hail	-0.125 (0.193)	-0.115 (0.254)	-0.284 (0.264)	-0.316 (0.284)	-0.146 (0.229)	-0.049 (0.264)	-0.069 (0.207)	-0.145 (0.226)	-0.123 (0.170)	-0.157 (0.311)	-0.119 (0.193)	-0.170 (0.289)	-0.136 (0.251)	-0.137 (0.186)

Panel F: labor productivity – output per worker (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.300 (0.083)	-0.562 (0.098)	-0.720 (0.181)	-0.648 (0.184)	-0.413 (0.102)	-0.609 (0.140)	-0.167 (0.162)	-0.478 (0.097)	-0.447 (0.090)	-0.448 (0.126)	-0.446 (0.088)	-0.450 (0.132)	-0.299 (0.106)	-0.671 (0.111)
MaxT	-0.179 (0.075)	-0.292 (0.075)	-0.216 (0.206)	-0.165 (0.169)	-0.241 (0.065)	-0.269 (0.116)	-0.147 (0.120)	-0.256 (0.066)	-0.237 (0.069)	-0.256 (0.074)	-0.251 (0.069)	-0.234 (0.080)	-0.177 (0.070)	-0.371 (0.074)
MinT	0.135 (0.197)	-0.483* (0.285)	0.017 (0.352)	-0.147 (0.270)	0.067 (0.220)	-0.792 (0.359)	0.236 (0.262)	-0.097 (0.235)	-0.109 (0.238)	0.003 (0.247)	0.017 (0.227)	-0.198 (0.263)	0.143 (0.183)	-0.399 (0.328)
Drought	-0.506 (0.360)	-0.325 (0.453)	0.193 (0.517)	0.444 (0.474)	-0.493 (0.397)	-0.603 (0.487)	-0.460 (0.422)	-0.515 (0.402)	-0.625* (0.369)	-0.332 (0.445)	-0.603* (0.362)	-0.357 (0.465)	-0.561 (0.376)	-0.428 (0.486)
Prec	-0.073 (0.032)	-0.138 (0.035)	-0.068 (0.094)	-0.036 (0.090)	-0.103 (0.034)	-0.173 (0.046)	-0.053 (0.051)	-0.121 (0.034)	-0.117 (0.031)	-0.108 (0.041)	-0.118 (0.030)	-0.106 (0.045)	-0.078 (0.036)	-0.168 (0.034)
Wind	-0.470 (0.102)	-0.693 (0.144)	-0.427 (0.215)	-0.272 (0.223)	-0.499 (0.147)	-0.997 (0.259)	-0.213 (0.187)	-0.610 (0.161)	-0.583 (0.121)	-0.554 (0.212)	-0.550 (0.126)	-0.603 (0.209)	-0.436 (0.167)	-0.727 (0.191)
Fire	-0.182 (0.072)	-0.219 (0.077)	-0.026 (0.193)	0.041 (0.184)	-0.185 (0.075)	-0.438 (0.137)	-0.153 (0.102)	-0.218 (0.079)	-0.238 (0.073)	-0.174* (0.094)	-0.252 (0.068)	-0.151 (0.102)	-0.159* (0.082)	-0.282 (0.076)
Hail	-0.636 (0.123)	-0.652 (0.186)	-0.468* (0.268)	-0.308 (0.279)	-0.634 (0.151)	-0.604* (0.350)	-0.329 (0.214)	-0.665 (0.181)	-0.578 (0.149)	-0.713 (0.221)	-0.597 (0.145)	-0.685 (0.230)	-0.595 (0.152)	-0.689 (0.232)

Panel G: labor productivity – output per hour worked (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.301 (0.080)	-0.471 (0.088)	-0.301 (0.266)	-0.280 (0.249)	-0.367 (0.075)	-0.550 (0.176)	-0.147 (0.185)	-0.426 (0.064)	-0.417 (0.089)	-0.359 (0.076)	-0.411 (0.084)	-0.361 (0.098)	-0.284 (0.082)	-0.591 (0.103)
MaxT	-0.203 (0.064)	-0.304 (0.058)	-0.251 (0.126)	-0.207 (0.100)	-0.237 (0.044)	-0.360 (0.112)	-0.138 (0.112)	-0.265 (0.039)	-0.254 (0.056)	-0.245 (0.044)	-0.254 (0.054)	-0.243 (0.052)	-0.183 (0.049)	-0.394 (0.057)
MinT	0.033 (0.178)	-0.470* (0.282)	0.030 (0.196)	-0.190 (0.219)	-0.018 (0.196)	-0.588 (0.453)	0.169 (0.260)	-0.125 (0.215)	-0.080 (0.213)	-0.116 (0.250)	0.007 (0.197)	-0.295 (0.282)	0.055 (0.183)	-0.341 (0.301)
Drought	-0.416 (0.297)	0.039 (0.364)	0.310 (0.370)	0.311 (0.316)	-0.330 (0.260)	0.066 (0.534)	-0.345 (0.466)	-0.276 (0.265)	-0.492* (0.287)	0.038 (0.268)	-0.461 (0.289)	0.081 (0.281)	-0.389 (0.256)	-0.092 (0.404)
Prec	-0.081 (0.026)	-0.134 (0.025)	-0.076 (0.060)	-0.056 (0.057)	-0.101 (0.022)	-0.174 (0.043)	-0.050 (0.053)	-0.118 (0.017)	-0.118 (0.026)	-0.098 (0.021)	-0.115 (0.025)	-0.102 (0.025)	-0.079 (0.024)	-0.166 (0.024)

Wind	-0.254* (0.142)	-0.442 (0.172)	-0.118 (0.208)	0.028 (0.194)	-0.281 (0.121)	-0.762 (0.343)	-0.052 (0.321)	-0.375 (0.114)	-0.368 (0.143)	-0.302 (0.154)	-0.336 (0.136)	-0.351 (0.174)	-0.241 (0.154)	-0.467 (0.185)
Fire	-0.194 (0.054)	-0.200 (0.045)	-0.094 (0.094)	-0.037 (0.088)	-0.190 (0.044)	-0.390 (0.120)	-0.147 (0.108)	-0.215 (0.037)	-0.252 (0.054)	-0.147 (0.042)	-0.246 (0.052)	-0.139 (0.054)	-0.168 (0.052)	-0.266 (0.045)
Hail	-0.304 (0.189)	-0.356* (0.210)	-0.086 (0.221)	0.093 (0.207)	-0.343 (0.147)	-0.580 (0.419)	-0.133 (0.374)	-0.396 (0.136)	-0.360 (0.167)	-0.379 (0.178)	-0.369 (0.160)	-0.364* (0.211)	-0.345 (0.165)	-0.404* (0.219)

Panel H: real product wage (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.215 (0.092)	-0.520 (0.150)	-0.437 (0.209)	-0.387* (0.199)	-0.232 (0.089)	-0.978 (0.291)	-0.143 (0.249)	-0.364 (0.097)	-0.394 (0.116)	-0.246 (0.116)	-0.358 (0.095)	-0.308 (0.131)	-0.198 (0.071)	-0.589 (0.175)
MaxT	-0.139 (0.055)	-0.226* (0.132)	0.104 (0.172)	0.082 (0.162)	-0.114* (0.063)	-0.605 (0.243)	0.021 (0.158)	-0.187 (0.074)	-0.207 (0.071)	-0.088 (0.083)	-0.173 (0.059)	-0.147 (0.101)	-0.113 (0.044)	-0.279* (0.153)
MinT	-0.041 (0.163)	-0.402* (0.231)	-0.265 (0.179)	-0.138 (0.175)	-0.068 (0.151)	-0.764 (0.510)	0.256 (0.377)	-0.203 (0.162)	-0.170 (0.179)	-0.143 (0.258)	-0.232 (0.150)	-0.027 (0.252)	-0.068 (0.134)	-0.318 (0.293)
Drought	-0.427 (0.386)	-0.514 (0.380)	-0.455 (0.402)	-0.333 (0.325)	-0.477 (0.290)	-0.308 (0.877)	-1.597 (0.589)	-0.332 (0.292)	-0.539 (0.369)	-0.313 (0.265)	-0.593* (0.311)	-0.208 (0.337)	-0.381 (0.272)	-0.603 (0.511)
Prec	-0.064 (0.024)	-0.113 (0.046)	-0.021 (0.054)	-0.026 (0.046)	-0.056 (0.026)	-0.286 (0.092)	-0.014 (0.078)	-0.092 (0.030)	-0.109 (0.031)	-0.040 (0.035)	-0.097 (0.026)	-0.059 (0.039)	-0.056 (0.020)	-0.132 (0.055)
Wind	-0.341 (0.163)	-0.456 (0.181)	-0.231 (0.219)	-0.211 (0.203)	-0.295 (0.124)	-1.112* (0.571)	-0.360 (0.407)	-0.388 (0.135)	-0.420 (0.203)	-0.328 (0.144)	-0.428 (0.174)	-0.314 (0.158)	-0.314 (0.160)	-0.479* (0.258)
Fire	-0.122* (0.068)	-0.150 (0.115)	0.037 (0.102)	0.035 (0.070)	-0.070 (0.072)	-0.975 (0.266)	-0.132 (0.199)	-0.130* (0.078)	-0.203 (0.088)	-0.011 (0.075)	-0.176 (0.071)	-0.056 (0.091)	-0.092* (0.053)	-0.192 (0.141)
Hail	-0.439 (0.209)	-0.352* (0.212)	-0.132 (0.246)	-0.144 (0.222)	-0.293 (0.143)	-0.811 (0.710)	-0.518 (0.414)	-0.314 (0.144)	-0.277 (0.207)	-0.429 (0.134)	-0.292 (0.180)	-0.406 (0.165)	-0.346 (0.140)	-0.314 (0.288)

Panel I: real consumption wage (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.210 (0.100)	-0.388 (0.182)	-0.384* (0.204)	-0.454* (0.232)	-0.132 (0.119)	-0.949 (0.334)	-0.173 (0.082)	-0.252* (0.131)	-0.301 (0.137)	-0.145 (0.143)	-0.273 (0.111)	-0.192 (0.174)	-0.139 (0.085)	-0.424* (0.241)
MaxT	-0.136 (0.060)	-0.093 (0.144)	0.182 (0.209)	0.189 (0.183)	-0.022 (0.069)	-0.582 (0.277)	-0.118 (0.045)	-0.065 (0.083)	-0.113 (0.077)	0.003 (0.092)	-0.098 (0.064)	-0.020 (0.117)	-0.065 (0.047)	-0.083 (0.178)
MinT	-0.056 (0.168)	-0.520 (0.258)	-0.354* (0.192)	-0.287 (0.201)	-0.128 (0.166)	-1.142 (0.549)	-0.081 (0.216)	-0.279* (0.164)	-0.304 (0.188)	-0.185 (0.229)	-0.323 (0.153)	-0.145 (0.249)	-0.128 (0.132)	-0.488 (0.345)
Drought	-0.546 (0.384)	-0.798* (0.456)	-0.447 (0.376)	-0.911 (0.407)	-0.575 (0.362)	-0.347 (0.874)	-0.425 (0.368)	-0.562 (0.364)	-0.548 (0.418)	-0.551* (0.304)	-0.579 (0.357)	-0.493 (0.412)	-0.338 (0.281)	-0.954 (0.635)
Prec	-0.065 (0.028)	-0.074 (0.056)	-0.024 (0.060)	-0.026 (0.052)	-0.023 (0.033)	-0.311 (0.104)	-0.059 (0.021)	-0.054 (0.038)	-0.080 (0.038)	-0.010 (0.041)	-0.074 (0.030)	-0.019 (0.049)	-0.039* (0.024)	-0.081 (0.073)
Wind	-0.353* (0.183)	-0.419 (0.257)	-0.245 (0.238)	-0.237 (0.174)	-0.268 (0.174)	-1.201* (0.691)	-0.362 (0.179)	-0.372* (0.200)	-0.430* (0.240)	-0.274 (0.192)	-0.434 (0.205)	-0.267 (0.227)	-0.315* (0.184)	-0.445 (0.356)
Fire	-0.138* (0.072)	-0.120 (0.143)	0.053 (0.114)	0.033 (0.102)	-0.054 (0.095)	-0.922 (0.287)	-0.122 (0.038)	-0.110 (0.108)	-0.190* (0.103)	0.017 (0.100)	-0.165* (0.086)	-0.025 (0.125)	-0.078 (0.060)	-0.165 (0.186)
Hail	-0.423* (0.225)	-0.218 (0.305)	-0.100 (0.254)	-0.102 (0.259)	-0.182 (0.194)	-0.569 (0.814)	-0.414 (0.173)	-0.189 (0.205)	-0.157 (0.233)	-0.303 (0.194)	-0.199 (0.201)	-0.232 (0.247)	-0.252 (0.154)	-0.141 (0.400)

Panel L: real wage wedge (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.017 (0.056)	0.022 (0.067)	0.059 (0.116)	-0.043 (0.116)	0.042 (0.041)	-0.057 (0.116)	-0.012 (0.234)	0.033 (0.053)	0.018 (0.044)	0.047 (0.064)	0.025 (0.047)	0.035 (0.067)	0.026 (0.047)	0.033 (0.081)
MaxT	-0.029 (0.056)	0.047 (0.047)	0.018 (0.113)	0.024 (0.074)	0.033 (0.026)	-0.020 (0.110)	-0.124 (0.176)	0.046* (0.027)	0.012 (0.039)	0.056 (0.036)	0.007 (0.044)	0.066 (0.041)	0.012 (0.042)	0.062 (0.053)
MinT	-0.043 (0.071)	-0.201 (0.147)	-0.188 (0.120)	-0.183 (0.122)	-0.082 (0.070)	-0.460 (0.225)	-0.316 (0.336)	-0.114 (0.091)	-0.157 (0.065)	-0.091 (0.129)	-0.119* (0.071)	-0.159 (0.157)	-0.057 (0.055)	-0.258 (0.165)
Drought	-0.045 (0.149)	-0.261 (0.174)	0.130 (0.241)	-0.419 (0.190)	-0.049 (0.156)	-0.046 (0.310)	1.201 (0.445)	-0.186 (0.169)	0.051 (0.147)	-0.222 (0.174)	0.077 (0.149)	-0.278* (0.157)	0.097 (0.146)	-0.327 (0.209)
Prec	-0.012 (0.020)	0.007 (0.021)	-0.010 (0.035)	-0.017 (0.029)	0.011 (0.012)	-0.039 (0.042)	-0.035 (0.082)	0.010 (0.015)	-0.002 (0.015)	0.017 (0.019)	-0.001 (0.017)	0.017 (0.021)	0.005 (0.017)	0.006 (0.026)
Wind	-0.015 (0.055)	0.019 (0.099)	0.050 (0.097)	0.040 (0.124)	0.028 (0.075)	-0.212 (0.172)	-0.033 (0.285)	0.005 (0.098)	-0.033 (0.059)	0.058 (0.113)	-0.025 (0.068)	0.044 (0.116)	-0.012 (0.057)	0.019 (0.119)
Fire	-0.031 (0.047)	0.009 (0.052)	0.015 (0.058)	-0.001 (0.058)	0.008 (0.027)	-0.087 (0.117)	-0.012 (0.203)	0.003 (0.040)	-0.010 (0.035)	0.021 (0.047)	-0.009 (0.041)	0.019 (0.052)	0.000 (0.038)	0.004 (0.063)
Hail	0.009 (0.063)	0.148 (0.138)	0.129 (0.092)	0.116 (0.142)	0.116 (0.078)	0.128 (0.238)	0.037 (0.310)	0.125 (0.106)	0.100 (0.062)	0.145 (0.127)	0.088 (0.071)	0.167 (0.133)	0.072 (0.060)	0.194 (0.147)

Panel M: labor share (change)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	0.078 (0.107)	0.175 (0.174)	-0.029 (0.190)	0.005 (0.186)	0.152 (0.116)	0.066 (0.349)	-0.069 (0.317)	0.171 (0.108)	0.154 (0.129)	0.129 (0.127)	0.173 (0.115)	0.096 (0.163)	0.049 (0.102)	0.332 (0.211)
MaxT	0.080 (0.089)	0.182 (0.129)	0.265 (0.196)	0.289 (0.177)	0.156* (0.080)	-0.142 (0.225)	0.115 (0.261)	0.143* (0.074)	0.140 (0.087)	0.140 (0.090)	0.153* (0.080)	0.117 (0.111)	0.070 (0.073)	0.295 (0.145)
MinT	-0.088 (0.146)	0.234 (0.279)	-0.220 (0.279)	0.236 (0.242)	-0.034 (0.186)	0.974* (0.545)	0.153 (0.481)	0.022 (0.174)	0.066 (0.219)	-0.016 (0.199)	-0.064 (0.197)	0.208 (0.253)	-0.128 (0.137)	0.340 (0.346)
Drought	-0.260 (0.362)	-0.286 (0.346)	-0.794 (0.517)	-1.072 (0.332)	-0.275 (0.322)	0.837 (0.560)	-1.462* (0.795)	-0.047 (0.292)	-0.228 (0.342)	-0.139 (0.316)	-0.248 (0.321)	-0.101 (0.391)	-0.159 (0.349)	-0.275 (0.434)
Prec	0.016 (0.037)	0.065 (0.052)	-0.001 (0.071)	0.005 (0.067)	0.049 (0.038)	0.025 (0.102)	0.004 (0.114)	0.053 (0.033)	0.046 (0.041)	0.049 (0.039)	0.048 (0.038)	0.047 (0.047)	0.014 (0.033)	0.111* (0.059)
Wind	-0.019 (0.162)	0.269 (0.192)	-0.077 (0.253)	-0.157 (0.224)	0.072 (0.162)	0.826 (0.643)	-0.301 (0.424)	0.150 (0.151)	0.086 (0.195)	0.120 (0.173)	0.061 (0.186)	0.160 (0.220)	-0.067 (0.173)	0.364 (0.222)
Fire	0.051 (0.093)	0.112 (0.132)	-0.002 (0.123)	-0.053 (0.125)	0.088 (0.102)	0.084 (0.353)	-0.003 (0.278)	0.099 (0.090)	0.082 (0.107)	0.098 (0.106)	0.092 (0.099)	0.081 (0.124)	0.037 (0.084)	0.174 (0.149)
Hail	0.034 (0.188)	0.310 (0.227)	0.021 (0.263)	-0.117 (0.232)	0.200 (0.175)	-0.154 (0.744)	-0.322 (0.430)	0.257 (0.162)	0.196 (0.206)	0.191 (0.194)	0.206 (0.202)	0.174 (0.243)	0.072 (0.170)	0.421 (0.264)

Panel N: unemployment rate (change)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.018 (0.042)	-0.094 (0.040)	0.020 (0.096)	0.004 (0.101)	-0.060 (0.037)	-0.054 (0.064)	-0.016 (0.049)	-0.064* (0.034)	-0.042 (0.041)	-0.085 (0.040)	-0.034 (0.039)	-0.105 (0.044)	-0.045 (0.037)	-0.079* (0.045)
MaxT	0.025 (0.028)	-0.053* (0.030)	0.192 (0.057)	0.164 (0.052)	-0.009 (0.023)	-0.073 (0.053)	0.009 (0.031)	-0.018 (0.023)	-0.005 (0.028)	-0.031 (0.024)	0.002 (0.027)	-0.050 (0.025)	-0.003 (0.023)	-0.038 (0.030)
MinT	-0.158 (0.066)	-0.053 (0.101)	-0.176* (0.105)	0.009 (0.099)	-0.078 (0.066)	0.022 (0.136)	-0.075 (0.073)	-0.062 (0.071)	-0.081 (0.070)	-0.036 (0.096)	-0.078 (0.066)	-0.035 (0.113)	-0.071 (0.056)	-0.052 (0.109)
Drought	-0.349 (0.135)	-0.188 (0.167)	-0.479 (0.206)	-0.408 (0.169)	-0.297 (0.131)	0.004 (0.224)	-0.194* (0.116)	-0.262* (0.138)	-0.250 (0.156)	-0.264 (0.126)	-0.249* (0.146)	-0.266* (0.144)	-0.277 (0.115)	-0.220 (0.192)
Prec	-0.000 (0.013)	-0.025 (0.012)	0.027 (0.022)	0.020 (0.021)	-0.011 (0.011)	-0.022 (0.021)	-0.001 (0.014)	-0.014 (0.011)	-0.007 (0.013)	-0.021* (0.011)	-0.004 (0.012)	-0.029 (0.012)	-0.009 (0.011)	-0.017 (0.014)
Wind	-0.049 (0.056)	-0.098 (0.081)	-0.053 (0.080)	-0.099 (0.087)	-0.098 (0.061)	0.034 (0.130)	0.011 (0.074)	-0.090 (0.065)	-0.022 (0.068)	-0.168 (0.073)	-0.018 (0.062)	-0.190 (0.090)	-0.103 (0.052)	-0.053 (0.090)
Fire	0.005 (0.032)	-0.033 (0.024)	0.060* (0.036)	0.028 (0.032)	-0.017 (0.027)	-0.035 (0.046)	0.001 (0.035)	-0.021 (0.025)	-0.005 (0.030)	-0.038* (0.023)	0.001 (0.029)	-0.052 (0.024)	-0.019 (0.029)	-0.018 (0.026)
Hail	-0.003 (0.067)	-0.131 (0.095)	-0.003 (0.091)	-0.091 (0.105)	-0.087 (0.057)	-0.030 (0.161)	0.020 (0.077)	-0.094 (0.062)	-0.023 (0.067)	-0.174 (0.074)	-0.017 (0.059)	-0.207 (0.095)	-0.084 (0.052)	-0.077 (0.098)

Panel O: labor force (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	0.038 (0.051)	0.001 (0.062)	-0.110 (0.155)	-0.163 (0.173)	0.004 (0.050)	0.069 (0.111)	0.022 (0.063)	0.013 (0.046)	0.049 (0.044)	-0.042 (0.059)	0.024 (0.038)	-0.005 (0.073)	0.017 (0.053)	0.010 (0.064)
MaxT	0.032 (0.033)	0.006 (0.037)	-0.038 (0.078)	-0.086 (0.083)	0.011 (0.027)	0.028 (0.083)	-0.003 (0.034)	0.015 (0.027)	0.025 (0.026)	-0.006 (0.034)	0.015 (0.023)	0.009 (0.040)	0.017 (0.031)	0.007 (0.037)
MinT	-0.196 (0.075)	0.007 (0.098)	-0.099 (0.102)	-0.124 (0.109)	-0.107* (0.065)	0.050 (0.153)	-0.102 (0.091)	-0.081 (0.059)	-0.087 (0.063)	-0.076 (0.082)	-0.087* (0.048)	-0.075 (0.099)	-0.136 (0.065)	-0.007 (0.105)
Drought	0.209 (0.168)	-0.004 (0.186)	0.120 (0.208)	0.226 (0.235)	0.096 (0.158)	0.031 (0.253)	0.223 (0.194)	0.072 (0.151)	0.185 (0.143)	-0.066 (0.175)	0.123 (0.132)	0.017 (0.198)	0.137 (0.163)	0.008 (0.165)
Prec	0.011 (0.017)	0.006 (0.017)	-0.006 (0.035)	-0.021 (0.044)	0.003 (0.015)	0.029 (0.030)	0.002 (0.019)	0.007 (0.014)	0.014 (0.014)	-0.006 (0.018)	0.009 (0.012)	0.003 (0.021)	0.006 (0.017)	0.007 (0.016)
Wind	0.032 (0.097)	-0.028 (0.107)	-0.055 (0.105)	-0.073 (0.136)	-0.009 (0.103)	0.072 (0.125)	-0.035 (0.123)	0.007 (0.094)	0.055 (0.086)	-0.075 (0.114)	0.019 (0.072)	-0.026 (0.141)	0.013 (0.102)	-0.010 (0.105)
Fire	0.042 (0.039)	0.026 (0.031)	0.038 (0.069)	0.022 (0.086)	0.022 (0.034)	0.121 (0.059)	0.022 (0.041)	0.033 (0.031)	0.050 (0.034)	0.005 (0.037)	0.039 (0.029)	0.020 (0.044)	0.032 (0.040)	0.032 (0.031)
Hail	0.114 (0.109)	-0.085 (0.139)	-0.056 (0.124)	-0.075 (0.158)	0.018 (0.114)	-0.084 (0.134)	-0.058 (0.132)	0.016 (0.109)	0.067 (0.093)	-0.083 (0.138)	0.028 (0.077)	-0.029 (0.171)	0.059 (0.103)	-0.069 (0.132)

Panel P: entry margin (excess labor force growth over employment growth)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.019 (0.045)	-0.110 (0.047)	0.017 (0.110)	0.002 (0.117)	-0.068* (0.041)	-0.066 (0.073)	-0.018 (0.053)	-0.073* (0.039)	-0.048 (0.046)	-0.099 (0.047)	-0.039 (0.043)	-0.122 (0.053)	-0.051 (0.041)	-0.092* (0.053)
MaxT	0.027 (0.030)	-0.060* (0.035)	0.213 (0.064)	0.184 (0.059)	-0.010 (0.025)	-0.084 (0.060)	0.009 (0.034)	-0.021 (0.026)	-0.006 (0.031)	-0.036 (0.028)	0.001 (0.029)	-0.056* (0.030)	-0.004 (0.025)	-0.043 (0.035)
MinT	-0.173 (0.072)	-0.067 (0.118)	-0.199* (0.117)	0.016 (0.114)	-0.088 (0.074)	0.012 (0.159)	-0.080 (0.079)	-0.072 (0.081)	-0.094 (0.079)	-0.040 (0.113)	-0.085 (0.074)	-0.049 (0.135)	-0.077 (0.062)	-0.067 (0.127)

Drought	-0.380 (0.151)	-0.209 (0.192)	-0.528 (0.234)	-0.452 (0.192)	-0.327 (0.147)	0.008 (0.257)	-0.201 (0.125)	-0.289* (0.155)	-0.273 (0.176)	-0.291 (0.146)	-0.269 (0.164)	-0.301* (0.167)	-0.300 (0.128)	-0.248 (0.219)
Prec	-0.000 (0.014)	-0.028* (0.015)	0.030 (0.025)	0.023 (0.023)	-0.013 (0.012)	-0.026 (0.024)	-0.001 (0.015)	-0.016 (0.012)	-0.008 (0.014)	-0.024* (0.013)	-0.004 (0.013)	-0.033 (0.014)	-0.011 (0.012)	-0.020 (0.016)
Wind	-0.053 (0.060)	-0.118 (0.095)	-0.061 (0.091)	-0.114 (0.099)	-0.111* (0.067)	0.023 (0.156)	0.017 (0.080)	-0.105 (0.073)	-0.023 (0.075)	-0.199 (0.086)	-0.018 (0.068)	-0.225 (0.106)	-0.117 (0.056)	-0.064 (0.105)
Fire	0.005 (0.035)	-0.038 (0.029)	0.067* (0.039)	0.033 (0.035)	-0.018 (0.029)	-0.042 (0.053)	0.002 (0.037)	-0.023 (0.029)	-0.005 (0.034)	-0.043 (0.027)	0.000 (0.032)	-0.057 (0.028)	-0.022 (0.032)	-0.019 (0.031)
Hail	-0.004 (0.072)	-0.155 (0.111)	-0.003 (0.103)	-0.106 (0.118)	-0.099 (0.062)	-0.048 (0.193)	0.027 (0.084)	-0.109 (0.069)	-0.024 (0.074)	-0.207 (0.086)	-0.018 (0.065)	-0.243 (0.112)	-0.097* (0.057)	-0.090 (0.115)

The table reports estimates from asymmetric dynamic panel regressions. All specifications include Autometrics-selected country fixed effects and macro-financial controls for economic uncertainty, geopolitical risk, financial stress and business cycle conditions. The conditioning variable is climate uncertainty (IQR), computed from the E3CI composite index and from each of its components. It is interacted with pairs of dummies partitioning countries according to whether they stand above or below the annual cross-country mean of the Notre Dame Global Adaptation Index (Adaptation), of the CCPI-mm mitigation index (Mitigation), of real per capita GDP (Income) and of average temperature (Temperature), and, in addition, according to EU membership (Institutions) and geographical position (Latitude: North/South; Longitude: West/East). Coefficients are scaled by the pooled standard deviation of the annual within-country change of the underlying series, so that they measure the impact of a typical annual change. The climate measures are Melly-Pons FE. Bold figures denote significance at the 10% level or better; an asterisk marks significance at 10% but not 5%.

Table A6-B: Dynamic panel regressions with GETS-Autometrics country fixed effects and macro-fin control variables: Asymmetric models, climate risk (Median) (Melly-Pons FE measures)

Panel A: real GDP growth rate														
	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.124 (0.076)	-0.159* (0.092)	-0.316 (0.255)	-0.331 (0.267)	-0.141 (0.091)	-0.218* (0.127)	-0.072 (0.105)	-0.161* (0.091)	-0.161 (0.076)	-0.139 (0.108)	-0.181 (0.070)	-0.107 (0.125)	-0.105 (0.095)	-0.216 (0.088)
MaxT	-0.069 (0.050)	-0.079 (0.060)	-0.140 (0.160)	-0.154 (0.166)	-0.079 (0.057)	-0.100 (0.088)	-0.042 (0.068)	-0.086 (0.057)	-0.087* (0.051)	-0.074 (0.066)	-0.101 (0.048)	-0.052 (0.075)	-0.059 (0.060)	-0.117 (0.058)
MinT †	-0.472* (0.280)	-0.243 (0.267)	-0.544 (0.384)	-0.557 (0.410)	-0.345* (0.180)	0.346 (0.375)	-0.393 (0.264)	-0.280 (0.187)	-0.222 (0.217)	-0.397 (0.179)	-0.323 (0.219)	-0.236 (0.203)	-0.283 (0.182)	-0.311 (0.272)
Drought	-0.275 (0.338)	-0.293 (0.396)	-0.354 (0.474)	0.038 (0.539)	-0.170 (0.344)	-0.349 (0.455)	0.178 (0.427)	-0.239 (0.329)	-0.207 (0.304)	-0.186 (0.377)	-0.299 (0.293)	-0.038 (0.447)	-0.127 (0.304)	-0.300 (0.388)
Prec	-0.123 (0.305)	-0.228 (0.309)	0.074 (0.449)	-0.209 (0.360)	-0.248 (0.281)	-0.347 (0.485)	-0.083 (0.450)	-0.284 (0.263)	-0.299 (0.288)	-0.210 (0.277)	-0.294 (0.293)	-0.215 (0.298)	-0.165 (0.282)	-0.412 (0.308)
Wind	-0.133 (0.108)	-0.192 (0.156)	-0.107 (0.189)	-0.037 (0.217)	-0.121 (0.147)	-0.469 (0.148)	-0.103 (0.115)	-0.174 (0.151)	-0.182 (0.119)	-0.145 (0.182)	-0.193* (0.106)	-0.128 (0.206)	-0.103 (0.147)	-0.248 (0.153)
Fire	-0.131 (0.101)	-0.131 (0.122)	-0.076 (0.296)	-0.032 (0.317)	-0.126 (0.120)	-0.246* (0.147)	-0.089 (0.121)	-0.145 (0.120)	-0.161 (0.101)	-0.108 (0.140)	-0.197 (0.089)	-0.053 (0.165)	-0.091 (0.127)	-0.204* (0.109)
Hail	0.290 (0.178)	0.463 (0.213)	0.774 (0.471)	1.052 (0.422)	0.344* (0.187)	0.460 (0.336)	-0.095 (0.303)	0.414 (0.176)	0.335* (0.192)	0.419 (0.180)	0.339 (0.169)	0.412* (0.226)	0.265 (0.187)	0.504 (0.229)

Panel B: real consumption growth rate														
	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.160 (0.105)	-0.180* (0.092)	-0.417 (0.293)	-0.408 (0.267)	-0.133 (0.101)	-0.354 (0.162)	-0.097 (0.135)	-0.171* (0.090)	-0.175* (0.095)	-0.146 (0.101)	-0.200 (0.087)	-0.107 (0.115)	-0.126 (0.119)	-0.215 (0.095)
MaxT	-0.095 (0.064)	-0.106* (0.057)	-0.215 (0.182)	-0.219 (0.167)	-0.083 (0.060)	-0.173* (0.104)	-0.047 (0.080)	-0.099* (0.055)	-0.097 (0.060)	-0.088 (0.059)	-0.111 (0.056)	-0.066 (0.068)	-0.074 (0.069)	-0.124 (0.060)
MinT †	-0.506* (0.307)	-0.169 (0.305)	-0.569 (0.424)	-0.468 (0.472)	-0.267 (0.203)	0.473 (0.551)	-0.155 (0.257)	-0.215 (0.197)	-0.177 (0.232)	-0.260 (0.220)	-0.265 (0.232)	-0.115 (0.255)	-0.241 (0.202)	-0.128 (0.321)
Drought	-0.255 (0.435)	0.014 (0.356)	-0.110 (0.570)	0.199 (0.496)	-0.068 (0.385)	-0.295 (0.529)	-0.270 (0.490)	-0.085 (0.329)	-0.206 (0.367)	0.054 (0.370)	-0.306 (0.344)	0.221 (0.438)	-0.124 (0.398)	-0.073 (0.361)
Prec	-0.278 (0.321)	-0.582 (0.292)	-0.266 (0.427)	-0.490 (0.398)	-0.363 (0.281)	-0.743 (0.592)	-0.028 (0.375)	-0.463* (0.261)	-0.384 (0.324)	-0.475* (0.254)	-0.395 (0.324)	-0.459* (0.267)	-0.278 (0.283)	-0.634* (0.330)
Wind	-0.185 (0.158)	-0.150 (0.153)	-0.122 (0.233)	-0.081 (0.204)	-0.109 (0.158)	-0.511 (0.260)	-0.222 (0.204)	-0.156 (0.146)	-0.186 (0.146)	-0.125 (0.163)	-0.203 (0.131)	-0.100 (0.188)	-0.124 (0.190)	-0.210 (0.149)
Fire	-0.154 (0.138)	-0.105 (0.111)	-0.108 (0.348)	-0.037 (0.315)	-0.095 (0.130)	-0.357* (0.207)	-0.060 (0.177)	-0.131 (0.119)	-0.145 (0.131)	-0.092 (0.121)	-0.183 (0.117)	-0.034 (0.144)	-0.090 (0.157)	-0.168 (0.117)
Hail	0.365 (0.163)	0.809 (0.229)	0.756 (0.478)	1.128 (0.449)	0.497 (0.176)	0.811* (0.433)	0.185 (0.186)	0.598 (0.153)	0.550 (0.159)	0.575 (0.210)	0.531 (0.144)	0.607 (0.264)	0.406 (0.161)	0.771 (0.229)

Panel C: real investment growth rate														
	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.204 (0.167)	-0.229 (0.189)	-0.414 (0.388)	-0.318 (0.446)	-0.032 (0.142)	-1.008 (0.388)	-0.324 (0.420)	-0.151 (0.130)	-0.278* (0.149)	-0.000 (0.138)	-0.271* (0.146)	-0.008 (0.164)	-0.027 (0.178)	-0.360 (0.224)
MaxT	-0.136 (0.099)	-0.153 (0.125)	-0.254 (0.274)	-0.216 (0.270)	-0.020 (0.085)	-0.671 (0.262)	-0.146 (0.262)	-0.096 (0.081)	-0.167* (0.090)	0.000 (0.087)	-0.161* (0.090)	-0.006 (0.100)	-0.008 (0.105)	-0.237 (0.150)
MinT †	-1.162* (0.606)	-0.198 (0.848)	-0.561 (0.887)	-0.019 (1.093)	-0.196 (0.452)	-0.668 (1.920)	-1.863* (0.992)	-0.057 (0.472)	-0.391 (0.541)	0.011 (0.467)	-0.605 (0.518)	0.398 (0.577)	-0.383 (0.435)	0.154 (1.040)
Drought	0.012 (0.593)	0.808 (0.689)	0.124 (0.856)	1.256 (0.844)	0.259 (0.556)	0.318 (1.215)	-2.244 (0.869)	0.535 (0.493)	-0.122 (0.525)	0.857 (0.635)	-0.291 (0.528)	1.157 (0.786)	-0.172 (0.622)	0.877 (0.753)
Prec	-0.265 (0.448)	-1.086 (0.833)	-0.562 (0.924)	-1.195 (1.034)	-0.157 (0.394)	-2.802 (1.780)	1.391 (1.538)	-0.754 (0.491)	-0.692 (0.524)	-0.329 (0.499)	-0.456 (0.542)	-0.697 (0.609)	0.235 (0.464)	-1.683* (1.009)
Wind	-0.120 (0.162)	-0.163 (0.281)	-0.068 (0.360)	0.158 (0.369)	-0.001 (0.152)	-0.736 (0.513)	-0.250 (0.665)	-0.084 (0.194)	-0.209 (0.200)	0.070 (0.224)	-0.194 (0.184)	0.044 (0.269)	0.067 (0.180)	-0.308 (0.334)
Fire	-0.288 (0.188)	-0.148 (0.190)	-0.194 (0.388)	0.013 (0.346)	-0.042 (0.172)	-1.079 (0.402)	-0.582 (0.441)	-0.109 (0.151)	-0.322* (0.172)	0.089 (0.168)	-0.321* (0.164)	0.094 (0.191)	-0.070 (0.208)	-0.269 (0.214)
Hail	0.302 (0.420)	0.989* (0.510)	0.625 (0.981)	1.180* (0.682)	0.264 (0.446)	2.243 (0.848)	0.291 (0.871)	0.690* (0.387)	0.708 (0.471)	0.564 (0.451)	0.696 (0.476)	0.584 (0.543)	0.317 (0.515)	1.114* (0.644)

Panel D: employed persons (growth rate)														
	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	0.020 (0.057)	0.058 (0.050)	-0.114 (0.103)	-0.140 (0.120)	0.025 (0.048)	0.104 (0.072)	0.016 (0.054)	0.038 (0.046)	0.031 (0.054)	0.042 (0.044)	0.019 (0.042)	0.062 (0.062)	0.034 (0.051)	0.038 (0.051)

MaxT	0.010 (0.034)	0.035 (0.030)	-0.064 (0.061)	-0.082 (0.072)	0.015 (0.028)	0.056 (0.047)	0.010 (0.032)	0.021 (0.027)	0.016 (0.031)	0.026 (0.026)	0.010 (0.025)	0.037 (0.035)	0.017 (0.029)	0.024 (0.031)
MinT †	0.045 (0.178)	-0.056 (0.174)	-0.195 (0.219)	-0.262 (0.236)	0.034 (0.099)	-0.131 (0.269)	-0.006 (0.109)	0.023 (0.099)	0.019 (0.114)	0.023 (0.112)	0.024 (0.100)	0.015 (0.153)	0.040 (0.095)	-0.030 (0.164)
Drought	0.220 (0.197)	0.281 (0.213)	0.138 (0.207)	0.353* (0.215)	0.150 (0.176)	0.654 (0.224)	0.257 (0.185)	0.223 (0.159)	0.243 (0.178)	0.201 (0.176)	0.176 (0.137)	0.309 (0.255)	0.211 (0.167)	0.249 (0.242)
Prec	-0.070 (0.117)	0.136 (0.177)	-0.231 (0.162)	-0.390 (0.176)	-0.010 (0.114)	0.181 (0.287)	0.004 (0.154)	0.021 (0.114)	0.001 (0.123)	0.047 (0.139)	0.002 (0.120)	0.048 (0.163)	-0.023 (0.107)	0.079 (0.177)
Wind	0.048 (0.073)	0.047 (0.080)	0.012 (0.080)	0.011 (0.094)	0.046 (0.075)	0.022 (0.083)	-0.005 (0.076)	0.048 (0.072)	0.033 (0.075)	0.057 (0.075)	0.017 (0.059)	0.082 (0.103)	0.072 (0.072)	0.005 (0.080)
Fire	0.034 (0.076)	0.069 (0.056)	-0.037 (0.104)	-0.030 (0.122)	0.034 (0.061)	0.182 (0.077)	0.037 (0.072)	0.051 (0.056)	0.045 (0.071)	0.057 (0.049)	0.031 (0.055)	0.079 (0.073)	0.052 (0.068)	0.046 (0.057)
Hail	0.025 (0.088)	-0.126 (0.132)	-0.004 (0.203)	0.217 (0.240)	-0.025 (0.093)	-0.142 (0.219)	-0.023 (0.095)	-0.051 (0.084)	-0.045 (0.077)	-0.055 (0.120)	-0.020 (0.075)	-0.095 (0.146)	0.025 (0.088)	-0.149 (0.136)

Panel E: hours worked per employed person (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	0.023 (0.049)	0.017 (0.061)	-0.144 (0.176)	-0.145 (0.174)	-0.004 (0.067)	0.075 (0.057)	0.001 (0.062)	0.005 (0.065)	-0.002 (0.050)	0.015 (0.087)	0.003 (0.056)	0.009 (0.082)	0.007 (0.074)	0.002 (0.051)
MaxT	0.016 (0.029)	0.015 (0.037)	-0.049 (0.099)	-0.051 (0.099)	-0.001 (0.039)	0.048 (0.040)	0.001 (0.037)	0.005 (0.038)	-0.001 (0.031)	0.012 (0.050)	0.001 (0.033)	0.010 (0.049)	0.003 (0.043)	0.007 (0.031)
MinT †	0.044 (0.095)	-0.070 (0.128)	-0.196 (0.161)	-0.197 (0.146)	-0.029 (0.089)	-0.143 (0.183)	-0.036 (0.107)	-0.037 (0.090)	-0.025 (0.081)	-0.054 (0.120)	-0.024 (0.082)	-0.065 (0.124)	-0.028 (0.097)	-0.058 (0.090)
Drought	-0.055 (0.192)	-0.149 (0.282)	-0.222 (0.241)	-0.191 (0.282)	-0.073 (0.210)	-0.139 (0.298)	0.060 (0.187)	-0.099 (0.206)	-0.058 (0.127)	-0.117 (0.321)	-0.029 (0.156)	-0.182 (0.307)	-0.014 (0.211)	-0.181 (0.200)
Prec	0.111 (0.108)	0.172 (0.147)	0.133 (0.156)	0.095 (0.157)	0.049 (0.120)	0.330 (0.221)	0.018 (0.148)	0.093 (0.124)	0.036 (0.108)	0.159 (0.161)	0.039 (0.108)	0.176 (0.174)	0.057 (0.134)	0.130 (0.125)
Wind	-0.026 (0.084)	0.019 (0.112)	-0.064 (0.123)	-0.076 (0.122)	-0.030 (0.113)	0.076 (0.107)	-0.018 (0.100)	-0.017 (0.111)	-0.024 (0.086)	-0.007 (0.149)	-0.024 (0.095)	-0.004 (0.142)	-0.024 (0.123)	-0.008 (0.095)
Fire	0.040 (0.060)	0.035 (0.079)	-0.053 (0.172)	-0.056 (0.172)	0.017 (0.080)	0.085 (0.094)	0.009 (0.073)	0.025 (0.080)	0.016 (0.061)	0.034 (0.108)	0.019 (0.068)	0.031 (0.102)	0.029 (0.091)	0.016 (0.064)
Hail	-0.011 (0.064)	0.148 (0.114)	0.299 (0.230)	0.218 (0.209)	0.081 (0.059)	0.018 (0.157)	-0.005 (0.091)	0.078 (0.062)	0.064 (0.051)	0.079 (0.108)	0.036 (0.052)	0.137 (0.133)	0.017 (0.055)	0.151* (0.090)

Panel F: labor productivity – output per worker (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.182 (0.058)	-0.294 (0.058)	-0.259 (0.175)	-0.198 (0.170)	-0.226 (0.060)	-0.378 (0.091)	-0.127 (0.101)	-0.262 (0.060)	-0.252 (0.054)	-0.242 (0.078)	-0.257 (0.053)	-0.234 (0.083)	-0.176 (0.066)	-0.352 (0.059)
MaxT	-0.106 (0.039)	-0.171 (0.040)	-0.125 (0.115)	-0.087 (0.108)	-0.136 (0.038)	-0.204 (0.064)	-0.079 (0.063)	-0.152 (0.039)	-0.146 (0.037)	-0.143 (0.047)	-0.150 (0.037)	-0.135 (0.051)	-0.104 (0.042)	-0.209 (0.040)
MinT †	-0.578 (0.267)	-0.243 (0.270)	-0.278 (0.344)	-0.189 (0.262)	-0.459 (0.182)	0.416 (0.356)	-0.447* (0.256)	-0.384 (0.185)	-0.343 (0.214)	-0.462 (0.177)	-0.431 (0.202)	-0.319* (0.192)	-0.386 (0.164)	-0.401 (0.298)
Drought	-0.514 (0.252)	-0.517* (0.287)	-0.301 (0.344)	-0.100 (0.311)	-0.285 (0.298)	-0.892 (0.428)	-0.049 (0.391)	-0.416 (0.288)	-0.392 (0.264)	-0.362 (0.332)	-0.383 (0.263)	-0.376 (0.341)	-0.279 (0.268)	-0.521 (0.347)
Prec	-0.189 (0.258)	-0.669 (0.243)	0.005 (0.405)	0.036 (0.273)	-0.438 (0.219)	-0.762 (0.353)	-0.233 (0.389)	-0.516 (0.207)	-0.496 (0.229)	-0.475 (0.218)	-0.500 (0.226)	-0.467* (0.241)	-0.270 (0.227)	-0.842 (0.235)
Wind	-0.180 (0.076)	-0.316 (0.095)	-0.130 (0.135)	-0.047 (0.132)	-0.228 (0.091)	-0.487 (0.125)	-0.117 (0.101)	-0.278 (0.097)	-0.262 (0.077)	-0.263 (0.121)	-0.253 (0.074)	-0.277 (0.126)	-0.206 (0.095)	-0.335 (0.105)
Fire	-0.207 (0.077)	-0.261 (0.081)	-0.075 (0.214)	-0.001 (0.207)	-0.214 (0.081)	-0.490 (0.137)	-0.164 (0.111)	-0.254 (0.084)	-0.265 (0.075)	-0.215 (0.103)	-0.281 (0.070)	-0.189* (0.112)	-0.183 (0.086)	-0.329 (0.079)
Hail	0.356 (0.135)	0.770 (0.201)	0.655* (0.365)	0.704 (0.261)	0.505 (0.173)	0.592 (0.241)	0.023 (0.299)	0.574 (0.160)	0.482 (0.170)	0.588 (0.169)	0.441 (0.146)	0.657 (0.208)	0.270* (0.153)	0.877 (0.225)

Panel G: labor productivity – output per hour worked (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.175 (0.055)	-0.270 (0.051)	-0.157 (0.146)	-0.109 (0.137)	-0.204 (0.046)	-0.398 (0.091)	-0.108 (0.116)	-0.242 (0.036)	-0.242 (0.054)	-0.205 (0.045)	-0.236 (0.052)	-0.209 (0.055)	-0.165 (0.052)	-0.330 (0.047)
MaxT	-0.109 (0.034)	-0.161 (0.030)	-0.116 (0.078)	-0.088 (0.071)	-0.128 (0.027)	-0.217 (0.057)	-0.070 (0.066)	-0.146 (0.022)	-0.146 (0.032)	-0.125 (0.025)	-0.143 (0.031)	-0.127 (0.031)	-0.101 (0.030)	-0.204 (0.029)
MinT †	-0.455 (0.231)	-0.089 (0.276)	-0.141 (0.322)	-0.047 (0.244)	-0.353 (0.154)	0.256 (0.458)	-0.346 (0.230)	-0.309* (0.161)	-0.327* (0.183)	-0.292* (0.169)	-0.380 (0.173)	-0.159 (0.212)	-0.311 (0.138)	-0.320 (0.278)
Drought	-0.289 (0.225)	-0.188 (0.273)	0.053 (0.273)	0.223 (0.225)	-0.042 (0.228)	-0.677 (0.556)	0.021 (0.461)	-0.151 (0.227)	-0.186 (0.244)	-0.057 (0.273)	-0.206 (0.233)	0.004 (0.324)	-0.119 (0.233)	-0.153 (0.321)
Prec	-0.340* (0.192)	-0.798 (0.202)	-0.292 (0.300)	-0.279 (0.238)	-0.547 (0.135)	-0.850 (0.412)	-0.281 (0.308)	-0.627 (0.138)	-0.583 (0.169)	-0.595 (0.165)	-0.555 (0.158)	-0.652 (0.186)	-0.378 (0.153)	-0.956 (0.197)

Wind	-0.105 (0.076)	-0.253 (0.096)	-0.055 (0.107)	0.021 (0.095)	-0.159 (0.071)	-0.422 (0.151)	-0.057 (0.166)	-0.206 (0.062)	-0.194 (0.079)	-0.184 (0.073)	-0.173 (0.073)	-0.222 (0.085)	-0.143* (0.081)	-0.255 (0.091)
Fire	-0.211 (0.062)	-0.235 (0.052)	-0.099 (0.108)	-0.033 (0.101)	-0.210 (0.050)	-0.454 (0.128)	-0.152 (0.127)	-0.243 (0.041)	-0.272 (0.061)	-0.178 (0.050)	-0.267 (0.058)	-0.171 (0.063)	-0.187 (0.059)	-0.302 (0.051)
Hail	0.296 (0.115)	0.543 (0.162)	0.179 (0.277)	0.290 (0.184)	0.353 (0.118)	0.509* (0.294)	-0.018 (0.281)	0.426 (0.121)	0.350 (0.142)	0.428 (0.132)	0.359 (0.117)	0.425 (0.172)	0.216 (0.133)	0.641 (0.198)

Panel H: real product wage (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.142 (0.051)	-0.225 (0.102)	-0.045 (0.124)	-0.055 (0.106)	-0.116 (0.059)	-0.642 (0.183)	-0.030 (0.164)	-0.193 (0.065)	-0.222 (0.069)	-0.094 (0.073)	-0.197 (0.056)	-0.138* (0.084)	-0.123 (0.041)	-0.266 (0.117)
MaxT	-0.083 (0.031)	-0.133 (0.063)	-0.013 (0.072)	-0.021 (0.061)	-0.069 (0.035)	-0.392 (0.115)	-0.015 (0.096)	-0.111 (0.039)	-0.129 (0.041)	-0.051 (0.044)	-0.113 (0.033)	-0.079 (0.051)	-0.070 (0.025)	-0.160 (0.074)
MinT †	-0.264 (0.219)	-0.248 (0.367)	0.031 (0.291)	0.078 (0.260)	-0.197 (0.160)	-0.218 (0.686)	-0.252 (0.445)	-0.192 (0.172)	-0.228 (0.183)	-0.143 (0.214)	-0.133 (0.152)	-0.328 (0.254)	-0.138 (0.110)	-0.386 (0.406)
Drought	-0.331 (0.257)	-0.597 (0.285)	-0.152 (0.299)	-0.162 (0.256)	-0.262 (0.230)	-1.442* (0.802)	-0.851 (0.521)	-0.366* (0.217)	-0.482 (0.330)	-0.304 (0.248)	-0.456* (0.271)	-0.342 (0.274)	-0.219 (0.220)	-0.721* (0.416)
Prec	-0.233 (0.107)	-0.381 (0.282)	0.034 (0.225)	0.095 (0.219)	-0.126 (0.117)	-1.210* (0.712)	0.286 (0.412)	-0.321* (0.170)	-0.374 (0.146)	-0.061 (0.241)	-0.326 (0.133)	-0.139 (0.244)	-0.201* (0.106)	-0.363 (0.335)
Wind	-0.169 (0.084)	-0.156 (0.098)	-0.067 (0.113)	-0.052 (0.101)	-0.125* (0.065)	-0.412* (0.244)	-0.135 (0.195)	-0.156 (0.071)	-0.157* (0.089)	-0.147* (0.086)	-0.175 (0.075)	-0.118 (0.090)	-0.160 (0.074)	-0.144 (0.124)
Fire	-0.143* (0.073)	-0.171 (0.124)	0.042 (0.114)	0.037 (0.078)	-0.078 (0.076)	-1.036 (0.325)	-0.148 (0.212)	-0.149* (0.082)	-0.218 (0.094)	-0.035 (0.083)	-0.190 (0.076)	-0.082 (0.098)	-0.109 (0.056)	-0.214 (0.151)
Hail	0.223 (0.098)	0.830 (0.199)	0.376 (0.134)	0.345 (0.235)	0.282 (0.109)	1.307 (0.314)	-0.055 (0.255)	0.517 (0.107)	0.492 (0.123)	0.404 (0.184)	0.424 (0.099)	0.529 (0.215)	0.192 (0.097)	0.885 (0.227)

Panel I: real consumption wage (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.146 (0.059)	-0.147 (0.125)	-0.027 (0.138)	-0.027 (0.122)	-0.054 (0.075)	-0.686 (0.222)	-0.135 (0.042)	-0.117 (0.087)	-0.168 (0.085)	-0.034 (0.089)	-0.154 (0.069)	-0.058 (0.109)	-0.094* (0.050)	-0.159 (0.161)
MaxT	-0.085 (0.035)	-0.079 (0.076)	-0.001 (0.085)	-0.002 (0.073)	-0.027 (0.043)	-0.411 (0.141)	-0.073 (0.025)	-0.058 (0.050)	-0.087* (0.047)	-0.012 (0.053)	-0.080 (0.039)	-0.024 (0.064)	-0.047* (0.029)	-0.083 (0.098)
MinT †	-0.248 (0.253)	0.092 (0.404)	0.233 (0.331)	0.198 (0.353)	-0.016 (0.192)	0.679 (0.733)	-0.077 (0.223)	0.032 (0.197)	0.029 (0.194)	0.009 (0.241)	0.070 (0.168)	-0.075 (0.297)	-0.029 (0.126)	0.175 (0.496)
Drought	-0.279 (0.267)	-0.570 (0.380)	-0.095 (0.281)	-0.246 (0.325)	-0.330 (0.282)	-1.032 (0.850)	-0.278 (0.239)	-0.439 (0.297)	-0.453 (0.362)	-0.372 (0.274)	-0.417 (0.311)	-0.432 (0.352)	-0.271 (0.230)	-0.660 (0.529)
Prec	-0.254 (0.115)	-0.203 (0.310)	-0.025 (0.255)	0.173 (0.215)	0.019 (0.141)	-1.350* (0.791)	-0.223 (0.203)	-0.134 (0.176)	-0.306* (0.169)	0.137 (0.235)	-0.273* (0.148)	0.093 (0.272)	-0.133 (0.130)	-0.163 (0.371)
Wind	-0.184* (0.099)	-0.139 (0.131)	-0.088 (0.129)	-0.050 (0.128)	-0.095 (0.085)	-0.539* (0.285)	-0.217 (0.097)	-0.129 (0.097)	-0.163 (0.109)	-0.097 (0.098)	-0.182* (0.094)	-0.066 (0.117)	-0.145 (0.088)	-0.129 (0.168)
Fire	-0.156 (0.077)	-0.131 (0.153)	0.069 (0.125)	0.051 (0.108)	-0.056 (0.100)	-0.963 (0.341)	-0.146 (0.042)	-0.119 (0.114)	-0.198* (0.111)	0.004 (0.108)	-0.173* (0.092)	-0.038 (0.135)	-0.092 (0.063)	-0.171 (0.198)
Hail	0.169 (0.106)	0.621 (0.230)	0.315* (0.178)	0.358 (0.302)	0.179 (0.145)	1.157 (0.356)	0.041 (0.146)	0.378 (0.143)	0.372 (0.139)	0.295 (0.217)	0.311 (0.112)	0.410 (0.277)	0.163 (0.117)	0.634 (0.274)

Panel L: real wage wedge (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.026 (0.042)	0.024 (0.045)	0.021 (0.077)	0.012 (0.069)	0.020 (0.025)	-0.061 (0.088)	-0.085 (0.169)	0.023 (0.034)	-0.004 (0.031)	0.040 (0.041)	-0.003 (0.036)	0.038 (0.044)	0.002 (0.034)	0.029 (0.053)
MaxT	-0.016 (0.027)	0.015 (0.028)	0.001 (0.050)	-0.003 (0.040)	0.015 (0.015)	-0.042 (0.061)	-0.046 (0.102)	0.016 (0.019)	0.001 (0.020)	0.024 (0.023)	0.000 (0.022)	0.026 (0.026)	0.006 (0.021)	0.017 (0.033)
MinT †	-0.011 (0.151)	0.206 (0.161)	0.202 (0.198)	0.083 (0.116)	0.080 (0.064)	0.638 (0.293)	0.101 (0.446)	0.111 (0.079)	0.124 (0.091)	0.084 (0.102)	0.101 (0.099)	0.128 (0.128)	0.049 (0.083)	0.293 (0.191)
Drought	0.082 (0.114)	0.108 (0.162)	0.211 (0.147)	0.016 (0.183)	-0.005 (0.112)	0.338 (0.218)	0.618 (0.484)	-0.025 (0.137)	0.065 (0.101)	-0.004 (0.170)	0.071 (0.108)	-0.017 (0.173)	-0.030 (0.089)	0.147 (0.183)
Prec	-0.100 (0.144)	0.009 (0.127)	-0.168 (0.161)	-0.071 (0.096)	0.052 (0.080)	-0.364 (0.265)	-0.619 (0.458)	0.071 (0.074)	-0.065 (0.107)	0.115 (0.113)	-0.064 (0.118)	0.118 (0.134)	0.005 (0.121)	-0.007 (0.148)
Wind	-0.022 (0.033)	0.005 (0.052)	-0.005 (0.056)	0.021 (0.059)	0.025 (0.036)	-0.174* (0.105)	-0.110 (0.151)	0.019 (0.047)	-0.020 (0.035)	0.048 (0.053)	-0.017 (0.040)	0.042 (0.056)	0.007 (0.032)	0.003 (0.063)
Fire	-0.031 (0.050)	0.021 (0.057)	0.036 (0.059)	0.022 (0.066)	0.016 (0.029)	-0.068 (0.112)	-0.026 (0.216)	0.014 (0.044)	-0.005 (0.036)	0.033 (0.052)	-0.004 (0.043)	0.032 (0.056)	0.002 (0.040)	0.021 (0.068)
Hail	-0.017 (0.072)	-0.049 (0.072)	-0.086 (0.124)	0.066 (0.095)	-0.032 (0.067)	-0.000 (0.173)	0.057 (0.239)	-0.036 (0.060)	-0.025 (0.069)	-0.030 (0.085)	-0.029 (0.060)	-0.022 (0.090)	0.012 (0.071)	-0.087 (0.075)

Panel M: labor share (change)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	0.045	0.153	0.072	0.073	0.110	0.056	0.031	0.117	0.107	0.107	0.111	0.101	0.034	0.239*
	(0.078)	(0.109)	(0.118)	(0.108)	(0.080)	(0.225)	(0.236)	(0.072)	(0.085)	(0.086)	(0.081)	(0.103)	(0.070)	(0.126)
MaxT	0.031	0.090	0.045	0.050	0.071	-0.021	0.022	0.073*	0.065	0.070	0.070	0.062	0.027	0.146*
	(0.048)	(0.068)	(0.083)	(0.077)	(0.047)	(0.154)	(0.144)	(0.042)	(0.051)	(0.050)	(0.047)	(0.060)	(0.041)	(0.077)
MinT †	0.300	0.133	0.254	0.162	0.311	-1.250*	0.219	0.276	0.250	0.303	0.379	0.071	0.289	0.222
	(0.246)	(0.509)	(0.325)	(0.351)	(0.274)	(0.723)	(0.673)	(0.278)	(0.297)	(0.316)	(0.257)	(0.402)	(0.199)	(0.601)
Drought	-0.105	-0.221	-0.055	-0.478	-0.221	-0.290	-1.113	-0.118	-0.260	-0.170	-0.179	-0.303	-0.202	-0.267
	(0.271)	(0.313)	(0.360)	(0.302)	(0.254)	(1.142)	(0.690)	(0.222)	(0.337)	(0.220)	(0.288)	(0.352)	(0.253)	(0.367)
Prec	0.102	0.465	0.076	0.331	0.341	0.224	0.547	0.307*	0.347	0.310	0.316	0.363	0.110	0.772
	(0.253)	(0.289)	(0.372)	(0.254)	(0.211)	(0.396)	(0.727)	(0.185)	(0.243)	(0.222)	(0.245)	(0.252)	(0.219)	(0.331)
Wind	-0.029	0.190*	-0.041	-0.070	0.063	0.716	-0.059	0.103	0.093	0.072	0.053	0.136	-0.017	0.255
	(0.083)	(0.103)	(0.122)	(0.120)	(0.085)	(0.344)	(0.227)	(0.077)	(0.099)	(0.084)	(0.092)	(0.106)	(0.083)	(0.117)
Fire	0.056	0.134	0.025	-0.035	0.102	0.056	-0.006	0.113	0.097	0.104	0.108	0.087	0.039	0.204
	(0.101)	(0.143)	(0.130)	(0.131)	(0.109)	(0.387)	(0.296)	(0.097)	(0.115)	(0.114)	(0.108)	(0.135)	(0.090)	(0.161)
Hail	-0.139	-0.129	-0.054	-0.343	-0.198	0.451	0.037	-0.158	-0.116	-0.172	-0.208*	-0.009	-0.040	-0.327
	(0.132)	(0.248)	(0.331)	(0.261)	(0.094)	(0.544)	(0.415)	(0.120)	(0.179)	(0.131)	(0.121)	(0.235)	(0.130)	(0.331)

Panel N: unemployment rate (change)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	0.003	-0.046*	0.079*	0.057	-0.022	-0.033	0.003	-0.027	-0.010	-0.045*	-0.004	-0.059	-0.019	-0.030
	(0.027)	(0.027)	(0.046)	(0.045)	(0.023)	(0.047)	(0.030)	(0.023)	(0.026)	(0.025)	(0.025)	(0.027)	(0.024)	(0.028)
MaxT	0.005	-0.030*	0.052*	0.040	-0.011	-0.028	0.003	-0.015	-0.006	-0.025*	-0.002	-0.035	-0.008	-0.021
	(0.016)	(0.016)	(0.028)	(0.027)	(0.014)	(0.029)	(0.017)	(0.014)	(0.016)	(0.014)	(0.015)	(0.015)	(0.014)	(0.017)
MinT †	0.130	-0.015	0.225*	0.122	0.009	-0.022	0.059	0.001	0.016	-0.006	0.015	-0.009	0.028	-0.046
	(0.084)	(0.092)	(0.122)	(0.105)	(0.058)	(0.154)	(0.079)	(0.058)	(0.069)	(0.068)	(0.068)	(0.082)	(0.055)	(0.096)
Drought	-0.105	-0.162*	-0.067	-0.184	-0.111	-0.162	-0.088	-0.122*	-0.079	-0.179*	-0.074	-0.203*	-0.121*	-0.115
	(0.095)	(0.094)	(0.110)	(0.112)	(0.076)	(0.145)	(0.116)	(0.073)	(0.092)	(0.092)	(0.086)	(0.105)	(0.071)	(0.116)
Prec	0.042	-0.094	0.176	0.188	-0.006	-0.117	0.008	-0.026	-0.011	-0.039	0.010	-0.082	0.005	-0.061
	(0.081)	(0.088)	(0.109)	(0.083)	(0.063)	(0.161)	(0.092)	(0.064)	(0.084)	(0.076)	(0.083)	(0.084)	(0.062)	(0.096)
Wind	-0.019	-0.045	-0.002	-0.024	-0.040	0.004	-0.004	-0.038	-0.009	-0.074	-0.004	-0.089	-0.048*	-0.017
	(0.029)	(0.038)	(0.037)	(0.037)	(0.029)	(0.056)	(0.035)	(0.031)	(0.033)	(0.037)	(0.030)	(0.045)	(0.026)	(0.043)
Fire	0.009	-0.040	0.075	0.036	-0.018	-0.044	0.001	-0.023	-0.004	-0.045*	0.002	-0.061	-0.021	-0.020
	(0.035)	(0.027)	(0.038)	(0.036)	(0.028)	(0.051)	(0.038)	(0.026)	(0.032)	(0.026)	(0.031)	(0.027)	(0.031)	(0.028)
Hail	0.014	0.127	0.054	0.000	0.068	0.054	-0.022	0.075*	0.051	0.089	0.045	0.106	0.017	0.134
	(0.046)	(0.053)	(0.088)	(0.081)	(0.043)	(0.088)	(0.061)	(0.042)	(0.050)	(0.072)	(0.048)	(0.079)	(0.045)	(0.062)

Panel O: labor force (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	0.026	0.006	-0.048	-0.083	0.006	0.062	-0.002	0.015	0.031	-0.014	0.019	0.002	0.015	0.010
	(0.034)	(0.035)	(0.078)	(0.093)	(0.032)	(0.065)	(0.037)	(0.029)	(0.029)	(0.037)	(0.025)	(0.045)	(0.034)	(0.035)
MaxT	0.018	0.002	-0.015	-0.036	0.006	0.021	0.002	0.008	0.017	-0.007	0.010	0.003	0.010	0.004
	(0.020)	(0.021)	(0.046)	(0.055)	(0.018)	(0.043)	(0.022)	(0.017)	(0.017)	(0.022)	(0.015)	(0.026)	(0.020)	(0.020)
MinT †	0.203	-0.067	0.045	-0.095	0.076	-0.284	0.069	0.050	0.084	0.002	0.062	0.030	0.099*	-0.069
	(0.094)	(0.101)	(0.109)	(0.114)	(0.056)	(0.214)	(0.085)	(0.056)	(0.063)	(0.074)	(0.053)	(0.085)	(0.058)	(0.110)
Drought	0.104	0.042	-0.025	0.082	0.011	0.395	0.139	0.060	0.134	-0.030	0.097	0.015	0.055	0.085
	(0.122)	(0.151)	(0.126)	(0.159)	(0.121)	(0.200)	(0.138)	(0.106)	(0.098)	(0.135)	(0.077)	(0.181)	(0.115)	(0.161)
Prec	-0.003	0.048	0.007	-0.123	0.005	0.076	-0.049	0.022	0.031	-0.009	0.015	0.014	0.002	0.033
	(0.100)	(0.106)	(0.105)	(0.127)	(0.078)	(0.189)	(0.115)	(0.073)	(0.075)	(0.090)	(0.067)	(0.103)	(0.093)	(0.103)
Wind	0.015	-0.004	-0.022	-0.027	-0.001	0.039	-0.045	0.010	0.027	-0.030	0.015	-0.014	0.011	-0.004
	(0.047)	(0.053)	(0.049)	(0.070)	(0.050)	(0.064)	(0.058)	(0.047)	(0.043)	(0.057)	(0.036)	(0.070)	(0.051)	(0.050)
Fire	0.046	0.027	0.028	0.012	0.021	0.136	0.014	0.035	0.054	0.002	0.042	0.018	0.033	0.033
	(0.042)	(0.037)	(0.078)	(0.097)	(0.038)	(0.065)	(0.045)	(0.034)	(0.037)	(0.042)	(0.031)	(0.051)	(0.043)	(0.037)
Hail	0.030	0.036	0.115	0.234	0.037	0.001	-0.035	0.037	-0.004	0.086	0.033	0.025	0.042	0.014
	(0.053)	(0.112)	(0.133)	(0.160)	(0.054)	(0.197)	(0.084)	(0.058)	(0.048)	(0.077)	(0.041)	(0.099)	(0.054)	(0.110)

Panel P: entry margin (excess labor force growth over employment growth)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	0.004	-0.054*	0.087*	0.064	-0.025	-0.041	0.004	-0.031	-0.011	-0.052*	-0.005	-0.068	-0.022	-0.035
	(0.029)	(0.032)	(0.053)	(0.052)	(0.026)	(0.055)	(0.032)	(0.026)	(0.029)	(0.029)	(0.027)	(0.032)	(0.026)	(0.033)
MaxT	0.005	-0.034*	0.057*	0.045	-0.013	-0.033	0.004	-0.018	-0.006	-0.029*	-0.002	-0.040	-0.010	-0.024
	(0.018)	(0.019)	(0.032)	(0.030)	(0.015)	(0.033)	(0.019)	(0.016)	(0.017)	(0.017)	(0.016)	(0.019)	(0.015)	(0.020)
MinT †	0.142	-0.011	0.247*	0.134	0.010	-0.006	0.061	0.003	0.019	-0.006	0.014	-0.000	0.031	-0.047
	(0.092)	(0.110)	(0.136)	(0.122)	(0.065)	(0.181)	(0.086)	(0.066)	(0.078)	(0.081)	(0.075)	(0.099)	(0.061)	(0.114)

Drought	-0.114 (0.103)	-0.188* (0.109)	-0.068 (0.124)	-0.213* (0.128)	-0.126 (0.082)	-0.188 (0.173)	-0.093 (0.126)	-0.140* (0.081)	-0.088 (0.102)	-0.207* (0.108)	-0.082 (0.095)	-0.236* (0.125)	-0.137* (0.077)	-0.132 (0.134)
Prec	0.046 (0.088)	-0.107 (0.103)	0.191 (0.122)	0.217 (0.095)	-0.008 (0.069)	-0.139 (0.187)	0.007 (0.099)	-0.030 (0.073)	-0.016 (0.094)	-0.043 (0.091)	0.008 (0.091)	-0.091 (0.103)	0.004 (0.068)	-0.070 (0.112)
Wind	-0.020 (0.032)	-0.054 (0.045)	-0.003 (0.042)	-0.027 (0.042)	-0.045 (0.032)	-0.006 (0.067)	-0.001 (0.038)	-0.045 (0.035)	-0.009 (0.037)	-0.088 (0.043)	-0.004 (0.033)	-0.106 (0.053)	-0.055* (0.028)	-0.022 (0.050)
Fire	0.010 (0.037)	-0.045 (0.032)	0.084 (0.041)	0.041 (0.040)	-0.020 (0.031)	-0.053 (0.059)	0.001 (0.040)	-0.026 (0.030)	-0.004 (0.035)	-0.052* (0.030)	0.002 (0.033)	-0.068 (0.032)	-0.025 (0.033)	-0.022 (0.033)
Hail	0.015 (0.051)	0.149 (0.063)	0.068 (0.099)	0.007 (0.092)	0.081 (0.049)	0.058 (0.100)	-0.019 (0.067)	0.087* (0.049)	0.061 (0.058)	0.103 (0.089)	0.053 (0.055)	0.123 (0.096)	0.021 (0.052)	0.155 (0.072)

The table reports estimates from asymmetric dynamic panel regressions. All specifications include Autometrics-selected country fixed effects and macro-financial controls for economic uncertainty, geopolitical risk, financial stress and business cycle conditions. The conditioning variable is climate risk (Median), computed from the E3CI composite index and from each of its components. It is interacted with pairs of dummies partitioning countries according to whether they stand above or below the annual cross-country mean of the Notre Dame Global Adaptation Index (Adaptation), of the CCPI-mm mitigation index (Mitigation), of real per capita GDP (Income) and of average temperature (Temperature), and, in addition, according to EU membership (Institutions) and geographical position (Latitude: North/South; Longitude: West/East). Coefficients are scaled by the pooled standard deviation of the annual within-country change of the underlying series, so that they measure the impact of a typical annual change. The climate measures are Melly-Pons FE. Bold figures denote significance at the 10% level or better; an asterisk marks significance at 10% but not 5%.

Table A6-C: Dynamic panel regressions with GETS-Autometrics country fixed effects and macro-fin control variables: Asymmetric models, relative climate risk (Median/IQR) (Melly-Pons FE measures)

Panel A: real GDP growth rate														
	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.137 (0.105)	-0.160 (0.124)	-0.484 (0.412)	-0.482 (0.429)	-0.152 (0.126)	-0.223 (0.153)	-0.044 (0.149)	-0.177 (0.121)	-0.169 (0.106)	-0.157 (0.143)	-0.194* (0.102)	-0.118 (0.161)	-0.107 (0.125)	-0.245 (0.121)
MaxT	-0.106 (0.117)	-0.107 (0.156)	-0.376 (0.384)	-0.390 (0.408)	-0.136 (0.139)	-0.100 (0.179)	-0.026 (0.142)	-0.142 (0.144)	-0.122 (0.126)	-0.145 (0.164)	-0.149 (0.123)	-0.100 (0.182)	-0.097 (0.136)	-0.188 (0.157)
MinT †	-0.413* (0.248)	-0.101 (0.238)	-0.426 (0.371)	-0.249 (0.381)	-0.287 (0.186)	0.566 (0.357)	-0.410 (0.265)	-0.189 (0.197)	-0.161 (0.228)	-0.286 (0.186)	-0.287 (0.226)	-0.085 (0.201)	-0.259 (0.203)	-0.116 (0.261)
Drought	-0.271 (0.347)	-0.269 (0.400)	-0.384 (0.491)	0.042 (0.546)	-0.126 (0.327)	-0.274 (0.445)	0.183 (0.441)	-0.185 (0.309)	-0.166 (0.299)	-0.126 (0.348)	-0.252 (0.294)	0.014 (0.410)	-0.078 (0.284)	-0.259 (0.388)
Prec	-0.087 (0.302)	-0.224 (0.345)	0.070 (0.485)	-0.303 (0.381)	-0.256 (0.291)	-0.273 (0.503)	-0.023 (0.454)	-0.285 (0.278)	-0.279 (0.304)	-0.228 (0.289)	-0.252 (0.309)	-0.271 (0.308)	-0.166 (0.283)	-0.403 (0.354)
Wind	-0.146 (0.118)	-0.201 (0.164)	-0.107 (0.210)	-0.040 (0.232)	-0.122 (0.154)	-0.468 (0.162)	-0.138 (0.126)	-0.175 (0.156)	-0.190 (0.133)	-0.143 (0.183)	-0.202* (0.121)	-0.124 (0.206)	-0.106 (0.152)	-0.253 (0.168)
Fire	-0.196 (0.164)	-0.270 (0.202)	-0.388 (0.625)	-0.411 (0.692)	-0.227 (0.204)	-0.371 (0.265)	-0.049 (0.224)	-0.273 (0.196)	-0.286 (0.178)	-0.199 (0.226)	-0.329 (0.160)	-0.130 (0.265)	-0.140 (0.205)	-0.406 (0.198)
Hail	0.265 (0.185)	0.430 (0.207)	0.662 (0.447)	0.960 (0.390)	0.321* (0.183)	0.439 (0.338)	-0.129 (0.311)	0.391 (0.173)	0.316 (0.200)	0.391 (0.170)	0.321* (0.181)	0.383* (0.216)	0.240 (0.186)	0.490 (0.229)

Panel B: real consumption growth rate														
	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.177 (0.134)	-0.246 (0.110)	-0.632 (0.472)	-0.642 (0.428)	-0.170 (0.132)	-0.374 (0.160)	-0.096 (0.171)	-0.218 (0.110)	-0.215* (0.119)	-0.192 (0.136)	-0.246 (0.112)	-0.143 (0.146)	-0.147 (0.147)	-0.291 (0.113)
MaxT	-0.182 (0.134)	-0.239* (0.123)	-0.503 (0.431)	-0.553 (0.388)	-0.184 (0.133)	-0.249 (0.153)	-0.081 (0.172)	-0.207* (0.119)	-0.192 (0.126)	-0.199 (0.149)	-0.213* (0.119)	-0.162 (0.167)	-0.155 (0.147)	-0.264 (0.120)
MinT †	-0.346 (0.271)	0.131 (0.267)	-0.287 (0.416)	-0.083 (0.469)	-0.153 (0.204)	0.797 (0.496)	-0.114 (0.282)	-0.065 (0.203)	-0.080 (0.228)	-0.054 (0.222)	-0.203 (0.220)	0.147 (0.246)	-0.172 (0.222)	0.131 (0.301)
Drought	-0.254 (0.437)	0.046 (0.367)	-0.128 (0.579)	0.229 (0.511)	-0.036 (0.365)	-0.247 (0.539)	-0.275 (0.462)	-0.048 (0.315)	-0.181 (0.362)	0.100 (0.342)	-0.275 (0.344)	0.261 (0.402)	-0.090 (0.359)	-0.040 (0.380)
Prec	-0.256 (0.306)	-0.668 (0.333)	-0.277 (0.441)	-0.625 (0.430)	-0.400 (0.285)	-0.671 (0.600)	0.007 (0.376)	-0.497* (0.270)	-0.388 (0.330)	-0.541* (0.281)	-0.384 (0.333)	-0.554* (0.285)	-0.297 (0.279)	-0.687* (0.372)
Wind	-0.198 (0.166)	-0.157 (0.166)	-0.136 (0.251)	-0.102 (0.223)	-0.114 (0.163)	-0.499* (0.285)	-0.243 (0.215)	-0.160 (0.154)	-0.197 (0.157)	-0.122 (0.165)	-0.214 (0.143)	-0.096 (0.189)	-0.128 (0.190)	-0.217 (0.169)
Fire	-0.237 (0.210)	-0.386 (0.173)	-0.544 (0.742)	-0.527 (0.670)	-0.239 (0.207)	-0.631 (0.308)	-0.076 (0.284)	-0.329* (0.176)	-0.322 (0.196)	-0.279 (0.188)	-0.353 (0.178)	-0.229 (0.229)	-0.182 (0.238)	-0.475 (0.187)
Hail	0.327* (0.173)	0.815 (0.216)	0.654 (0.446)	1.044 (0.433)	0.479 (0.171)	0.790* (0.428)	0.120 (0.196)	0.583 (0.145)	0.526 (0.164)	0.567 (0.212)	0.505 (0.152)	0.604 (0.273)	0.379 (0.159)	0.772 (0.225)

Panel C: real investment growth rate														
	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.161 (0.227)	-0.321 (0.250)	-0.516 (0.739)	-0.463 (0.705)	0.018 (0.184)	-1.202 (0.416)	-0.194 (0.616)	-0.196 (0.166)	-0.328* (0.187)	0.015 (0.178)	-0.320* (0.191)	0.002 (0.200)	0.036 (0.228)	-0.522* (0.298)
MaxT	-0.198 (0.221)	-0.439 (0.289)	-0.466 (0.775)	-0.516 (0.735)	-0.007 (0.176)	-1.367 (0.362)	-0.183 (0.564)	-0.227 (0.175)	-0.341* (0.176)	-0.029 (0.199)	-0.328* (0.183)	-0.045 (0.218)	0.023 (0.214)	-0.634* (0.349)
MinT †	-1.087* (0.569)	0.182 (0.853)	-0.490 (0.948)	0.371 (1.197)	-0.135 (0.518)	0.374 (1.820)	-2.079 (0.992)	0.130 (0.557)	-0.314 (0.613)	0.252 (0.531)	-0.596 (0.560)	0.738 (0.646)	-0.382 (0.501)	0.475 (0.987)
Drought	0.020 (0.603)	0.902 (0.742)	0.038 (0.900)	1.299 (0.858)	0.220 (0.549)	0.577 (1.256)	-2.149 (0.905)	0.531 (0.506)	-0.107 (0.535)	0.859 (0.626)	-0.275 (0.532)	1.169 (0.767)	-0.196 (0.595)	0.974 (0.817)
Prec	-0.216 (0.449)	-1.290 (0.941)	-0.696 (1.030)	-1.736* (1.039)	-0.213 (0.423)	-2.602 (1.924)	1.618 (1.486)	-0.854 (0.548)	-0.699 (0.577)	-0.498 (0.544)	-0.401 (0.601)	-0.982 (0.654)	0.236 (0.460)	-1.905* (1.109)
Wind	-0.121 (0.167)	-0.135 (0.302)	-0.059 (0.388)	0.217 (0.407)	0.002 (0.161)	-0.616 (0.549)	-0.173 (0.672)	-0.077 (0.212)	-0.188 (0.222)	0.070 (0.235)	-0.184 (0.201)	0.063 (0.287)	0.062 (0.176)	-0.270 (0.363)
Fire	-0.367 (0.307)	-0.399 (0.346)	-0.070 (1.106)	0.111 (1.067)	-0.046 (0.273)	-1.644 (0.555)	-0.491 (0.962)	-0.298 (0.271)	-0.612 (0.302)	0.132 (0.304)	-0.576* (0.308)	0.094 (0.351)	-0.069 (0.330)	-0.652* (0.395)
Hail	0.238 (0.449)	1.020* (0.550)	0.479 (1.020)	1.085 (0.797)	0.231 (0.469)	2.348 (0.848)	0.018 (0.798)	0.714* (0.410)	0.731 (0.506)	0.524 (0.474)	0.723 (0.512)	0.534 (0.587)	0.285 (0.508)	1.169* (0.690)

Panel D: employed persons (growth rate)														
	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	0.032 (0.066)	0.090 (0.062)	-0.134 (0.183)	-0.173 (0.211)	0.043 (0.061)	0.119 (0.075)	0.036 (0.069)	0.058 (0.054)	0.050 (0.062)	0.066 (0.056)	0.034 (0.051)	0.091 (0.077)	0.048 (0.060)	0.068 (0.063)

MaxT	0.047 (0.066)	0.076 (0.067)	-0.048 (0.181)	-0.105 (0.209)	0.051 (0.062)	0.068 (0.076)	0.047 (0.066)	0.054 (0.056)	0.051 (0.060)	0.058 (0.060)	0.037 (0.050)	0.082 (0.081)	0.050 (0.059)	0.060 (0.068)
MinT †	0.023 (0.177)	-0.060 (0.149)	-0.198 (0.202)	-0.210 (0.218)	0.023 (0.113)	-0.059 (0.236)	-0.032 (0.128)	0.020 (0.110)	0.008 (0.135)	0.025 (0.113)	0.001 (0.110)	0.039 (0.152)	0.045 (0.119)	-0.043 (0.143)
Drought	0.194 (0.189)	0.283 (0.215)	0.113 (0.211)	0.369* (0.219)	0.131 (0.169)	0.634 (0.212)	0.238 (0.187)	0.207 (0.152)	0.217 (0.169)	0.200 (0.171)	0.153 (0.137)	0.305 (0.241)	0.187 (0.154)	0.246 (0.243)
Prec	-0.072 (0.124)	0.133 (0.205)	-0.266 (0.191)	-0.478 (0.194)	-0.017 (0.123)	0.156 (0.298)	0.024 (0.160)	0.012 (0.124)	0.004 (0.127)	0.029 (0.158)	0.015 (0.126)	0.011 (0.186)	-0.030 (0.109)	0.077 (0.206)
Wind	0.052 (0.076)	0.054 (0.085)	0.027 (0.089)	0.019 (0.103)	0.057 (0.078)	-0.000 (0.091)	-0.010 (0.081)	0.055 (0.075)	0.036 (0.079)	0.069 (0.080)	0.017 (0.065)	0.098 (0.104)	0.076 (0.074)	0.015 (0.088)
Fire	0.038 (0.111)	0.132 (0.098)	0.143 (0.271)	0.119 (0.312)	0.059 (0.104)	0.193* (0.115)	0.072 (0.116)	0.083 (0.089)	0.071 (0.101)	0.099 (0.090)	0.041 (0.082)	0.148 (0.127)	0.064 (0.103)	0.107 (0.104)
Hail	0.015 (0.094)	-0.155 (0.143)	-0.072 (0.210)	0.162 (0.250)	-0.043 (0.099)	-0.144 (0.220)	-0.049 (0.104)	-0.064 (0.091)	-0.052 (0.083)	-0.080 (0.134)	-0.027 (0.081)	-0.121 (0.164)	0.028 (0.085)	-0.192 (0.147)

Panel E: hours worked per employed person (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	0.041 (0.059)	0.029 (0.077)	-0.175 (0.270)	-0.165 (0.265)	-0.001 (0.084)	0.107 (0.066)	0.027 (0.081)	0.012 (0.079)	0.004 (0.060)	0.028 (0.109)	0.012 (0.067)	0.017 (0.105)	0.015 (0.088)	0.011 (0.065)
MaxT	0.019 (0.063)	0.019 (0.093)	-0.133 (0.263)	-0.118 (0.260)	-0.021 (0.089)	0.094 (0.084)	0.011 (0.083)	-0.010 (0.087)	-0.017 (0.068)	0.007 (0.117)	-0.011 (0.072)	-0.001 (0.119)	-0.014 (0.092)	0.006 (0.077)
MinT †	0.060 (0.086)	-0.025 (0.103)	-0.169 (0.146)	-0.209 (0.139)	0.005 (0.096)	-0.163 (0.156)	-0.012 (0.113)	-0.007 (0.095)	-0.001 (0.090)	-0.016 (0.121)	0.003 (0.093)	-0.029 (0.114)	-0.008 (0.108)	-0.006 (0.083)
Drought	-0.059 (0.188)	-0.162 (0.280)	-0.226 (0.241)	-0.205 (0.289)	-0.060 (0.188)	-0.145 (0.296)	0.076 (0.173)	-0.089 (0.186)	-0.045 (0.116)	-0.112 (0.295)	-0.018 (0.140)	-0.177 (0.289)	0.003 (0.183)	-0.188 (0.197)
Prec	0.099 (0.113)	0.175 (0.159)	0.130 (0.182)	0.106 (0.193)	0.035 (0.122)	0.308 (0.220)	0.007 (0.153)	0.084 (0.125)	0.024 (0.107)	0.154 (0.168)	0.030 (0.107)	0.170 (0.184)	0.041 (0.133)	0.133 (0.134)
Wind	-0.015 (0.090)	0.027 (0.114)	-0.060 (0.134)	-0.066 (0.136)	-0.015 (0.115)	0.074 (0.111)	-0.006 (0.106)	-0.004 (0.114)	-0.011 (0.093)	0.006 (0.146)	-0.011 (0.100)	0.009 (0.142)	-0.008 (0.123)	0.001 (0.101)
Fire	0.052 (0.090)	0.008 (0.131)	-0.152 (0.391)	-0.123 (0.391)	-0.000 (0.131)	0.072 (0.129)	0.002 (0.120)	0.010 (0.124)	-0.007 (0.094)	0.034 (0.171)	0.002 (0.103)	0.024 (0.169)	0.028 (0.140)	-0.019 (0.105)
Hail	-0.039 (0.069)	0.123 (0.128)	0.224 (0.229)	0.104 (0.220)	0.065 (0.059)	-0.019 (0.178)	-0.036 (0.098)	0.060 (0.066)	0.049 (0.052)	0.053 (0.119)	0.022 (0.054)	0.108 (0.146)	-0.000 (0.056)	0.130 (0.101)

Panel F: labor productivity – output per worker (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.207 (0.080)	-0.385 (0.091)	-0.411 (0.277)	-0.322 (0.269)	-0.287 (0.090)	-0.401 (0.122)	-0.136 (0.138)	-0.327 (0.087)	-0.303 (0.081)	-0.316 (0.107)	-0.306 (0.083)	-0.311 (0.110)	-0.202 (0.091)	-0.467 (0.090)
MaxT	-0.195 (0.085)	-0.336 (0.140)	-0.356 (0.248)	-0.265 (0.252)	-0.287 (0.104)	-0.249 (0.154)	-0.122 (0.126)	-0.299 (0.112)	-0.265 (0.102)	-0.306 (0.129)	-0.268 (0.105)	-0.303 (0.131)	-0.203 (0.100)	-0.424 (0.143)
MinT †	-0.467* (0.244)	-0.060 (0.277)	-0.118 (0.326)	0.009 (0.246)	-0.402 (0.188)	0.561 (0.365)	-0.479* (0.262)	-0.298 (0.203)	-0.284 (0.236)	-0.365* (0.197)	-0.383* (0.223)	-0.206 (0.210)	-0.389 (0.178)	-0.170 (0.312)
Drought	-0.498* (0.262)	-0.486 (0.296)	-0.310 (0.358)	-0.109 (0.311)	-0.212 (0.295)	-0.799* (0.419)	-0.023 (0.393)	-0.337 (0.284)	-0.313 (0.267)	-0.297 (0.318)	-0.301 (0.265)	-0.316 (0.328)	-0.197 (0.265)	-0.468 (0.352)
Prec	-0.138 (0.257)	-0.668 (0.288)	0.021 (0.436)	0.029 (0.296)	-0.430* (0.238)	-0.651* (0.368)	-0.189 (0.388)	-0.500 (0.234)	-0.468* (0.250)	-0.472* (0.241)	-0.461* (0.247)	-0.483* (0.263)	-0.249 (0.232)	-0.841 (0.292)
Wind	-0.197 (0.086)	-0.324 (0.102)	-0.143 (0.148)	-0.058 (0.141)	-0.237 (0.098)	-0.457 (0.135)	-0.145 (0.105)	-0.281 (0.103)	-0.269 (0.087)	-0.266 (0.122)	-0.260 (0.084)	-0.281 (0.128)	-0.211 (0.101)	-0.341 (0.117)
Fire	-0.328 (0.140)	-0.555 (0.151)	-0.524 (0.430)	-0.400 (0.443)	-0.411 (0.157)	-0.652 (0.212)	-0.193 (0.202)	-0.480 (0.156)	-0.476 (0.145)	-0.415 (0.183)	-0.480 (0.139)	-0.407 (0.196)	-0.279* (0.157)	-0.702 (0.162)
Hail	0.337 (0.137)	0.749 (0.199)	0.601* (0.339)	0.656 (0.229)	0.485 (0.170)	0.572 (0.248)	0.008 (0.298)	0.551 (0.161)	0.463 (0.174)	0.565 (0.164)	0.422 (0.153)	0.636 (0.200)	0.234 (0.146)	0.889 (0.226)

Panel G: labor productivity – output per hour worked (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.224 (0.072)	-0.385 (0.070)	-0.296 (0.218)	-0.244 (0.198)	-0.273 (0.063)	-0.483 (0.114)	-0.141 (0.145)	-0.325 (0.053)	-0.310 (0.070)	-0.293 (0.064)	-0.303 (0.069)	-0.305 (0.074)	-0.208 (0.067)	-0.479 (0.062)
MaxT	-0.193 (0.081)	-0.341 (0.093)	-0.246 (0.203)	-0.202 (0.196)	-0.258 (0.075)	-0.344 (0.132)	-0.115 (0.135)	-0.289 (0.072)	-0.268 (0.082)	-0.268 (0.078)	-0.262 (0.081)	-0.282 (0.088)	-0.189 (0.072)	-0.454 (0.096)
MinT †	-0.345 (0.221)	0.053 (0.274)	-0.027 (0.309)	0.133 (0.257)	-0.291* (0.168)	0.411 (0.443)	-0.373 (0.231)	-0.225 (0.182)	-0.277 (0.205)	-0.187 (0.189)	-0.344* (0.192)	-0.027 (0.227)	-0.287* (0.157)	-0.147 (0.277)
Drought	-0.281 (0.226)	-0.167 (0.285)	0.048 (0.281)	0.227 (0.227)	-0.003 (0.224)	-0.607 (0.563)	0.021 (0.439)	-0.105 (0.230)	-0.136 (0.242)	-0.028 (0.274)	-0.154 (0.229)	0.028 (0.323)	-0.075 (0.225)	-0.118 (0.332)
Prec	-0.289 (0.207)	-0.814 (0.256)	-0.267 (0.350)	-0.294 (0.287)	-0.536 (0.169)	-0.754* (0.451)	-0.240 (0.321)	-0.610 (0.184)	-0.548 (0.202)	-0.601 (0.213)	-0.519 (0.189)	-0.671 (0.236)	-0.354 (0.175)	-0.966 (0.267)

Wind	-0.127 (0.083)	-0.270 (0.100)	-0.085 (0.114)	-0.003 (0.104)	-0.180 (0.072)	-0.400 (0.164)	-0.090 (0.161)	-0.221 (0.066)	-0.211 (0.079)	-0.201 (0.077)	-0.187 (0.075)	-0.245 (0.087)	-0.159* (0.082)	-0.272 (0.098)
Fire	-0.351 (0.111)	-0.476 (0.119)	-0.424 (0.319)	-0.361 (0.291)	-0.401 (0.100)	-0.542 (0.229)	-0.181 (0.218)	-0.449 (0.095)	-0.468 (0.114)	-0.348 (0.111)	-0.449 (0.110)	-0.363 (0.129)	-0.288 (0.110)	-0.645 (0.126)
Hail	0.312 (0.117)	0.568 (0.176)	0.233 (0.287)	0.366 (0.165)	0.356 (0.121)	0.562* (0.329)	-0.003 (0.283)	0.436 (0.130)	0.354 (0.147)	0.452 (0.146)	0.360 (0.121)	0.458 (0.188)	0.206 (0.127)	0.693 (0.212)

Panel H: real product wage (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.172 (0.063)	-0.365 (0.119)	-0.135 (0.188)	-0.167 (0.164)	-0.156 (0.070)	-0.777 (0.166)	-0.021 (0.201)	-0.275 (0.076)	-0.295 (0.080)	-0.161* (0.092)	-0.267 (0.065)	-0.213 (0.104)	-0.150 (0.050)	-0.424 (0.136)
MaxT	-0.176 (0.071)	-0.377 (0.108)	-0.280 (0.190)	-0.291 (0.178)	-0.176 (0.065)	-0.685 (0.199)	-0.053 (0.169)	-0.261 (0.069)	-0.274 (0.077)	-0.170* (0.087)	-0.246 (0.062)	-0.222 (0.096)	-0.146 (0.048)	-0.449 (0.137)
MinT †	-0.204 (0.225)	-0.004 (0.337)	0.252 (0.275)	0.194 (0.244)	-0.118 (0.189)	0.169 (0.699)	-0.271 (0.459)	-0.082 (0.191)	-0.128 (0.218)	-0.052 (0.234)	-0.037 (0.182)	-0.218 (0.273)	-0.117 (0.126)	-0.063 (0.394)
Drought	-0.288 (0.243)	-0.567 (0.276)	-0.100 (0.290)	-0.147 (0.252)	-0.211 (0.222)	-1.352* (0.720)	-0.797 (0.495)	-0.317 (0.209)	-0.414 (0.303)	-0.281 (0.255)	-0.402 (0.249)	-0.296 (0.285)	-0.171 (0.211)	-0.683* (0.397)
Prec	-0.254 (0.111)	-0.398 (0.314)	-0.074 (0.233)	0.045 (0.246)	-0.151 (0.127)	-0.971 (0.737)	0.319 (0.400)	-0.334* (0.187)	-0.376 (0.151)	-0.081 (0.267)	-0.325 (0.143)	-0.163 (0.271)	-0.213* (0.113)	-0.372 (0.377)
Wind	-0.174 (0.088)	-0.152 (0.105)	-0.070 (0.114)	-0.064 (0.104)	-0.132* (0.068)	-0.340 (0.235)	-0.114 (0.216)	-0.158 (0.076)	-0.156* (0.090)	-0.151* (0.088)	-0.170 (0.077)	-0.126 (0.096)	-0.166 (0.081)	-0.137 (0.135)
Fire	-0.194* (0.108)	-0.557 (0.150)	-0.117 (0.230)	-0.199 (0.186)	-0.231 (0.099)	-1.125 (0.269)	-0.124 (0.320)	-0.383 (0.099)	-0.465 (0.123)	-0.171 (0.127)	-0.409 (0.102)	-0.262* (0.146)	-0.170 (0.084)	-0.670 (0.173)
Hail	0.224 (0.105)	0.892 (0.182)	0.397 (0.150)	0.414* (0.224)	0.289 (0.113)	1.347 (0.282)	-0.111 (0.272)	0.534 (0.098)	0.503 (0.110)	0.419 (0.184)	0.424 (0.091)	0.568 (0.217)	0.174* (0.105)	0.966 (0.206)

Panel I: real consumption wage (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.172 (0.074)	-0.236 (0.153)	-0.125 (0.201)	-0.146 (0.188)	-0.066 (0.088)	-0.779 (0.219)	-0.158 (0.060)	-0.162 (0.103)	-0.211 (0.102)	-0.075 (0.112)	-0.199 (0.082)	-0.096 (0.136)	-0.111* (0.062)	-0.251 (0.194)
MaxT	-0.170 (0.082)	-0.226 (0.147)	-0.315* (0.191)	-0.349* (0.204)	-0.079 (0.081)	-0.602 (0.302)	-0.124* (0.067)	-0.133 (0.091)	-0.151* (0.091)	-0.098 (0.106)	-0.145* (0.077)	-0.108 (0.128)	-0.090 (0.061)	-0.228 (0.192)
MinT †	-0.219 (0.258)	0.246 (0.401)	0.369 (0.302)	0.389 (0.316)	0.036 (0.233)	0.983 (0.715)	-0.049 (0.180)	0.109 (0.236)	0.091 (0.238)	0.099 (0.268)	0.128 (0.205)	0.030 (0.321)	0.004 (0.145)	0.297 (0.499)
Drought	-0.228 (0.254)	-0.518 (0.364)	-0.043 (0.275)	-0.209 (0.313)	-0.283 (0.269)	-0.958 (0.780)	-0.261 (0.238)	-0.387 (0.276)	-0.395 (0.331)	-0.341 (0.283)	-0.377 (0.287)	-0.371 (0.356)	-0.239 (0.224)	-0.600 (0.497)
Prec	-0.262 (0.121)	-0.237 (0.328)	-0.145 (0.259)	0.078 (0.236)	-0.007 (0.150)	-1.057 (0.805)	-0.206 (0.216)	-0.147 (0.182)	-0.298* (0.178)	0.103 (0.252)	-0.257 (0.160)	0.046 (0.297)	-0.135 (0.138)	-0.186 (0.396)
Wind	-0.195* (0.106)	-0.132 (0.140)	-0.094 (0.134)	-0.052 (0.128)	-0.103 (0.091)	-0.481* (0.281)	-0.226* (0.117)	-0.133 (0.101)	-0.171 (0.111)	-0.095 (0.102)	-0.188* (0.098)	-0.067 (0.127)	-0.159 (0.100)	-0.118 (0.179)
Fire	-0.192 (0.119)	-0.419 (0.187)	-0.145 (0.249)	-0.235 (0.228)	-0.111 (0.126)	-1.205 (0.294)	-0.174* (0.102)	-0.268* (0.138)	-0.369 (0.141)	-0.073 (0.159)	-0.328 (0.115)	-0.136 (0.194)	-0.111 (0.103)	-0.500 (0.250)
Hail	0.164 (0.114)	0.694 (0.215)	0.374 (0.174)	0.433 (0.290)	0.191 (0.146)	1.202 (0.316)	-0.016 (0.154)	0.402 (0.134)	0.388 (0.125)	0.316 (0.216)	0.318 (0.107)	0.449 (0.283)	0.147 (0.124)	0.719 (0.249)

Panel L: real wage wedge (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.029 (0.053)	0.045 (0.058)	0.014 (0.111)	-0.008 (0.098)	0.029 (0.032)	-0.026 (0.104)	-0.110 (0.211)	0.036 (0.042)	0.003 (0.040)	0.054 (0.052)	0.002 (0.045)	0.056 (0.056)	0.001 (0.043)	0.055 (0.066)
MaxT	-0.016 (0.044)	0.047 (0.069)	-0.026 (0.104)	-0.078 (0.100)	0.036 (0.029)	0.013 (0.146)	-0.041 (0.180)	0.043 (0.041)	0.028 (0.035)	0.045 (0.048)	0.024 (0.038)	0.053 (0.055)	0.024 (0.035)	0.054 (0.077)
MinT †	-0.024 (0.129)	0.194 (0.167)	0.223 (0.171)	0.131 (0.115)	0.083 (0.066)	0.675 (0.301)	0.112 (0.449)	0.119 (0.091)	0.133 (0.088)	0.092 (0.110)	0.103 (0.099)	0.147 (0.132)	0.052 (0.082)	0.270 (0.199)
Drought	0.091 (0.118)	0.137 (0.158)	0.219 (0.152)	0.041 (0.181)	-0.008 (0.109)	0.336 (0.214)	0.592 (0.462)	-0.022 (0.129)	0.058 (0.101)	0.005 (0.166)	0.058 (0.106)	0.002 (0.171)	-0.046 (0.089)	0.177 (0.176)
Prec	-0.088 (0.134)	-0.023 (0.137)	-0.195 (0.175)	-0.127 (0.111)	0.046 (0.084)	-0.314 (0.270)	-0.638 (0.451)	0.065 (0.084)	-0.065 (0.105)	0.101 (0.131)	-0.056 (0.112)	0.091 (0.149)	0.016 (0.111)	-0.041 (0.159)
Wind	-0.029 (0.037)	0.008 (0.053)	-0.010 (0.060)	0.028 (0.060)	0.021 (0.039)	-0.169 (0.107)	-0.140 (0.159)	0.017 (0.048)	-0.029 (0.038)	0.052 (0.055)	0.046 (0.043)	0.046 (0.060)	-0.003 (0.036)	0.007 (0.064)
Fire	-0.031 (0.071)	0.031 (0.069)	0.066 (0.142)	-0.005 (0.159)	0.039 (0.046)	-0.113 (0.149)	0.005 (0.332)	0.020 (0.054)	0.001 (0.061)	0.048 (0.072)	-0.000 (0.064)	0.052 (0.082)	0.013 (0.058)	0.027 (0.088)
Hail	-0.020 (0.071)	-0.040 (0.082)	-0.055 (0.122)	0.080 (0.104)	-0.025 (0.068)	-0.005 (0.182)	0.065 (0.250)	-0.031 (0.064)	-0.021 (0.072)	-0.023 (0.094)	-0.022 (0.062)	-0.021 (0.102)	0.018 (0.070)	-0.086 (0.082)

Panel M: labor share (change)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	0.055 (0.094)	0.177 (0.139)	0.081 (0.201)	0.089 (0.186)	0.136 (0.101)	0.060 (0.248)	0.028 (0.301)	0.143 (0.089)	0.133 (0.107)	0.124 (0.106)	0.144 (0.100)	0.105 (0.131)	0.037 (0.086)	0.312* (0.163)
MaxT	0.035 (0.083)	0.139 (0.143)	-0.143 (0.248)	-0.114 (0.249)	0.124 (0.092)	-0.157 (0.332)	-0.041 (0.250)	0.132 (0.084)	0.103 (0.101)	0.125 (0.095)	0.118 (0.093)	0.099 (0.122)	0.042 (0.078)	0.284 (0.175)
MinT †	0.271 (0.250)	0.108 (0.500)	0.285 (0.318)	0.122 (0.380)	0.266 (0.288)	-1.152* (0.632)	0.215 (0.640)	0.228 (0.291)	0.198 (0.302)	0.275 (0.330)	0.325 (0.267)	0.054 (0.409)	0.270 (0.207)	0.131 (0.588)
Drought	-0.078 (0.264)	-0.206 (0.319)	0.006 (0.355)	-0.456 (0.305)	-0.222 (0.243)	-0.216 (1.096)	-1.064 (0.668)	-0.122 (0.215)	-0.249 (0.323)	-0.176 (0.216)	-0.175 (0.275)	-0.300 (0.345)	-0.204 (0.241)	-0.254 (0.370)
Prec	0.058 (0.246)	0.450 (0.298)	-0.026 (0.389)	0.321 (0.269)	0.327 (0.220)	0.201 (0.358)	0.544 (0.707)	0.289 (0.193)	0.331 (0.253)	0.290 (0.228)	0.285 (0.257)	0.372 (0.263)	0.099 (0.220)	0.770 (0.353)
Wind	-0.020 (0.089)	0.206* (0.111)	-0.040 (0.133)	-0.065 (0.129)	0.069 (0.092)	0.680 (0.312)	-0.015 (0.254)	0.106 (0.084)	0.103 (0.108)	0.077 (0.091)	0.063 (0.100)	0.141 (0.114)	-0.014 (0.091)	0.273 (0.127)
Fire	0.110 (0.137)	0.138 (0.229)	0.043 (0.285)	-0.014 (0.281)	0.164 (0.154)	-0.116 (0.491)	-0.087 (0.454)	0.166 (0.146)	0.135 (0.186)	0.146 (0.155)	0.180 (0.150)	0.069 (0.225)	0.039 (0.128)	0.319 (0.267)
Hail	-0.142 (0.130)	-0.060 (0.255)	-0.013 (0.307)	-0.272 (0.253)	-0.180 (0.091)	0.505 (0.548)	-0.008 (0.424)	-0.129 (0.121)	-0.104 (0.185)	-0.136 (0.134)	-0.210* (0.127)	0.056 (0.241)	-0.040 (0.125)	-0.274 (0.348)

Panel N: unemployment rate (change)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.002 (0.034)	-0.066* (0.034)	0.110 (0.082)	0.085 (0.081)	-0.035 (0.029)	-0.036 (0.052)	-0.007 (0.038)	-0.038 (0.028)	-0.019 (0.032)	-0.061* (0.033)	-0.012 (0.030)	-0.080 (0.036)	-0.026 (0.029)	-0.048 (0.036)
MaxT	-0.007 (0.031)	-0.082 (0.036)	0.032 (0.078)	0.020 (0.082)	-0.038 (0.027)	-0.055 (0.048)	-0.009 (0.035)	-0.044 (0.028)	-0.027 (0.030)	-0.063 (0.032)	-0.022 (0.029)	-0.080 (0.036)	-0.025 (0.026)	-0.069* (0.038)
MinT †	0.144* (0.079)	0.020 (0.085)	0.239 (0.113)	0.105 (0.107)	0.030 (0.065)	-0.014 (0.152)	0.072 (0.085)	0.021 (0.065)	0.038 (0.073)	0.010 (0.074)	0.039 (0.072)	0.003 (0.087)	0.042 (0.065)	-0.003 (0.088)
Drought	-0.095 (0.097)	-0.155 (0.097)	-0.055 (0.118)	-0.178 (0.114)	-0.098 (0.076)	-0.153 (0.147)	-0.080 (0.113)	-0.110 (0.074)	-0.068 (0.093)	-0.166* (0.092)	-0.062 (0.088)	-0.194* (0.105)	-0.108 (0.069)	-0.104 (0.123)
Prec	0.028 (0.081)	-0.103 (0.100)	0.174 (0.121)	0.211 (0.094)	-0.010 (0.063)	-0.124 (0.165)	-0.014 (0.093)	-0.030 (0.066)	-0.028 (0.086)	-0.029 (0.086)	-0.008 (0.084)	-0.066 (0.098)	0.003 (0.060)	-0.074 (0.109)
Wind	-0.017 (0.032)	-0.046 (0.041)	-0.007 (0.042)	-0.026 (0.039)	-0.043 (0.032)	0.016 (0.059)	0.004 (0.039)	-0.039 (0.034)	-0.008 (0.037)	-0.077* (0.040)	-0.003 (0.034)	-0.093* (0.048)	-0.046* (0.028)	-0.021 (0.047)
Fire	-0.006 (0.051)	-0.082 (0.054)	0.015 (0.106)	-0.020 (0.109)	-0.053 (0.048)	-0.033 (0.067)	0.001 (0.056)	-0.055 (0.045)	-0.016 (0.053)	-0.102 (0.049)	-0.006 (0.048)	-0.133 (0.055)	-0.045 (0.046)	-0.056 (0.060)
Hail	0.012 (0.051)	0.131 (0.057)	0.064 (0.090)	0.002 (0.083)	0.063 (0.045)	0.060 (0.093)	-0.009 (0.067)	0.070 (0.044)	0.048 (0.055)	0.087 (0.079)	0.042 (0.053)	0.102 (0.088)	0.004 (0.046)	0.147 (0.067)

Panel O: labor force (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	0.035 (0.040)	0.014 (0.045)	-0.056 (0.125)	-0.095 (0.150)	0.015 (0.039)	0.062 (0.071)	0.000 (0.046)	0.025 (0.036)	0.045 (0.034)	-0.016 (0.048)	0.027 (0.030)	0.013 (0.057)	0.024 (0.040)	0.019 (0.045)
MaxT	0.044 (0.040)	-0.017 (0.049)	-0.054 (0.119)	-0.096 (0.145)	0.015 (0.042)	-0.013 (0.073)	0.013 (0.046)	0.011 (0.039)	0.034 (0.034)	-0.027 (0.050)	0.016 (0.030)	0.003 (0.063)	0.027 (0.041)	-0.016 (0.048)
MinT †	0.196 (0.091)	-0.024 (0.078)	0.064 (0.099)	-0.056 (0.098)	0.085 (0.059)	-0.156 (0.170)	0.065 (0.091)	0.067 (0.055)	0.085 (0.072)	0.038 (0.068)	0.072 (0.061)	0.056 (0.075)	0.116* (0.066)	-0.029 (0.089)
Drought	0.093 (0.119)	0.046 (0.153)	-0.035 (0.125)	0.097 (0.161)	0.006 (0.114)	0.394 (0.191)	0.134 (0.142)	0.057 (0.100)	0.121 (0.093)	-0.020 (0.127)	0.087 (0.073)	0.022 (0.173)	0.045 (0.107)	0.092 (0.160)
Prec	-0.023 (0.103)	0.040 (0.121)	-0.021 (0.118)	-0.171 (0.137)	-0.006 (0.085)	0.044 (0.188)	-0.052 (0.118)	0.008 (0.079)	0.015 (0.079)	-0.019 (0.099)	0.005 (0.069)	-0.004 (0.116)	-0.008 (0.092)	0.017 (0.119)
Wind	0.019 (0.050)	0.001 (0.055)	-0.015 (0.056)	-0.021 (0.076)	0.006 (0.052)	0.028 (0.067)	-0.043 (0.062)	0.015 (0.049)	0.028 (0.045)	-0.019 (0.058)	0.016 (0.038)	-0.002 (0.070)	0.016 (0.052)	0.001 (0.053)
Fire	0.040 (0.073)	0.033 (0.069)	0.068 (0.187)	0.047 (0.224)	0.019 (0.067)	0.117 (0.111)	0.034 (0.081)	0.034 (0.057)	0.081 (0.056)	-0.036 (0.072)	0.041 (0.048)	0.022 (0.089)	0.023 (0.071)	0.049 (0.070)
Hail	0.018 (0.055)	0.016 (0.116)	0.059 (0.144)	0.177 (0.163)	0.015 (0.059)	0.011 (0.197)	-0.053 (0.083)	0.022 (0.063)	-0.014 (0.051)	0.061 (0.082)	0.025 (0.043)	-0.007 (0.107)	0.031 (0.051)	-0.009 (0.117)

Panel P: entry margin (excess labor force growth over employment growth)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.002 (0.037)	-0.077* (0.040)	0.119 (0.093)	0.094 (0.093)	-0.039 (0.033)	-0.046 (0.060)	-0.007 (0.041)	-0.044 (0.032)	-0.022 (0.035)	-0.071* (0.038)	-0.014 (0.033)	-0.092 (0.043)	-0.030 (0.032)	-0.057 (0.042)
MaxT	-0.008 (0.034)	-0.095 (0.042)	0.035 (0.089)	0.024 (0.095)	-0.044 (0.030)	-0.063 (0.056)	-0.010 (0.037)	-0.051 (0.031)	-0.031 (0.033)	-0.072* (0.037)	-0.025 (0.032)	-0.091 (0.043)	-0.029 (0.028)	-0.078* (0.045)
MinT †	0.159* (0.086)	0.030 (0.101)	0.266 (0.127)	0.119 (0.125)	0.035 (0.073)	0.001 (0.177)	0.077 (0.091)	0.027 (0.074)	0.046 (0.082)	0.013 (0.087)	0.042 (0.079)	0.015 (0.103)	0.047 (0.071)	0.005 (0.104)

Drought	-0.103 (0.105)	-0.181 (0.112)	-0.054 (0.132)	-0.208 (0.129)	-0.111 (0.082)	-0.179 (0.175)	-0.085 (0.123)	-0.126 (0.082)	-0.074 (0.103)	-0.193* (0.108)	-0.067 (0.097)	-0.226* (0.124)	-0.122* (0.074)	-0.120 (0.143)
Prec	0.031 (0.088)	-0.117 (0.117)	0.189 (0.137)	0.247 (0.107)	-0.011 (0.069)	-0.146 (0.192)	-0.018 (0.100)	-0.035 (0.076)	-0.034 (0.097)	-0.031 (0.103)	-0.013 (0.094)	-0.071 (0.120)	0.002 (0.066)	-0.085 (0.128)
Wind	-0.019 (0.034)	-0.057 (0.048)	-0.009 (0.047)	-0.030 (0.044)	-0.049 (0.035)	0.006 (0.071)	0.008 (0.043)	-0.047 (0.038)	-0.009 (0.040)	-0.092* (0.047)	-0.003 (0.037)	-0.111 (0.056)	-0.053* (0.030)	-0.027 (0.055)
Fire	-0.007 (0.056)	-0.095 (0.063)	0.009 (0.121)	-0.031 (0.125)	-0.061 (0.053)	-0.040 (0.075)	0.001 (0.060)	-0.064 (0.051)	-0.018 (0.059)	-0.117 (0.058)	-0.008 (0.052)	-0.153 (0.066)	-0.052 (0.050)	-0.065 (0.069)
Hail	0.013 (0.057)	0.154 (0.068)	0.080 (0.102)	0.010 (0.094)	0.076 (0.052)	0.066 (0.107)	-0.004 (0.074)	0.082 (0.051)	0.059 (0.063)	0.099 (0.097)	0.051 (0.061)	0.118 (0.108)	0.007 (0.054)	0.172 (0.079)

The table reports estimates from asymmetric dynamic panel regressions. All specifications include Autometrics-selected country fixed effects and macro-financial controls for economic uncertainty, geopolitical risk, financial stress and business cycle conditions. The conditioning variable is relative climate risk (Median/IQR), computed from the E3CI composite index and from each of its components. It is interacted with pairs of dummies partitioning countries according to whether they stand above or below the annual cross-country mean of the Notre Dame Global Adaptation Index (Adaptation), of the CCPI-mm mitigation index (Mitigation), of real per capita GDP (Income) and of average temperature (Temperature), and, in addition, according to EU membership (Institutions) and geographical position (Latitude: North/South; Longitude: West/East). Coefficients are scaled by the pooled standard deviation of the annual within-country change of the underlying series, so that they measure the impact of a typical annual change. The climate measures are Melly-Pons FE. Bold figures denote significance at the 10% level or better; an asterisk marks significance at 10% but not 5%.

Table A7-A: Dynamic panel regressions with GETS-Autometrics country fixed effects and macro-fin control variables: Asymmetric models, climate uncertainty (IQR) (per-country GETS measures)

Panel A: real GDP growth rate														
	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.168 (0.120)	-0.221 (0.176)	-0.242 (0.443)	-0.254 (0.496)	-0.227 (0.180)	-0.222 (0.170)	-0.067 (0.135)	-0.244 (0.178)	-0.207 (0.139)	-0.256 (0.212)	-0.245 (0.125)	-0.195 (0.248)	-0.188 (0.180)	-0.289* (0.168)
MaxT	-0.103 (0.080)	-0.124 (0.087)	-0.389 (0.196)	-0.459 (0.169)	-0.126 (0.078)	-0.104 (0.142)	-0.057 (0.114)	-0.131* (0.077)	-0.119 (0.076)	-0.131 (0.084)	-0.135* (0.074)	-0.105 (0.095)	-0.092 (0.080)	-0.182 (0.088)
MinT	0.410 (0.344)	0.258 (0.418)	0.411 (0.720)	0.450 (0.738)	0.385 (0.333)	0.048 (0.422)	0.363 (0.297)	0.320 (0.335)	0.297 (0.338)	0.364 (0.334)	0.394 (0.330)	0.199 (0.363)	0.336 (0.327)	0.298 (0.415)
Drought	-0.405 (0.520)	-0.490 (0.503)	-0.268 (0.645)	-0.068 (0.669)	-0.404 (0.535)	-0.643 (0.578)	-0.120 (0.481)	-0.473 (0.517)	-0.381 (0.491)	-0.528 (0.547)	-0.478 (0.482)	-0.378 (0.602)	-0.452 (0.531)	-0.420 (0.547)
Prec	-0.341* (0.206)	-0.356 (0.254)	-0.859 (0.430)	-0.935 (0.406)	-0.364* (0.188)	-0.248 (0.395)	-0.324 (0.235)	-0.353* (0.210)	-0.331* (0.198)	-0.381* (0.229)	-0.378* (0.197)	-0.306 (0.246)	-0.305 (0.196)	-0.427* (0.258)
Wind	-0.781 (0.356)	-0.906* (0.490)	-1.230 (0.524)	-1.225 (0.541)	-0.766 (0.386)	-0.847 (0.634)	-0.547 (0.405)	-0.804* (0.418)	-0.706* (0.367)	-0.900* (0.489)	-0.763 (0.362)	-0.805 (0.521)	-0.693* (0.392)	-0.894* (0.474)
Fire	-0.243 (0.168)	-0.269 (0.217)	-0.153 (0.523)	-0.087 (0.575)	-0.257 (0.228)	-0.403* (0.238)	-0.151 (0.185)	-0.289 (0.227)	-0.298 (0.185)	-0.241 (0.265)	-0.362 (0.163)	-0.142 (0.311)	-0.205 (0.241)	-0.370* (0.203)
Hail	-0.795 (0.316)	-0.791* (0.446)	-0.947 (0.631)	-0.766 (0.695)	-0.731* (0.409)	-0.742 (0.559)	-0.516 (0.262)	-0.756* (0.433)	-0.652* (0.363)	-0.857* (0.491)	-0.785 (0.343)	-0.649 (0.560)	-0.702* (0.417)	-0.776* (0.454)

Panel B: real consumption growth rate														
	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.232 (0.185)	-0.230 (0.151)	-0.236 (0.568)	-0.198 (0.500)	-0.213 (0.190)	-0.264 (0.213)	-0.131 (0.251)	-0.230 (0.162)	-0.192 (0.164)	-0.265 (0.192)	-0.235 (0.148)	-0.196 (0.223)	-0.201 (0.227)	-0.252* (0.138)
MaxT	-0.155* (0.090)	-0.218 (0.082)	-0.575 (0.196)	-0.637 (0.168)	-0.150* (0.079)	-0.216 (0.159)	-0.061 (0.105)	-0.169 (0.073)	-0.143* (0.086)	-0.183 (0.079)	-0.158* (0.083)	-0.158* (0.089)	-0.120 (0.085)	-0.231 (0.090)
MinT	0.423 (0.337)	0.216 (0.459)	0.440 (0.691)	0.417 (0.735)	0.334 (0.329)	-0.038 (0.514)	0.178 (0.367)	0.276 (0.322)	0.299 (0.308)	0.218 (0.375)	0.333 (0.307)	0.151 (0.395)	0.294 (0.339)	0.211 (0.435)
Drought	-0.265 (0.602)	-0.102 (0.559)	0.018 (0.762)	0.268 (0.705)	-0.207 (0.592)	-0.209 (0.776)	-0.210 (0.691)	-0.207 (0.530)	-0.210 (0.534)	-0.203 (0.585)	-0.266 (0.508)	-0.114 (0.653)	-0.255 (0.636)	-0.137 (0.561)
Prec	-0.508 (0.221)	-0.392 (0.244)	-1.151 (0.473)	-1.181 (0.470)	-0.380* (0.195)	-0.418 (0.430)	-0.410* (0.245)	-0.382 (0.193)	-0.412 (0.192)	-0.340 (0.224)	-0.461 (0.182)	-0.258 (0.246)	-0.375* (0.214)	-0.400 (0.252)
Wind	-1.007 (0.411)	-0.726 (0.458)	-1.199* (0.640)	-1.208 (0.605)	-0.730* (0.380)	-1.134 (0.738)	-1.186 (0.507)	-0.752 (0.374)	-0.916 (0.353)	-0.594 (0.455)	-0.981 (0.329)	-0.499 (0.497)	-0.829* (0.429)	-0.748* (0.430)
Fire	-0.282 (0.244)	-0.193 (0.199)	-0.152 (0.634)	-0.015 (0.571)	-0.195 (0.246)	-0.500 (0.330)	-0.120 (0.335)	-0.246 (0.218)	-0.264 (0.231)	-0.188 (0.236)	-0.327 (0.204)	-0.089 (0.280)	-0.192 (0.305)	-0.289 (0.202)
Hail	-0.824* (0.490)	-0.362 (0.467)	-0.699 (0.811)	-0.477 (0.725)	-0.532 (0.470)	-0.602 (0.714)	-0.848 (0.624)	-0.508 (0.434)	-0.621 (0.430)	-0.417 (0.514)	-0.744* (0.391)	-0.224 (0.587)	-0.632 (0.563)	-0.413 (0.430)

Panel C: real investment growth rate														
	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.185 (0.305)	-0.125 (0.313)	0.201 (0.735)	0.271 (0.740)	0.115 (0.247)	-0.946 (0.620)	-0.629 (0.653)	0.025 (0.229)	-0.144 (0.266)	0.126 (0.257)	-0.153 (0.269)	0.143 (0.281)	0.090 (0.304)	-0.248 (0.374)
MaxT	-0.205 (0.164)	-0.309 (0.206)	-0.733* (0.414)	-0.805* (0.414)	-0.037 (0.128)	-0.998 (0.399)	-0.032 (0.407)	-0.166 (0.122)	-0.213 (0.140)	-0.060 (0.127)	-0.197 (0.144)	-0.080 (0.144)	0.005 (0.157)	-0.439* (0.247)
MinT	0.896 (0.767)	0.390 (1.094)	-0.441 (1.663)	-1.110 (1.771)	0.072 (0.659)	1.178 (1.472)	2.409* (1.413)	0.060 (0.710)	0.486 (0.766)	-0.057 (0.665)	0.695 (0.739)	-0.465 (0.768)	0.305 (0.608)	0.211 (1.230)
Drought	0.043 (0.812)	0.773 (1.018)	0.803 (1.013)	1.500 (1.315)	0.619 (0.731)	0.071 (1.980)	-3.621 (1.779)	0.979 (0.765)	0.427 (0.948)	0.704 (0.821)	0.175 (0.964)	1.113 (1.018)	0.088 (0.820)	1.182 (1.312)
Prec	-0.542 (0.372)	-0.512 (0.512)	-0.800 (0.830)	-0.450 (0.911)	-0.129 (0.304)	-1.672* (0.943)	-0.685 (0.751)	-0.277 (0.294)	-0.465 (0.331)	-0.081 (0.294)	-0.551* (0.312)	0.064 (0.361)	-0.092 (0.344)	-0.691 (0.644)
Wind	-0.686 (0.460)	-0.586 (0.691)	-0.735 (0.845)	0.132 (0.766)	-0.303 (0.438)	-1.810 (1.557)	-2.113 (1.020)	-0.375 (0.438)	-0.732* (0.427)	-0.232 (0.592)	-1.046 (0.378)	0.248 (0.714)	-0.446 (0.572)	-0.675 (0.854)
Fire	-0.444 (0.383)	-0.188 (0.370)	0.016 (0.726)	0.389 (0.694)	0.007 (0.346)	-1.591 (0.785)	-1.352 (0.658)	-0.068 (0.313)	-0.451 (0.372)	0.188 (0.325)	-0.480 (0.353)	0.241 (0.373)	-0.093 (0.405)	-0.332 (0.426)
Hail	-0.763 (0.604)	0.201 (0.809)	-0.163 (0.831)	1.087 (0.926)	0.111 (0.601)	-0.874 (2.075)	-3.913 (1.227)	0.397 (0.584)	-0.308 (0.651)	0.417 (0.629)	-0.722 (0.626)	1.071 (0.814)	-0.311 (0.714)	0.373 (0.975)

Panel D: employed persons (growth rate)														
	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	0.113 (0.103)	0.131 (0.087)	0.094 (0.214)	0.066 (0.224)	0.084 (0.092)	0.208 (0.090)	0.091 (0.092)	0.102 (0.083)	0.114 (0.092)	0.081 (0.078)	0.093 (0.070)	0.116 (0.118)	0.096 (0.091)	0.110 (0.092)

MaxT	0.001 (0.043)	0.049 (0.048)	-0.204 (0.101)	-0.245 (0.107)	0.014 (0.035)	0.062 (0.084)	0.006 (0.041)	0.021 (0.033)	0.015 (0.038)	0.026 (0.036)	0.010 (0.033)	0.035 (0.046)	0.011 (0.035)	0.036 (0.047)
MinT	-0.269 (0.212)	-0.005 (0.252)	-0.465 (0.350)	-0.177 (0.370)	-0.005 (0.170)	0.204 (0.272)	-0.109 (0.165)	-0.132 (0.171)	-0.141 (0.185)	-0.111 (0.168)	-0.111 (0.167)	-0.203 (0.201)	-0.159 (0.154)	-0.070 (0.250)
Drought	0.567 (0.266)	0.245 (0.256)	0.466 (0.291)	0.438* (0.255)	0.390 (0.241)	0.327 (0.405)	0.413* (0.220)	0.378 (0.232)	0.472* (0.256)	0.242 (0.213)	0.376* (0.212)	0.390 (0.312)	0.425* (0.241)	0.316 (0.281)
Prec	0.028 (0.117)	0.022 (0.118)	-0.377* (0.210)	-0.489 (0.221)	0.033 (0.094)	-0.039 (0.161)	-0.059 (0.093)	0.033 (0.095)	0.010 (0.102)	0.048 (0.102)	-0.011 (0.087)	0.083 (0.126)	0.045 (0.089)	-0.011 (0.121)
Wind	0.035 (0.174)	-0.052 (0.255)	-0.130 (0.228)	-0.262 (0.310)	0.039 (0.185)	-0.170 (0.282)	-0.213 (0.197)	0.030 (0.190)	-0.026 (0.173)	0.058 (0.244)	-0.079 (0.149)	0.144 (0.286)	0.079 (0.164)	-0.095 (0.259)
Fire	0.131 (0.145)	0.139 (0.107)	0.084 (0.222)	0.071 (0.233)	0.107 (0.124)	0.290 (0.123)	0.116 (0.132)	0.131 (0.113)	0.138 (0.137)	0.115 (0.097)	0.101 (0.106)	0.173 (0.145)	0.138 (0.134)	0.117 (0.112)
Hail	0.301 (0.248)	0.085 (0.285)	0.123 (0.285)	0.090 (0.309)	0.216 (0.237)	0.045 (0.349)	0.046 (0.219)	0.210 (0.231)	0.208 (0.243)	0.170 (0.246)	0.125 (0.190)	0.304 (0.330)	0.283 (0.221)	0.065 (0.294)

Panel E: hours worked per employed person (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	0.030 (0.096)	0.005 (0.130)	-0.242 (0.287)	-0.229 (0.283)	-0.039 (0.139)	0.079 (0.097)	-0.004 (0.119)	-0.027 (0.131)	-0.026 (0.098)	-0.022 (0.182)	-0.016 (0.112)	-0.043 (0.169)	-0.030 (0.149)	-0.016 (0.098)
MaxT	0.026 (0.035)	0.017 (0.048)	-0.086 (0.109)	-0.088 (0.108)	-0.008 (0.047)	0.075 (0.064)	-0.001 (0.048)	0.001 (0.047)	-0.007 (0.039)	0.011 (0.060)	-0.004 (0.041)	0.009 (0.061)	-0.002 (0.051)	0.005 (0.040)
MinT	-0.007 (0.179)	0.077 (0.212)	0.117 (0.385)	0.016 (0.343)	0.073 (0.199)	0.136 (0.166)	0.061 (0.198)	0.086 (0.185)	0.075 (0.174)	0.096 (0.222)	0.075 (0.178)	0.102 (0.223)	0.101 (0.202)	0.041 (0.164)
Drought	-0.056 (0.235)	-0.224 (0.319)	-0.327 (0.332)	-0.179 (0.296)	-0.163 (0.326)	-0.296 (0.322)	-0.057 (0.272)	-0.195 (0.304)	-0.130 (0.241)	-0.258 (0.420)	-0.098 (0.273)	-0.343 (0.390)	-0.166 (0.356)	-0.203 (0.238)
Prec	-0.015 (0.111)	-0.007 (0.129)	-0.376 (0.302)	-0.404 (0.282)	-0.068 (0.140)	0.093 (0.147)	-0.046 (0.138)	-0.055 (0.139)	-0.061 (0.121)	-0.043 (0.169)	-0.059 (0.126)	-0.043 (0.168)	-0.073 (0.149)	-0.017 (0.120)
Wind	-0.281 (0.216)	-0.315 (0.272)	-0.589* (0.345)	-0.642* (0.337)	-0.328 (0.264)	-0.177 (0.272)	-0.184 (0.265)	-0.324 (0.259)	-0.279 (0.217)	-0.357 (0.335)	-0.273 (0.231)	-0.379 (0.327)	-0.312 (0.275)	-0.305 (0.238)
Fire	0.066 (0.120)	0.035 (0.158)	-0.165 (0.328)	-0.148 (0.328)	0.011 (0.169)	0.078 (0.159)	0.012 (0.146)	0.018 (0.164)	0.012 (0.125)	0.026 (0.221)	0.022 (0.141)	0.009 (0.207)	0.022 (0.190)	0.012 (0.126)
Hail	-0.165 (0.252)	-0.270 (0.330)	-0.526 (0.392)	-0.539 (0.398)	-0.255 (0.334)	-0.236 (0.340)	-0.122 (0.295)	-0.269 (0.320)	-0.206 (0.251)	-0.326 (0.432)	-0.190 (0.283)	-0.375 (0.399)	-0.250 (0.367)	-0.257 (0.250)

Panel F: labor productivity – output per worker (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.321 (0.079)	-0.482 (0.110)	-0.285 (0.287)	-0.181 (0.329)	-0.409 (0.110)	-0.514 (0.139)	-0.189 (0.139)	-0.452 (0.112)	-0.415 (0.088)	-0.441 (0.151)	-0.423 (0.087)	-0.429 (0.158)	-0.343 (0.114)	-0.567 (0.117)
MaxT	-0.150 (0.064)	-0.285 (0.070)	-0.299 (0.149)	-0.260 (0.101)	-0.211 (0.058)	-0.247 (0.092)	-0.107 (0.106)	-0.228 (0.057)	-0.205 (0.060)	-0.232 (0.064)	-0.213 (0.059)	-0.220 (0.071)	-0.148 (0.060)	-0.356 (0.070)
MinT	0.640 (0.270)	0.334 (0.363)	0.477 (0.503)	0.283 (0.503)	0.679 (0.258)	-0.101 (0.350)	0.500* (0.277)	0.545 (0.275)	0.551 (0.278)	0.526* (0.282)	0.567 (0.278)	0.494* (0.285)	0.561 (0.254)	0.498 (0.371)
Drought	-0.849* (0.435)	-0.726* (0.428)	-0.345 (0.487)	-0.152 (0.461)	-0.798* (0.436)	-0.884* (0.484)	-0.444 (0.512)	-0.849 (0.424)	-0.860 (0.414)	-0.735 (0.460)	-0.821 (0.418)	-0.794* (0.458)	-0.848 (0.405)	-0.755 (0.489)
Prec	-0.453 (0.158)	-0.539 (0.188)	-0.629 (0.284)	-0.505 (0.232)	-0.534 (0.134)	-0.294 (0.263)	-0.349 (0.227)	-0.521 (0.151)	-0.471 (0.152)	-0.556 (0.163)	-0.485 (0.160)	-0.535 (0.157)	-0.443 (0.143)	-0.613 (0.195)
Wind	-0.803 (0.236)	-0.940 (0.311)	-0.926 (0.364)	-0.789 (0.304)	-0.889 (0.262)	-0.624 (0.487)	-0.378 (0.353)	-0.898 (0.289)	-0.741 (0.265)	-1.021 (0.319)	-0.707 (0.268)	-1.068 (0.316)	-0.794 (0.285)	-0.918 (0.341)
Fire	-0.429 (0.113)	-0.509 (0.139)	-0.192 (0.363)	-0.038 (0.380)	-0.454 (0.146)	-0.786 (0.210)	-0.317* (0.180)	-0.516 (0.151)	-0.532 (0.123)	-0.443 (0.195)	-0.550 (0.117)	-0.412 (0.206)	-0.408 (0.155)	-0.618 (0.146)
Hail	-1.009 (0.188)	-0.910 (0.285)	-0.743* (0.407)	-0.532 (0.421)	-1.029 (0.240)	-0.695 (0.498)	-0.565* (0.298)	-1.030 (0.279)	-0.935 (0.239)	-1.058 (0.340)	-0.937 (0.244)	-1.056 (0.339)	-1.010 (0.238)	-0.946 (0.357)

Panel G: labor productivity – output per hour worked (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.293 (0.088)	-0.396 (0.106)	0.041 (0.220)	0.088 (0.224)	-0.333 (0.092)	-0.504 (0.168)	-0.148 (0.207)	-0.383 (0.074)	-0.378 (0.100)	-0.319 (0.090)	-0.378 (0.098)	-0.308 (0.113)	-0.291 (0.095)	-0.486 (0.113)
MaxT	-0.167 (0.057)	-0.280 (0.051)	-0.272 (0.115)	-0.249 (0.082)	-0.204 (0.040)	-0.288 (0.088)	-0.097 (0.100)	-0.229 (0.035)	-0.211 (0.050)	-0.217 (0.038)	-0.210 (0.046)	-0.221 (0.047)	-0.150 (0.043)	-0.365 (0.052)
MinT	0.421 (0.257)	0.027 (0.359)	0.214 (0.448)	0.115 (0.394)	0.423 (0.210)	-0.277 (0.428)	0.287 (0.264)	0.322 (0.239)	0.385 (0.238)	0.210 (0.256)	0.406* (0.237)	0.113 (0.277)	0.326 (0.209)	0.300 (0.364)
Drought	-0.488 (0.371)	-0.076 (0.402)	0.291 (0.374)	0.314 (0.326)	-0.331 (0.329)	-0.229 (0.646)	-0.182 (0.570)	-0.334 (0.319)	-0.483 (0.356)	-0.075 (0.334)	-0.493 (0.352)	0.018 (0.374)	-0.430 (0.325)	-0.142 (0.445)
Prec	-0.328 (0.162)	-0.487 (0.150)	-0.259 (0.292)	-0.137 (0.256)	-0.400 (0.121)	-0.538* (0.279)	-0.231 (0.246)	-0.436 (0.110)	-0.402 (0.138)	-0.429 (0.118)	-0.402 (0.135)	-0.435 (0.129)	-0.322 (0.126)	-0.604 (0.157)

Wind	-0.222 (0.234)	-0.477* (0.259)	-0.113 (0.282)	0.089 (0.241)	-0.304 (0.199)	-0.644 (0.475)	0.058 (0.435)	-0.398 (0.189)	-0.264 (0.213)	-0.479 (0.220)	-0.269 (0.202)	-0.502 (0.241)	-0.251 (0.235)	-0.491* (0.265)
Fire	-0.406 (0.111)	-0.399 (0.112)	-0.060 (0.218)	0.040 (0.218)	-0.395 (0.103)	-0.658 (0.249)	-0.267 (0.245)	-0.442 (0.088)	-0.505 (0.119)	-0.305 (0.105)	-0.497 (0.115)	-0.283 (0.132)	-0.361 (0.118)	-0.519 (0.117)
Hail	-0.472* (0.255)	-0.322 (0.315)	0.060 (0.333)	0.273 (0.321)	-0.448 (0.218)	-0.528 (0.611)	-0.187 (0.502)	-0.490 (0.215)	-0.505 (0.254)	-0.387 (0.270)	-0.533 (0.250)	-0.314 (0.320)	-0.487 (0.241)	-0.414 (0.338)

Panel H: real product wage (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
	(0.100)	(0.138)	(0.239)	(0.217)	(0.089)	(0.342)	(0.231)	(0.090)	(0.124)	(0.100)	(0.098)	(0.112)	(0.066)	(0.184)
E3CI	-0.270	-0.473	-0.175	-0.184	-0.253	-0.953	-0.299	-0.344	-0.386	-0.256	-0.366	-0.289	-0.237	-0.545
MaxT	-0.123	-0.246	-0.058	-0.066	-0.112	-0.547	0.011	-0.177	-0.189	-0.098	-0.161	-0.149*	-0.099	-0.298
MinT	0.391	0.367	0.570	0.532*	0.312	0.079	0.558	0.249	0.297	0.247	0.279	0.278	0.243	0.369
Drought	-0.576	-0.864	-0.432	-0.345	-0.575	-1.321	-1.684	-0.551	-0.683*	-0.633	-0.734	-0.542*	-0.509	-0.927*
Prec	-0.318	-0.341	-0.079	-0.064	-0.231	-0.660	0.033	-0.303	-0.261	-0.278*	-0.252	-0.295*	-0.244	-0.317
Wind	-0.517	-0.511*	-0.305	-0.247	-0.366	-0.930	-0.077	-0.474	-0.302	-0.673	-0.348*	-0.582	-0.449	-0.408
Fire	-0.294	-0.440	-0.087	-0.027	-0.247*	-1.407	-0.389	-0.348	-0.458	-0.177	-0.420	-0.240	-0.249	-0.527
Hail	-0.612	-0.625*	-0.264	-0.246	-0.475	-1.240	-0.938	-0.510	-0.485	-0.671	-0.523*	-0.608	-0.521	-0.608
	(0.289)	(0.322)	(0.331)	(0.285)	(0.232)	(0.939)	(0.579)	(0.225)	(0.343)	(0.190)	(0.295)	(0.239)	(0.204)	(0.460)

Panel I: real consumption wage (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
	(0.113)	(0.180)	(0.245)	(0.273)	(0.121)	(0.381)	(0.070)	(0.132)	(0.146)	(0.126)	(0.118)	(0.161)	(0.081)	(0.260)
E3CI	-0.272	-0.335*	-0.209	-0.314	-0.134	-0.831	-0.237	-0.211	-0.227	-0.191	-0.229*	-0.187	-0.154*	-0.329
MaxT	-0.118	-0.132	-0.009	-0.007	-0.030	-0.525	-0.092	-0.074	-0.101*	-0.029	-0.089*	-0.049	-0.055	-0.123
MinT	0.424	0.186	0.561*	0.700*	0.185	-0.294	0.090	0.121	0.100	0.151	0.133	0.087	0.115	0.126
Drought	-0.561	-0.910	-0.289	-0.775*	-0.606*	-0.735	-0.434	-0.643*	-0.526	-0.783	-0.559	-0.734*	-0.415	-0.971
Prec	-0.333	-0.084	0.010	-0.086	-0.088	-0.471	-0.272*	-0.096	-0.133	-0.080	-0.149	-0.049	-0.177	0.025
Wind	-0.485	-0.220	-0.253	-0.104	-0.235	-0.567	-0.457	-0.249	-0.173	-0.452*	-0.249	-0.311	-0.411*	-0.052
Fire	-0.322	-0.333	-0.039	-0.136	-0.175	-1.328	-0.282	-0.273	-0.376*	-0.104	-0.347	-0.153	-0.199*	-0.398
Hail	-0.591	-0.425	-0.150	-0.296	-0.373	-0.511	-0.527	-0.371	-0.281	-0.569	-0.344	-0.462	-0.413*	-0.344
	(0.297)	(0.453)	(0.286)	(0.318)	(0.319)	(1.034)	(0.216)	(0.336)	(0.384)	(0.279)	(0.328)	(0.373)	(0.230)	(0.638)

Panel L: real wage wedge (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
	(0.045)	(0.082)	(0.093)	(0.137)	(0.044)	(0.117)	(0.228)	(0.064)	(0.038)	(0.070)	(0.043)	(0.071)	(0.039)	(0.099)
E3CI	-0.018	0.036	0.073	-0.057	0.051	0.032	0.119	0.041	0.054	0.040	0.057	0.034	0.048	0.050
MaxT	-0.020	0.030	-0.011	-0.022	0.030	-0.043	-0.083	0.035	0.013	0.040	0.011	0.046	0.015	0.040
MinT	0.041	-0.015	-0.065	0.214	-0.051	-0.166	-0.372	-0.034	-0.101	-0.006	-0.078	-0.044	-0.080	-0.035
Drought	0.066	-0.017	0.295	-0.254	0.034	0.415	1.270	-0.054	0.190	-0.106	0.208	-0.147	0.130	-0.004
Prec	-0.061	0.120	0.013	0.059	0.063	0.040	-0.324	0.107*	0.024	0.131*	0.010	0.157*	0.018	0.154
Wind	0.013	0.242*	0.117	0.184	0.116	0.165	-0.435	0.188*	0.065	0.227*	0.047	0.253*	0.007	0.300
Fire	-0.045	0.026	0.081	-0.020	0.025	0.017	0.120	0.013	0.019	0.033	0.023	0.025	0.023	0.026
Hail	0.020	0.206	0.256*	0.068	0.123	0.504	0.353	0.139	0.176*	0.135	0.167	0.150	0.093	0.272
	(0.082)	(0.209)	(0.133)	(0.195)	(0.123)	(0.351)	(0.467)	(0.170)	(0.099)	(0.191)	(0.109)	(0.196)	(0.094)	(0.240)

Panel M: labor share (change)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	0.022 (0.116)	0.162 (0.177)	-0.209 (0.250)	-0.230 (0.250)	0.123 (0.124)	0.130 (0.405)	-0.261 (0.283)	0.171 (0.113)	0.125 (0.134)	0.121 (0.126)	0.135 (0.121)	0.104 (0.165)	0.040 (0.105)	0.302 (0.213)
MaxT	0.058 (0.072)	0.139 (0.105)	0.173 (0.157)	0.221* (0.116)	0.121* (0.064)	-0.152 (0.216)	0.063 (0.212)	0.112* (0.058)	0.106 (0.072)	0.108 (0.070)	0.119* (0.066)	0.085 (0.088)	0.048 (0.061)	0.244 (0.120)
MinT	-0.139 (0.224)	-0.075 (0.323)	0.400 (0.384)	0.365 (0.366)	-0.233 (0.251)	0.158 (0.359)	0.256 (0.522)	-0.244 (0.218)	-0.137 (0.237)	-0.294 (0.242)	-0.199 (0.229)	-0.180 (0.288)	-0.181 (0.208)	-0.228 (0.410)
Drought	-0.132 (0.407)	-0.191 (0.353)	-0.398 (0.479)	-0.625* (0.345)	-0.168 (0.350)	0.449 (0.815)	-1.619* (0.842)	0.053 (0.313)	-0.172 (0.405)	-0.051 (0.296)	-0.120 (0.371)	-0.135 (0.392)	-0.099 (0.363)	-0.178 (0.466)
Prec	0.163 (0.172)	0.496 (0.225)	0.314 (0.255)	0.403 (0.158)	0.333 (0.151)	0.121 (0.429)	0.307 (0.466)	0.332 (0.145)	0.314* (0.167)	0.356 (0.161)	0.311* (0.162)	0.361* (0.185)	0.183 (0.141)	0.682 (0.274)
Wind	0.121 (0.211)	0.653 (0.289)	0.156 (0.357)	0.279 (0.318)	0.372* (0.190)	0.206 (0.721)	0.133 (0.611)	0.400 (0.188)	0.334 (0.238)	0.427* (0.233)	0.316 (0.232)	0.455* (0.269)	0.144 (0.223)	0.798 (0.352)
Fire	0.079 (0.177)	0.206 (0.264)	-0.127 (0.233)	-0.229 (0.233)	0.153 (0.203)	0.231 (0.616)	-0.202 (0.461)	0.202 (0.183)	0.145 (0.209)	0.177 (0.209)	0.165 (0.193)	0.145 (0.250)	0.063 (0.162)	0.328 (0.309)
Hail	0.094 (0.288)	0.369 (0.381)	-0.005 (0.393)	-0.163 (0.319)	0.253 (0.307)	0.214 (0.791)	-0.636 (0.598)	0.363 (0.284)	0.223 (0.332)	0.298 (0.328)	0.257 (0.312)	0.242 (0.392)	0.130 (0.275)	0.479 (0.449)

Panel N: unemployment rate (change)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.049 (0.046)	-0.118 (0.043)	-0.081 (0.100)	-0.103 (0.107)	-0.079 (0.039)	-0.082 (0.061)	-0.036 (0.048)	-0.085 (0.037)	-0.066 (0.044)	-0.101 (0.036)	-0.056 (0.039)	-0.125 (0.043)	-0.066* (0.037)	-0.102 (0.049)
MaxT	0.014 (0.023)	-0.050 (0.025)	0.130 (0.061)	0.119 (0.056)	-0.014 (0.019)	-0.048 (0.042)	0.006 (0.025)	-0.021 (0.018)	-0.010 (0.022)	-0.030 (0.020)	-0.004 (0.021)	-0.045 (0.021)	-0.006 (0.018)	-0.040 (0.026)
MinT	0.067 (0.112)	0.143 (0.146)	0.304 (0.220)	0.300 (0.210)	0.121 (0.094)	-0.015 (0.182)	-0.027 (0.094)	0.113 (0.101)	0.074 (0.117)	0.138 (0.090)	0.074 (0.108)	0.152 (0.105)	0.060 (0.079)	0.180 (0.159)
Drought	-0.330 (0.131)	-0.260 (0.128)	-0.360 (0.155)	-0.347 (0.139)	-0.321 (0.111)	-0.076 (0.228)	-0.166 (0.137)	-0.302 (0.109)	-0.273* (0.144)	-0.311 (0.113)	-0.274 (0.132)	-0.314 (0.138)	-0.287 (0.106)	-0.289* (0.158)
Prec	0.029 (0.061)	-0.096 (0.076)	0.173 (0.123)	0.135 (0.110)	-0.032 (0.049)	-0.054 (0.123)	0.048 (0.062)	-0.045 (0.054)	-0.008 (0.054)	-0.079 (0.063)	-0.000 (0.055)	-0.103 (0.069)	-0.013 (0.045)	-0.072 (0.078)
Wind	-0.005 (0.061)	-0.138 (0.125)	-0.007 (0.107)	-0.060 (0.121)	-0.094 (0.067)	0.021 (0.192)	0.096 (0.102)	-0.100 (0.084)	-0.011 (0.072)	-0.192 (0.126)	-0.012 (0.068)	-0.204 (0.145)	-0.066 (0.058)	-0.094 (0.127)
Fire	-0.033 (0.065)	-0.099* (0.052)	-0.005 (0.094)	-0.056 (0.089)	-0.074 (0.054)	-0.066 (0.084)	-0.021 (0.069)	-0.079 (0.052)	-0.049 (0.062)	-0.111 (0.046)	-0.039 (0.059)	-0.135 (0.051)	-0.072 (0.056)	-0.075 (0.060)
Hail	-0.097 (0.101)	-0.201 (0.128)	-0.111 (0.137)	-0.209 (0.142)	-0.188 (0.094)	-0.017 (0.224)	0.006 (0.120)	-0.188* (0.097)	-0.105 (0.114)	-0.265 (0.099)	-0.104 (0.103)	-0.284 (0.124)	-0.164* (0.085)	-0.170 (0.144)

Panel O: labor force (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	0.070 (0.058)	-0.013 (0.067)	-0.054 (0.136)	-0.074 (0.156)	0.009 (0.062)	0.076 (0.107)	0.019 (0.073)	0.018 (0.056)	0.059 (0.051)	-0.049 (0.070)	0.034 (0.042)	-0.014 (0.089)	0.034 (0.061)	-0.009 (0.068)
MaxT	0.023 (0.027)	-0.005 (0.036)	-0.064 (0.065)	-0.105 (0.072)	0.006 (0.023)	-0.006 (0.076)	-0.004 (0.031)	0.006 (0.023)	0.018 (0.021)	-0.015 (0.030)	0.008 (0.019)	-0.000 (0.036)	0.010 (0.025)	-0.005 (0.033)
MinT	-0.173 (0.109)	0.166 (0.133)	-0.054 (0.193)	0.100 (0.202)	-0.078 (0.099)	0.330 (0.129)	-0.129 (0.113)	-0.001 (0.096)	-0.061 (0.097)	0.061 (0.108)	-0.017 (0.086)	-0.007 (0.125)	-0.089 (0.090)	0.150 (0.136)
Drought	0.183 (0.172)	-0.103 (0.183)	-0.039 (0.199)	0.025 (0.195)	0.030 (0.167)	0.045 (0.275)	0.202 (0.197)	0.012 (0.158)	0.152 (0.155)	-0.153 (0.176)	0.074 (0.136)	-0.047 (0.210)	0.098 (0.170)	-0.063 (0.177)
Prec	0.057 (0.071)	-0.084 (0.082)	-0.208 (0.141)	-0.330 (0.148)	0.006 (0.064)	-0.171 (0.143)	-0.038 (0.078)	-0.007 (0.064)	0.010 (0.059)	-0.046 (0.079)	-0.002 (0.053)	-0.028 (0.094)	0.032 (0.064)	-0.087 (0.077)
Wind	-0.011 (0.129)	-0.235 (0.177)	-0.244 (0.155)	-0.383* (0.230)	-0.087 (0.139)	-0.249 (0.198)	-0.153 (0.181)	-0.103 (0.135)	-0.069 (0.119)	-0.175 (0.170)	-0.093 (0.103)	-0.137 (0.202)	-0.036 (0.128)	-0.208 (0.168)
Fire	0.097 (0.078)	0.027 (0.074)	0.031 (0.159)	0.006 (0.187)	0.039 (0.078)	0.178 (0.122)	0.055 (0.086)	0.055 (0.070)	0.103 (0.070)	-0.018 (0.085)	0.073 (0.060)	0.022 (0.103)	0.065 (0.082)	0.041 (0.074)
Hail	0.165 (0.151)	-0.176 (0.195)	-0.124 (0.187)	-0.188 (0.237)	0.010 (0.170)	-0.134 (0.209)	0.011 (0.186)	-0.010 (0.160)	0.088 (0.144)	-0.157 (0.196)	0.027 (0.124)	-0.071 (0.235)	0.087 (0.156)	-0.141 (0.188)

Panel P: entry margin (excess labor force growth over employment growth)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.053 (0.050)	-0.136 (0.051)	-0.089 (0.113)	-0.113 (0.121)	-0.088 (0.043)	-0.097 (0.070)	-0.037 (0.051)	-0.096 (0.041)	-0.073 (0.049)	-0.116 (0.041)	-0.062 (0.043)	-0.143 (0.051)	-0.073* (0.041)	-0.116 (0.057)
MaxT	0.015 (0.025)	-0.057 (0.029)	0.142 (0.068)	0.132 (0.063)	-0.016 (0.021)	-0.055 (0.048)	0.006 (0.027)	-0.024 (0.021)	-0.012 (0.025)	-0.034 (0.024)	-0.006 (0.023)	-0.051* (0.026)	-0.007 (0.020)	-0.046 (0.030)
MinT	0.075 (0.125)	0.161 (0.170)	0.353 (0.247)	0.343 (0.234)	0.137 (0.106)	-0.027 (0.211)	-0.032 (0.103)	0.126 (0.116)	0.083 (0.133)	0.155 (0.105)	0.083 (0.122)	0.170 (0.123)	0.067 (0.088)	0.202 (0.185)

Drought	-0.360 (0.144)	-0.296 (0.149)	-0.397 (0.178)	-0.392 (0.158)	-0.358 (0.123)	-0.086 (0.264)	-0.172 (0.148)	-0.338 (0.123)	-0.302* (0.163)	-0.351 (0.133)	-0.300 (0.149)	-0.361 (0.162)	-0.315 (0.117)	-0.329* (0.184)
Prec	0.031 (0.066)	-0.112 (0.089)	0.187 (0.140)	0.151 (0.128)	-0.038 (0.055)	-0.069 (0.145)	0.054 (0.067)	-0.053 (0.062)	-0.009 (0.061)	-0.093 (0.074)	-0.003 (0.061)	-0.119 (0.083)	-0.018 (0.049)	-0.083 (0.092)
Wind	-0.007 (0.066)	-0.168 (0.147)	-0.014 (0.122)	-0.074 (0.141)	-0.111 (0.075)	0.007 (0.230)	0.109 (0.114)	-0.120 (0.096)	-0.013 (0.080)	-0.234 (0.148)	-0.016 (0.076)	-0.247 (0.171)	-0.082 (0.065)	-0.113 (0.150)
Fire	-0.037 (0.070)	-0.113* (0.061)	-0.005 (0.106)	-0.061 (0.101)	-0.082 (0.061)	-0.079 (0.097)	-0.020 (0.074)	-0.090 (0.058)	-0.053 (0.070)	-0.126 (0.054)	-0.044 (0.064)	-0.152 (0.061)	-0.080 (0.060)	-0.085 (0.070)
Hail	-0.105 (0.110)	-0.233 (0.150)	-0.124 (0.155)	-0.239 (0.162)	-0.212 (0.103)	-0.031 (0.264)	0.015 (0.131)	-0.214 (0.109)	-0.113 (0.127)	-0.310 (0.117)	-0.114 (0.115)	-0.331 (0.147)	-0.185 (0.092)	-0.195 (0.168)

The table reports estimates from asymmetric dynamic panel regressions. All specifications include Autometrics-selected country fixed effects and macro-financial controls for economic uncertainty, geopolitical risk, financial stress and business cycle conditions. The conditioning variable is climate uncertainty (IQR), computed from the E3CI composite index and from each of its components. It is interacted with pairs of dummies partitioning countries according to whether they stand above or below the annual cross-country mean of the Notre Dame Global Adaptation Index (Adaptation), of the CCPI-mm mitigation index (Mitigation), of real per capita GDP (Income) and of average temperature (Temperature), and, in addition, according to EU membership (Institutions) and geographical position (Latitude: North/South; Longitude: West/East). Coefficients are scaled by the pooled standard deviation of the annual within-country change of the underlying series, so that they measure the impact of a typical annual change. The climate measures are per-country GETS. Bold figures denote significance at the 10% level or better; an asterisk marks significance at 10% but not 5%.

Table A7-B: Dynamic panel regressions with GETS-Autometrics country fixed effects and macro-fin control variables: Asymmetric models, climate risk (Median) (per-country GETS measures)

Panel A: real GDP growth rate														
	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.180* (0.099)	-0.223* (0.132)	-0.506 (0.310)	-0.534 (0.327)	-0.213* (0.124)	-0.231 (0.172)	-0.106 (0.130)	-0.227* (0.127)	-0.208 (0.104)	-0.227 (0.152)	-0.238 (0.097)	-0.179 (0.174)	-0.169 (0.127)	-0.286 (0.129)
MaxT	-0.104 (0.067)	-0.129 (0.081)	-0.368* (0.204)	-0.408 (0.206)	-0.122 (0.075)	-0.139 (0.121)	-0.058 (0.092)	-0.131* (0.076)	-0.122* (0.068)	-0.128 (0.086)	-0.140 (0.064)	-0.098 (0.099)	-0.092 (0.078)	-0.178 (0.080)
MinT †	-0.435 (0.306)	-0.428 (0.386)	-1.083 (0.685)	-1.269* (0.677)	-0.433* (0.258)	-0.136 (0.401)	-0.377 (0.269)	-0.395 (0.276)	-0.337 (0.267)	-0.484* (0.285)	-0.405 (0.263)	-0.373 (0.310)	-0.359 (0.249)	-0.473 (0.381)
Drought	-0.461 (0.365)	-0.678* (0.392)	-0.665 (0.551)	-0.541 (0.573)	-0.453 (0.381)	-0.889* (0.476)	0.047 (0.427)	-0.590 (0.363)	-0.470 (0.346)	-0.614 (0.397)	-0.526 (0.352)	-0.528 (0.441)	-0.422 (0.356)	-0.657 (0.412)
Prec	-0.160 (0.386)	-0.160 (0.367)	0.085 (0.490)	-0.109 (0.428)	-0.303 (0.322)	-0.191 (0.564)	-0.360 (0.457)	-0.281 (0.310)	-0.297 (0.331)	-0.276 (0.334)	-0.315 (0.336)	-0.245 (0.358)	-0.243 (0.323)	-0.367 (0.371)
Wind	-0.350 (0.166)	-0.496 (0.246)	-0.581 (0.363)	-0.571 (0.386)	-0.407* (0.219)	-0.555 (0.257)	-0.223 (0.186)	-0.453 (0.231)	-0.381 (0.169)	-0.512* (0.283)	-0.404 (0.156)	-0.473 (0.318)	-0.359* (0.207)	-0.534 (0.242)
Fire	-0.149 (0.113)	-0.139 (0.136)	-0.058 (0.351)	-0.011 (0.376)	-0.151 (0.139)	-0.205 (0.163)	-0.101 (0.136)	-0.164 (0.137)	-0.178 (0.116)	-0.126 (0.160)	-0.222 (0.103)	-0.059 (0.187)	-0.114 (0.147)	-0.215* (0.122)
Hail	0.316* (0.178)	0.523 (0.233)	0.805* (0.472)	1.014 (0.490)	0.368* (0.202)	0.614* (0.370)	-0.120 (0.302)	0.471 (0.201)	0.368* (0.197)	0.491 (0.220)	0.385 (0.176)	0.462* (0.265)	0.304 (0.203)	0.559 (0.255)
Panel B: real consumption growth rate														
	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.257* (0.140)	-0.245* (0.126)	-0.609 (0.378)	-0.606* (0.341)	-0.212 (0.135)	-0.348* (0.202)	-0.191 (0.177)	-0.236 (0.119)	-0.230* (0.122)	-0.233 (0.143)	-0.268 (0.112)	-0.173 (0.161)	-0.205 (0.158)	-0.272 (0.121)
MaxT	-0.148* (0.085)	-0.177 (0.077)	-0.495 (0.227)	-0.518 (0.203)	-0.130* (0.078)	-0.235* (0.137)	-0.074 (0.104)	-0.151 (0.071)	-0.137* (0.078)	-0.153* (0.080)	-0.154 (0.074)	-0.125 (0.092)	-0.113 (0.090)	-0.195 (0.079)
MinT †	-0.613 (0.306)	-0.459 (0.377)	-1.289* (0.689)	-1.373* (0.714)	-0.433* (0.255)	-0.167 (0.465)	-0.383 (0.303)	-0.400 (0.255)	-0.394 (0.256)	-0.404 (0.294)	-0.433* (0.247)	-0.338 (0.330)	-0.394 (0.263)	-0.409 (0.369)
Drought	-0.478 (0.462)	-0.458 (0.389)	-0.401 (0.651)	-0.314 (0.561)	-0.358 (0.447)	-0.966 (0.593)	-0.574 (0.506)	-0.446 (0.382)	-0.494 (0.413)	-0.404 (0.423)	-0.554 (0.410)	-0.312 (0.461)	-0.430 (0.467)	-0.494 (0.413)
Prec	-0.378 (0.413)	-0.324 (0.377)	-0.263 (0.505)	-0.303 (0.497)	-0.328 (0.361)	-0.373 (0.653)	-0.253 (0.414)	-0.343 (0.333)	-0.307 (0.388)	-0.376 (0.338)	-0.364 (0.383)	-0.284 (0.348)	-0.308 (0.350)	-0.377 (0.426)
Wind	-0.510 (0.258)	-0.407* (0.242)	-0.584 (0.463)	-0.547 (0.397)	-0.370 (0.247)	-0.679* (0.360)	-0.621 (0.294)	-0.398* (0.217)	-0.415 (0.210)	-0.427 (0.276)	-0.473 (0.194)	-0.335 (0.301)	-0.422 (0.285)	-0.416* (0.214)
Fire	-0.171 (0.156)	-0.102 (0.123)	-0.083 (0.413)	0.010 (0.375)	-0.113 (0.151)	-0.298 (0.215)	-0.060 (0.203)	-0.142 (0.136)	-0.156 (0.148)	-0.101 (0.140)	-0.203 (0.134)	-0.028 (0.164)	-0.109 (0.183)	-0.168 (0.131)
Hail	0.438 (0.192)	0.733 (0.268)	0.724 (0.558)	1.011* (0.554)	0.479 (0.217)	0.966 (0.471)	0.312 (0.225)	0.600 (0.196)	0.567 (0.187)	0.580 (0.258)	0.566 (0.169)	0.582* (0.304)	0.448 (0.219)	0.735 (0.264)
Panel C: real investment growth rate														
	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.243 (0.229)	-0.241 (0.259)	-0.364 (0.644)	-0.227 (0.626)	0.007 (0.187)	-1.078 (0.545)	-0.432 (0.564)	-0.116 (0.169)	-0.259 (0.195)	0.032 (0.177)	-0.280 (0.196)	0.066 (0.207)	0.018 (0.233)	-0.395 (0.311)
MaxT	-0.185 (0.146)	-0.229 (0.174)	-0.473 (0.438)	-0.462 (0.416)	-0.018 (0.120)	-0.895 (0.345)	-0.191 (0.353)	-0.121 (0.112)	-0.197 (0.126)	-0.021 (0.119)	-0.194 (0.127)	-0.020 (0.137)	-0.002 (0.148)	-0.335 (0.207)
MinT †	-0.818 (0.605)	-0.564 (0.819)	-0.249 (1.482)	0.133 (1.533)	-0.105 (0.461)	-1.471 (1.310)	-1.593* (0.965)	-0.154 (0.484)	-0.423 (0.512)	-0.076 (0.457)	-0.597 (0.488)	0.243 (0.532)	-0.203 (0.455)	-0.485 (0.967)
Drought	-0.128 (0.608)	0.171 (0.600)	-0.088 (0.753)	0.592 (0.864)	0.167 (0.556)	-0.602 (1.222)	-2.378 (0.934)	0.299 (0.444)	-0.121 (0.561)	0.280 (0.613)	-0.317 (0.588)	0.584 (0.797)	-0.217 (0.720)	0.348 (0.781)
Prec	-0.384 (0.613)	-0.762 (0.946)	-0.538 (0.897)	-0.703 (1.098)	-0.059 (0.460)	-2.011 (2.064)	1.006 (1.809)	-0.448 (0.497)	-0.429 (0.647)	-0.122 (0.510)	-0.326 (0.686)	-0.276 (0.633)	0.357 (0.555)	-1.414 (1.211)
Wind	-0.128 (0.345)	-0.113 (0.359)	-0.216 (0.653)	0.198 (0.623)	0.112 (0.263)	-0.768 (0.796)	-0.613 (1.056)	0.036 (0.229)	-0.106 (0.258)	0.101 (0.290)	-0.199 (0.266)	0.244 (0.364)	0.137 (0.379)	-0.264 (0.456)
Fire	-0.314 (0.233)	-0.121 (0.219)	-0.139 (0.436)	0.098 (0.397)	-0.026 (0.214)	-1.062 (0.482)	-0.745* (0.452)	-0.077 (0.183)	-0.326 (0.213)	0.127 (0.196)	-0.337* (0.204)	0.151 (0.217)	-0.068 (0.253)	-0.243 (0.245)
Hail	0.195 (0.421)	0.799 (0.526)	0.306 (0.842)	0.629 (0.745)	0.090 (0.441)	2.275 (0.969)	0.550 (0.975)	0.501 (0.393)	0.591 (0.465)	0.367 (0.457)	0.615 (0.475)	0.331 (0.557)	0.199 (0.548)	0.908 (0.704)
Panel D: employed persons (growth rate)														
	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	0.042 (0.074)	0.083 (0.072)	-0.112 (0.150)	-0.149 (0.168)	0.042 (0.065)	0.121 (0.091)	0.017 (0.066)	0.057 (0.062)	0.048 (0.068)	0.062 (0.064)	0.031 (0.053)	0.089 (0.090)	0.052 (0.064)	0.055 (0.074)

MaxT	0.018 (0.046)	0.050 (0.044)	-0.108 (0.100)	-0.142 (0.114)	0.023 (0.037)	0.063 (0.068)	0.013 (0.041)	0.030 (0.035)	0.025 (0.040)	0.034 (0.036)	0.017 (0.033)	0.048 (0.049)	0.024 (0.038)	0.037 (0.044)
MinT †	0.147 (0.170)	-0.020 (0.194)	-0.025 (0.366)	-0.275 (0.395)	-0.102 (0.126)	-0.197 (0.241)	-0.001 (0.121)	-0.197 (0.127)	0.063 (0.133)	0.058 (0.133)	0.033 (0.118)	0.109 (0.163)	0.090 (0.112)	-0.005 (0.188)
Drought	0.183 (0.172)	0.220 (0.209)	0.137 (0.201)	0.228 (0.218)	0.159 (0.176)	0.426* (0.255)	0.128 (0.163)	0.211 (0.164)	0.220 (0.171)	0.175 (0.194)	0.155 (0.133)	0.277 (0.271)	0.203 (0.167)	0.201 (0.241)
Prec	-0.063 (0.152)	0.047 (0.210)	-0.316* (0.192)	-0.458 (0.214)	-0.018 (0.127)	0.012 (0.364)	-0.099 (0.160)	-0.005 (0.128)	-0.042 (0.139)	0.029 (0.155)	-0.035 (0.134)	0.021 (0.184)	0.001 (0.122)	-0.038 (0.206)
Wind	0.080 (0.110)	0.104 (0.148)	-0.043 (0.169)	-0.062 (0.197)	0.070 (0.118)	0.122 (0.146)	-0.041 (0.097)	0.091 (0.114)	0.066 (0.108)	0.097 (0.134)	0.042 (0.080)	0.135 (0.187)	0.106 (0.103)	0.036 (0.148)
Fire	0.053 (0.090)	0.086 (0.062)	-0.031 (0.128)	-0.025 (0.143)	0.046 (0.072)	0.232 (0.083)	0.057 (0.083)	0.068 (0.066)	0.066 (0.084)	0.068 (0.055)	0.047 (0.066)	0.098 (0.083)	0.068 (0.081)	0.065 (0.064)
Hail	-0.041 (0.101)	-0.158 (0.144)	-0.110 (0.205)	0.070 (0.258)	-0.078 (0.107)	-0.180 (0.228)	-0.055 (0.095)	-0.102 (0.099)	-0.099 (0.089)	-0.095 (0.136)	-0.061 (0.077)	-0.157 (0.173)	-0.046 (0.105)	-0.166 (0.154)

Panel E: hours worked per employed person (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	0.013 (0.071)	0.004 (0.090)	-0.272 (0.239)	-0.282 (0.234)	-0.034 (0.098)	0.088 (0.073)	-0.007 (0.090)	-0.021 (0.095)	-0.024 (0.073)	-0.013 (0.129)	-0.018 (0.082)	-0.022 (0.120)	-0.023 (0.106)	-0.015 (0.073)
MaxT	0.018 (0.039)	0.010 (0.051)	-0.137 (0.158)	-0.137 (0.156)	-0.011 (0.053)	0.061 (0.054)	-0.002 (0.050)	-0.004 (0.051)	-0.009 (0.041)	0.004 (0.068)	-0.005 (0.044)	-0.001 (0.066)	-0.005 (0.057)	-0.001 (0.041)
MinT †	-0.055 (0.152)	-0.124 (0.187)	-0.491 (0.384)	-0.464 (0.367)	-0.119 (0.170)	-0.092 (0.163)	-0.081 (0.172)	-0.120 (0.165)	-0.106 (0.150)	-0.132 (0.198)	-0.103 (0.154)	-0.148 (0.200)	-0.126 (0.173)	-0.090 (0.150)
Drought	-0.119 (0.173)	-0.276 (0.278)	-0.368 (0.280)	-0.322 (0.294)	-0.211 (0.225)	-0.172 (0.298)	-0.018 (0.203)	-0.228 (0.218)	-0.154 (0.143)	-0.281 (0.333)	-0.117 (0.172)	-0.368 (0.320)	-0.132 (0.245)	-0.300 (0.193)
Prec	0.100 (0.133)	0.239 (0.185)	0.102 (0.210)	-0.004 (0.164)	0.019 (0.161)	0.418 (0.268)	-0.020 (0.180)	0.074 (0.164)	0.018 (0.144)	0.132 (0.206)	0.009 (0.144)	0.174 (0.223)	-0.010 (0.180)	0.193 (0.156)
Wind	-0.107 (0.144)	-0.094 (0.186)	-0.342 (0.240)	-0.382 (0.235)	-0.161 (0.189)	0.064 (0.134)	-0.058 (0.172)	-0.140 (0.180)	-0.117 (0.135)	-0.153 (0.256)	-0.109 (0.156)	-0.173 (0.232)	-0.133 (0.199)	-0.127 (0.149)
Fire	0.055 (0.068)	0.041 (0.090)	-0.064 (0.209)	-0.066 (0.209)	0.021 (0.095)	0.086 (0.103)	0.015 (0.086)	0.029 (0.094)	0.020 (0.071)	0.037 (0.125)	0.025 (0.080)	0.032 (0.118)	0.030 (0.108)	0.023 (0.073)
Hail	0.033 (0.087)	0.178 (0.140)	0.369 (0.245)	0.297 (0.219)	0.130 (0.107)	0.028 (0.158)	0.001 (0.118)	0.126 (0.099)	0.101 (0.074)	0.133 (0.159)	0.069 (0.083)	0.200 (0.168)	0.060 (0.108)	0.191* (0.102)

Panel F: labor productivity – output per worker (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.264 (0.073)	-0.425 (0.084)	-0.438 (0.200)	-0.353* (0.203)	-0.343 (0.079)	-0.427 (0.127)	-0.167 (0.132)	-0.376 (0.081)	-0.338 (0.072)	-0.381 (0.105)	-0.345 (0.074)	-0.372 (0.108)	-0.273 (0.085)	-0.488 (0.087)
MaxT	-0.157 (0.052)	-0.267 (0.057)	-0.312 (0.132)	-0.264 (0.118)	-0.205 (0.052)	-0.266 (0.084)	-0.104 (0.088)	-0.226 (0.052)	-0.207 (0.051)	-0.223 (0.063)	-0.212 (0.050)	-0.215 (0.068)	-0.153 (0.055)	-0.323 (0.058)
MinT †	-0.633 (0.233)	-0.543* (0.293)	-0.895 (0.451)	-0.752* (0.403)	-0.656 (0.194)	-0.012 (0.279)	-0.425* (0.248)	-0.585 (0.209)	-0.526 (0.208)	-0.639 (0.221)	-0.545 (0.210)	-0.613 (0.220)	-0.535 (0.187)	-0.654 (0.306)
Drought	-0.617 (0.305)	-0.913 (0.309)	-0.554 (0.387)	-0.472 (0.334)	-0.637* (0.328)	-1.206 (0.473)	-0.053 (0.423)	-0.807 (0.317)	-0.687 (0.310)	-0.801 (0.336)	-0.635 (0.316)	-0.881 (0.328)	-0.586* (0.302)	-0.910 (0.392)
Prec	-0.207 (0.356)	-0.462 (0.294)	0.097 (0.448)	0.152 (0.293)	-0.484* (0.262)	-0.348 (0.374)	-0.376 (0.418)	-0.476* (0.247)	-0.444 (0.270)	-0.499* (0.258)	-0.477* (0.271)	-0.448 (0.274)	-0.377 (0.259)	-0.627 (0.289)
Wind	-0.445 (0.113)	-0.722 (0.143)	-0.508 (0.237)	-0.408* (0.227)	-0.577 (0.127)	-0.709 (0.223)	-0.193 (0.196)	-0.643 (0.143)	-0.522 (0.110)	-0.723 (0.174)	-0.508 (0.115)	-0.744 (0.166)	-0.509 (0.132)	-0.730 (0.170)
Fire	-0.249 (0.086)	-0.292 (0.090)	-0.055 (0.252)	0.027 (0.246)	-0.260 (0.094)	-0.507 (0.145)	-0.201 (0.126)	-0.298 (0.096)	-0.313 (0.086)	-0.253 (0.118)	-0.332 (0.081)	-0.222* (0.126)	-0.229 (0.100)	-0.370 (0.089)
Hail	0.416 (0.140)	0.868 (0.216)	0.729 (0.353)	0.729 (0.294)	0.580 (0.185)	0.766 (0.286)	-0.007 (0.308)	0.682 (0.181)	0.560 (0.180)	0.706 (0.197)	0.509 (0.161)	0.790 (0.225)	0.366 (0.173)	0.951 (0.256)

Panel G: labor productivity – output per hour worked (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.229 (0.080)	-0.374 (0.080)	-0.143 (0.215)	-0.079 (0.203)	-0.277 (0.072)	-0.489 (0.123)	-0.123 (0.169)	-0.327 (0.058)	-0.305 (0.080)	-0.301 (0.070)	-0.302 (0.078)	-0.305 (0.083)	-0.228 (0.078)	-0.444 (0.079)
MaxT	-0.156 (0.050)	-0.243 (0.045)	-0.197 (0.133)	-0.168 (0.120)	-0.185 (0.040)	-0.285 (0.080)	-0.087 (0.095)	-0.210 (0.033)	-0.200 (0.047)	-0.190 (0.038)	-0.198 (0.045)	-0.192 (0.047)	-0.142 (0.042)	-0.309 (0.046)
MinT †	-0.393* (0.209)	-0.278 (0.246)	-0.203 (0.395)	-0.106 (0.342)	-0.416 (0.148)	0.007 (0.346)	-0.230 (0.254)	-0.392 (0.151)	-0.376 (0.165)	-0.370 (0.168)	-0.395 (0.161)	-0.320* (0.191)	-0.331 (0.143)	-0.497* (0.254)
Drought	-0.294 (0.257)	-0.401 (0.284)	0.052 (0.315)	0.125 (0.240)	-0.216 (0.254)	-0.888 (0.579)	0.105 (0.498)	-0.368 (0.244)	-0.331 (0.273)	-0.298 (0.276)	-0.337 (0.263)	-0.281 (0.316)	-0.280 (0.269)	-0.366 (0.350)
Prec	-0.293 (0.295)	-0.719 (0.284)	-0.218 (0.363)	-0.107 (0.279)	-0.532 (0.188)	-0.802 (0.501)	-0.365 (0.354)	-0.587 (0.181)	-0.540 (0.211)	-0.596 (0.206)	-0.515 (0.203)	-0.658 (0.237)	-0.403 (0.192)	-0.871 (0.263)

Wind	-0.199	-0.522	-0.030	0.087	-0.304	-0.811	-0.036	-0.417	-0.321	-0.462	-0.314	-0.496	-0.298	-0.500
	(0.130)	(0.180)	(0.218)	(0.174)	(0.127)	(0.243)	(0.327)	(0.109)	(0.132)	(0.141)	(0.125)	(0.158)	(0.146)	(0.171)
Fire	-0.258	-0.261	-0.082	-0.012	-0.250	-0.483	-0.188	-0.283	-0.322	-0.203	-0.319	-0.187	-0.227	-0.341
	(0.069)	(0.060)	(0.124)	(0.116)	(0.060)	(0.148)	(0.146)	(0.050)	(0.072)	(0.057)	(0.070)	(0.073)	(0.070)	(0.059)
Hail	0.287	0.573	0.112	0.171	0.349	0.656*	-0.073	0.457	0.364	0.457	0.370	0.460	0.245	0.632
	(0.130)	(0.178)	(0.290)	(0.205)	(0.132)	(0.337)	(0.326)	(0.133)	(0.156)	(0.145)	(0.135)	(0.184)	(0.155)	(0.226)

Panel H: real product wage (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.217	-0.320	-0.093	-0.114	-0.176	-0.766	-0.069	-0.267	-0.276	-0.191	-0.257	-0.226	-0.188	-0.356
	(0.069)	(0.124)	(0.179)	(0.162)	(0.071)	(0.236)	(0.196)	(0.077)	(0.088)	(0.090)	(0.071)	(0.102)	(0.051)	(0.154)
MaxT	-0.124	-0.224	-0.097	-0.106	-0.109	-0.537	-0.033	-0.168	-0.183	-0.101*	-0.162	-0.138	-0.103	-0.264
	(0.043)	(0.086)	(0.104)	(0.094)	(0.045)	(0.152)	(0.121)	(0.051)	(0.054)	(0.061)	(0.044)	(0.069)	(0.032)	(0.102)
MinT †	-0.419	-0.533*	-0.523	-0.461	-0.343	-0.495	-0.227	-0.372	-0.358	-0.354*	-0.330	-0.413	-0.286	-0.585
	(0.181)	(0.299)	(0.266)	(0.298)	(0.147)	(0.458)	(0.320)	(0.158)	(0.157)	(0.182)	(0.139)	(0.209)	(0.112)	(0.409)
Drought	-0.397*	-0.828	-0.272	-0.271	-0.401	-1.846*	-0.892*	-0.569	-0.566	-0.664	-0.583*	-0.636	-0.395	-0.889*
	(0.223)	(0.350)	(0.299)	(0.281)	(0.187)	(0.968)	(0.505)	(0.242)	(0.363)	(0.205)	(0.315)	(0.223)	(0.195)	(0.478)
Prec	-0.269	-0.025	0.210	0.237	-0.080	-0.512	0.371	-0.179	-0.156	-0.069	-0.157	-0.064	-0.233	0.094
	(0.128)	(0.381)	(0.277)	(0.264)	(0.133)	(0.917)	(0.517)	(0.202)	(0.176)	(0.260)	(0.142)	(0.282)	(0.111)	(0.448)
Wind	-0.385	-0.468	-0.190	-0.156	-0.305	-0.895	-0.190	-0.406	-0.296*	-0.539	-0.334	-0.472	-0.363	-0.418*
	(0.146)	(0.176)	(0.246)	(0.225)	(0.101)	(0.401)	(0.293)	(0.121)	(0.154)	(0.094)	(0.138)	(0.130)	(0.103)	(0.224)
Fire	-0.170*	-0.203	0.069	0.063	-0.094	-1.183	-0.201	-0.174*	-0.255	-0.047	-0.226	-0.095	-0.131	-0.252
	(0.087)	(0.151)	(0.146)	(0.100)	(0.095)	(0.346)	(0.242)	(0.101)	(0.114)	(0.099)	(0.093)	(0.119)	(0.066)	(0.185)
Hail	0.302	0.910	0.472	0.419	0.360	1.489	0.155	0.594	0.546	0.555	0.508	0.623	0.285	0.942
	(0.118)	(0.228)	(0.237)	(0.270)	(0.115)	(0.442)	(0.277)	(0.135)	(0.180)	(0.176)	(0.149)	(0.200)	(0.103)	(0.271)

Panel I: real consumption wage (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.218	-0.190	-0.076	-0.082	-0.074	-0.739	-0.202	-0.138	-0.169	-0.100	-0.172*	-0.096	-0.132	-0.167
	(0.082)	(0.158)	(0.194)	(0.185)	(0.092)	(0.299)	(0.059)	(0.105)	(0.107)	(0.113)	(0.088)	(0.137)	(0.064)	(0.208)
MaxT	-0.124	-0.135	-0.078	-0.087	-0.042	-0.523	-0.102	-0.085	-0.109*	-0.046	-0.103	-0.057	-0.065*	-0.131
	(0.050)	(0.103)	(0.119)	(0.114)	(0.056)	(0.185)	(0.036)	(0.064)	(0.062)	(0.073)	(0.051)	(0.089)	(0.039)	(0.133)
MinT †	-0.422*	-0.085	-0.454	-0.428	-0.072	0.164	-0.139	-0.043	-0.011	-0.132	-0.058	-0.042	-0.114	0.129
	(0.232)	(0.376)	(0.324)	(0.368)	(0.182)	(0.578)	(0.158)	(0.183)	(0.164)	(0.227)	(0.149)	(0.271)	(0.147)	(0.481)
Drought	-0.318	-0.769*	-0.186	-0.392	-0.375	-1.494	-0.314	-0.558*	-0.453	-0.665	-0.453	-0.668	-0.350	-0.784
	(0.238)	(0.407)	(0.266)	(0.328)	(0.232)	(0.996)	(0.217)	(0.299)	(0.380)	(0.240)	(0.334)	(0.307)	(0.218)	(0.552)
Prec	-0.340	0.247	0.146	0.424*	0.108	-0.573	-0.363	0.087	-0.057	0.213	-0.094	0.294	-0.139	0.407
	(0.141)	(0.363)	(0.299)	(0.250)	(0.156)	(0.832)	(0.261)	(0.190)	(0.192)	(0.255)	(0.172)	(0.306)	(0.143)	(0.438)
Wind	-0.370	-0.284	-0.167	-0.119	-0.152	-0.817*	-0.415	-0.218	-0.169	-0.358	-0.231	-0.250	-0.284	-0.163
	(0.171)	(0.240)	(0.266)	(0.269)	(0.137)	(0.496)	(0.154)	(0.160)	(0.185)	(0.152)	(0.159)	(0.192)	(0.128)	(0.300)
Fire	-0.185	-0.151	0.108	0.069	-0.070	-0.999	-0.169	-0.136	-0.222*	-0.004	-0.197*	-0.047	-0.107	-0.195
	(0.093)	(0.185)	(0.157)	(0.141)	(0.123)	(0.357)	(0.045)	(0.139)	(0.134)	(0.131)	(0.111)	(0.163)	(0.075)	(0.240)
Hail	0.243	0.705	0.417*	0.486	0.250*	1.327	0.142	0.457	0.412	0.450	0.382	0.505*	0.244	0.695
	(0.120)	(0.258)	(0.240)	(0.330)	(0.149)	(0.497)	(0.151)	(0.168)	(0.192)	(0.208)	(0.156)	(0.261)	(0.123)	(0.329)

Panel L: real wage wedge (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.027	0.055	0.060	0.041	0.044	-0.022	-0.100	0.053	0.019	0.069	0.018	0.071	0.018	0.071
	(0.051)	(0.063)	(0.092)	(0.097)	(0.033)	(0.116)	(0.200)	(0.046)	(0.037)	(0.055)	(0.043)	(0.059)	(0.040)	(0.072)
MaxT	-0.018	0.025	0.011	-0.008	0.026	-0.037	-0.047	0.027	0.012	0.034	0.010	0.037	0.014	0.032
	(0.036)	(0.038)	(0.083)	(0.071)	(0.020)	(0.078)	(0.130)	(0.025)	(0.025)	(0.031)	(0.028)	(0.035)	(0.027)	(0.045)
MinT †	-0.026	0.131	0.091	-0.051	0.089	0.232	0.049	0.107	0.107	0.090	0.086	0.133	0.072	0.186
	(0.104)	(0.153)	(0.187)	(0.157)	(0.063)	(0.244)	(0.337)	(0.082)	(0.067)	(0.100)	(0.072)	(0.116)	(0.069)	(0.166)
Drought	0.102	0.104	0.232	-0.008	0.075	0.229	0.565	0.041	0.129	0.041	0.149	0.006	0.042	0.170
	(0.146)	(0.138)	(0.157)	(0.164)	(0.107)	(0.218)	(0.527)	(0.126)	(0.114)	(0.164)	(0.132)	(0.167)	(0.121)	(0.157)
Prec	-0.154	0.089	-0.167	0.043	0.089	-0.303	-0.874*	0.154*	-0.037	0.205*	-0.051	0.237*	0.028	0.096
	(0.185)	(0.157)	(0.168)	(0.100)	(0.091)	(0.355)	(0.521)	(0.080)	(0.132)	(0.120)	(0.148)	(0.141)	(0.144)	(0.180)
Wind	0.002	0.125	0.088	0.097	0.104	0.006	-0.215	0.126	0.056	0.154	0.058	0.149	0.040	0.173*
	(0.063)	(0.091)	(0.096)	(0.111)	(0.064)	(0.167)	(0.204)	(0.080)	(0.055)	(0.096)	(0.063)	(0.094)	(0.056)	(0.097)
Fire	-0.036	0.028	0.052	0.020	0.017	0.002	0.001	0.017	0.003	0.036	0.004	0.035	0.006	0.031
	(0.057)	(0.069)	(0.069)	(0.081)	(0.035)	(0.122)	(0.247)	(0.052)	(0.041)	(0.062)	(0.049)	(0.066)	(0.046)	(0.082)
Hail	-0.036	-0.055	-0.124	0.060	-0.051	-0.001	-0.072	-0.039	-0.046	-0.037	-0.053	-0.024	-0.005	-0.098
	(0.076)	(0.075)	(0.117)	(0.103)	(0.069)	(0.179)	(0.257)	(0.070)	(0.068)	(0.093)	(0.064)	(0.098)	(0.073)	(0.084)

Panel M: labor share (change)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	0.053	0.230*	0.088	0.103	0.158	0.069	-0.007	0.173	0.156	0.148	0.159	0.145	0.053	0.356
	(0.098)	(0.138)	(0.157)	(0.137)	(0.098)	(0.289)	(0.278)	(0.087)	(0.105)	(0.104)	(0.101)	(0.127)	(0.085)	(0.164)
MaxT	0.044	0.127	0.079	0.102	0.101*	-0.059	0.008	0.104*	0.092	0.095	0.101	0.080	0.038	0.214
	(0.063)	(0.094)	(0.104)	(0.087)	(0.061)	(0.225)	(0.185)	(0.055)	(0.067)	(0.065)	(0.062)	(0.081)	(0.054)	(0.109)
MinT †	0.180	0.352	-0.037	0.114	0.328*	-0.232	0.001	0.343*	0.266	0.377*	0.305	0.305	0.218	0.583
	(0.189)	(0.309)	(0.308)	(0.282)	(0.194)	(0.470)	(0.466)	(0.185)	(0.200)	(0.206)	(0.188)	(0.244)	(0.170)	(0.388)
Drought	-0.041	0.016	-0.031	-0.213	-0.062	-0.068	-1.047	0.063	-0.066	-0.057	0.001	-0.164	-0.140	0.067
	(0.296)	(0.297)	(0.400)	(0.284)	(0.266)	(1.230)	(0.779)	(0.225)	(0.361)	(0.221)	(0.315)	(0.352)	(0.287)	(0.359)
Prec	0.135	0.779	0.176	0.393	0.473*	0.745	0.848	0.444	0.521*	0.430	0.427	0.594*	0.209	1.105
	(0.331)	(0.369)	(0.424)	(0.273)	(0.246)	(0.824)	(0.827)	(0.226)	(0.280)	(0.261)	(0.281)	(0.317)	(0.244)	(0.441)
Wind	-0.013	0.402	0.031	0.048	0.198*	0.482	-0.129	0.258	0.248*	0.161	0.203	0.234	0.030	0.554
	(0.146)	(0.166)	(0.264)	(0.234)	(0.118)	(0.506)	(0.339)	(0.116)	(0.143)	(0.136)	(0.151)	(0.176)	(0.135)	(0.207)
Fire	0.070	0.151	0.021	-0.048	0.122	0.074	-0.027	0.138	0.115	0.126	0.130	0.103	0.055	0.232
	(0.118)	(0.171)	(0.153)	(0.160)	(0.130)	(0.405)	(0.337)	(0.115)	(0.133)	(0.135)	(0.124)	(0.160)	(0.104)	(0.194)
Hail	-0.058	-0.117	0.095	-0.129	-0.132	0.360	0.368	-0.146	-0.071	-0.118	-0.150	0.015	0.031	-0.309
	(0.140)	(0.231)	(0.379)	(0.314)	(0.101)	(0.707)	(0.417)	(0.121)	(0.196)	(0.126)	(0.136)	(0.237)	(0.145)	(0.315)

Panel N: unemployment rate (change)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.004	-0.083	0.049	0.022	-0.041	-0.059	-0.000	-0.049*	-0.025	-0.075	-0.017	-0.096	-0.032	-0.061
	(0.034)	(0.038)	(0.067)	(0.069)	(0.029)	(0.060)	(0.037)	(0.029)	(0.032)	(0.033)	(0.030)	(0.039)	(0.028)	(0.040)
MaxT	0.003	-0.049	0.062	0.049	-0.021	-0.037	0.003	-0.026	-0.013	-0.038*	-0.008	-0.052	-0.014	-0.038
	(0.022)	(0.023)	(0.046)	(0.045)	(0.018)	(0.037)	(0.023)	(0.018)	(0.021)	(0.020)	(0.020)	(0.022)	(0.018)	(0.024)
MinT †	-0.024	-0.154	-0.111	-0.122	-0.083	-0.017	0.039	-0.090	-0.052	-0.116	-0.049	-0.134*	-0.039	-0.165
	(0.087)	(0.107)	(0.195)	(0.177)	(0.065)	(0.147)	(0.073)	(0.070)	(0.076)	(0.071)	(0.072)	(0.080)	(0.056)	(0.113)
Drought	-0.129	-0.184	-0.123	-0.184	-0.182	-0.079	-0.073	-0.177	-0.119	-0.238	-0.116	-0.255	-0.176	-0.153
	(0.100)	(0.092)	(0.118)	(0.115)	(0.079)	(0.149)	(0.125)	(0.070)	(0.094)	(0.097)	(0.092)	(0.114)	(0.081)	(0.113)
Prec	0.090	-0.073	0.242	0.201	0.012	-0.106	0.035	-0.006	0.017	-0.030	0.038	-0.077	0.013	-0.026
	(0.098)	(0.110)	(0.120)	(0.097)	(0.070)	(0.208)	(0.109)	(0.073)	(0.098)	(0.088)	(0.097)	(0.099)	(0.070)	(0.120)
Wind	-0.041	-0.140*	-0.014	-0.060	-0.096	-0.061	-0.015	-0.100	-0.050	-0.159	-0.042	-0.185	-0.089	-0.093
	(0.046)	(0.072)	(0.083)	(0.093)	(0.044)	(0.100)	(0.060)	(0.047)	(0.047)	(0.067)	(0.038)	(0.084)	(0.040)	(0.074)
Fire	0.003	-0.052*	0.077*	0.033	-0.026	-0.064	-0.005	-0.033	-0.014	-0.054*	-0.007	-0.072	-0.029	-0.032
	(0.041)	(0.030)	(0.046)	(0.041)	(0.034)	(0.057)	(0.045)	(0.031)	(0.038)	(0.029)	(0.037)	(0.030)	(0.037)	(0.033)
Hail	0.054	0.168	0.132	0.091	0.118	0.064	0.004	0.120	0.081	0.153*	0.075	0.172*	0.067	0.165
	(0.051)	(0.063)	(0.092)	(0.093)	(0.050)	(0.097)	(0.067)	(0.048)	(0.055)	(0.079)	(0.051)	(0.088)	(0.049)	(0.071)

Panel O: labor force (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	0.041	-0.015	-0.107	-0.154	0.004	0.034	-0.013	0.010	0.033	-0.033	0.017	-0.009	0.020	-0.011
	(0.044)	(0.053)	(0.102)	(0.118)	(0.045)	(0.087)	(0.050)	(0.043)	(0.038)	(0.054)	(0.032)	(0.068)	(0.044)	(0.053)
MaxT	0.026	-0.007	-0.064	-0.096	0.006	0.007	-0.000	0.007	0.021	-0.017	0.010	-0.001	0.013	-0.005
	(0.027)	(0.032)	(0.071)	(0.082)	(0.025)	(0.064)	(0.031)	(0.024)	(0.022)	(0.030)	(0.019)	(0.037)	(0.026)	(0.031)
MinT †	0.114	-0.214*	-0.213	-0.391	0.019	-0.397	0.025	-0.031	0.012	-0.088	-0.012	-0.054	0.051	-0.213*
	(0.091)	(0.128)	(0.209)	(0.243)	(0.080)	(0.185)	(0.092)	(0.082)	(0.076)	(0.098)	(0.067)	(0.120)	(0.073)	(0.123)
Drought	0.036	-0.045	-0.098	-0.048	-0.051	0.227	0.016	-0.011	0.084	-0.147	0.022	-0.060	-0.012	-0.002
	(0.123)	(0.156)	(0.142)	(0.172)	(0.141)	(0.225)	(0.171)	(0.122)	(0.108)	(0.160)	(0.090)	(0.196)	(0.142)	(0.164)
Prec	0.050	-0.003	0.006	-0.170	0.021	-0.083	-0.127	0.025	0.018	-0.006	0.016	-0.005	0.036	-0.037
	(0.122)	(0.123)	(0.131)	(0.143)	(0.090)	(0.142)	(0.085)	(0.087)	(0.087)	(0.100)	(0.077)	(0.121)	(0.105)	(0.128)
Wind	0.025	-0.076	-0.135	-0.179	-0.036	0.020	-0.110	-0.017	0.018	-0.102	-0.005	-0.068	0.003	-0.070
	(0.073)	(0.109)	(0.105)	(0.138)	(0.087)	(0.138)	(0.103)	(0.083)	(0.068)	(0.107)	(0.054)	(0.137)	(0.078)	(0.105)
Fire	0.060	0.031	0.038	0.018	0.027	0.155	0.028	0.042	0.066	0.004	0.051	0.023	0.042	0.038
	(0.048)	(0.041)	(0.097)	(0.117)	(0.044)	(0.076)	(0.050)	(0.040)	(0.043)	(0.049)	(0.036)	(0.059)	(0.049)	(0.042)
Hail	0.014	0.061	0.129	0.214	0.044	-0.015	-0.024	0.041	-0.022	0.127	0.026	0.049	0.034	0.034
	(0.067)	(0.120)	(0.149)	(0.189)	(0.073)	(0.206)	(0.099)	(0.072)	(0.059)	(0.097)	(0.050)	(0.119)	(0.073)	(0.118)

Panel P: entry margin (excess labor force growth over employment growth)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.004	-0.097	0.053	0.023	-0.047	-0.074	0.001	-0.057*	-0.028	-0.087	-0.019	-0.111	-0.037	-0.071
	(0.037)	(0.045)	(0.077)	(0.080)	(0.032)	(0.071)	(0.040)	(0.033)	(0.036)	(0.039)	(0.033)	(0.046)	(0.031)	(0.047)
MaxT	0.003	-0.057	0.067	0.054	-0.024	-0.044	0.003	-0.030	-0.015	-0.044*	-0.009	-0.059	-0.016	-0.044
	(0.024)	(0.027)	(0.053)	(0.053)	(0.020)	(0.043)	(0.025)	(0.021)	(0.023)	(0.023)	(0.021)	(0.026)	(0.020)	(0.028)
MinT †	-0.027	-0.176	-0.137	-0.144	-0.095	-0.015	0.043	-0.102	-0.059	-0.133	-0.057	-0.153	-0.046	-0.187
	(0.096)	(0.125)	(0.220)	(0.201)	(0.074)	(0.171)	(0.079)	(0.080)	(0.085)	(0.084)	(0.080)	(0.095)	(0.062)	(0.133)

Drought	-0.139 (0.108)	-0.219 (0.109)	-0.133 (0.132)	-0.217 (0.132)	-0.206 (0.087)	-0.101 (0.179)	-0.074 (0.135)	-0.204 (0.080)	-0.131 (0.109)	-0.280 (0.112)	-0.127 (0.102)	-0.304 (0.137)	-0.198 (0.088)	-0.179 (0.133)
Prec	0.099 (0.105)	-0.082 (0.128)	0.264* (0.136)	0.234 (0.112)	0.014 (0.076)	-0.137 (0.242)	0.040 (0.117)	-0.008 (0.082)	0.019 (0.110)	-0.037 (0.105)	0.039 (0.107)	-0.085 (0.119)	0.012 (0.077)	-0.029 (0.141)
Wind	-0.044 (0.050)	-0.167 (0.085)	-0.017 (0.093)	-0.071 (0.106)	-0.109 (0.048)	-0.087 (0.120)	-0.012 (0.065)	-0.117 (0.053)	-0.055 (0.052)	-0.191 (0.078)	-0.046 (0.042)	-0.222 (0.099)	-0.102 (0.043)	-0.111 (0.087)
Fire	0.003 (0.045)	-0.059 (0.036)	0.086* (0.050)	0.039 (0.046)	-0.029 (0.037)	-0.076 (0.065)	-0.004 (0.048)	-0.038 (0.035)	-0.015 (0.042)	-0.062* (0.033)	-0.008 (0.040)	-0.081 (0.036)	-0.033 (0.040)	-0.036 (0.038)
Hail	0.058 (0.056)	0.199 (0.076)	0.152 (0.103)	0.110 (0.105)	0.137 (0.056)	0.074 (0.113)	0.005 (0.073)	0.139 (0.056)	0.094 (0.063)	0.178* (0.096)	0.084 (0.058)	0.204* (0.107)	0.077 (0.055)	0.192 (0.084)

The table reports estimates from asymmetric dynamic panel regressions. All specifications include Autometrics-selected country fixed effects and macro-financial controls for economic uncertainty, geopolitical risk, financial stress and business cycle conditions. The conditioning variable is climate risk (Median), computed from the E3CI composite index and from each of its components. It is interacted with pairs of dummies partitioning countries according to whether they stand above or below the annual cross-country mean of the Notre Dame Global Adaptation Index (Adaptation), of the CCPI-mm mitigation index (Mitigation), of real per capita GDP (Income) and of average temperature (Temperature), and, in addition, according to EU membership (Institutions) and geographical position (Latitude: North/South; Longitude: West/East). Coefficients are scaled by the pooled standard deviation of the annual within-country change of the underlying series, so that they measure the impact of a typical annual change. The climate measures are per-country GETS. Bold figures denote significance at the 10% level or better; an asterisk marks significance at 10% but not 5%.

Table A7-C: Dynamic panel regressions with GETS-Autometrics country fixed effects and macro-fin control variables: Asymmetric models, relative climate risk (Median/IQR) (per-country GETS measures)

Panel A: real GDP growth rate														
	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.174 (0.115)	-0.210 (0.143)	-0.684* (0.385)	-0.739* (0.393)	-0.215 (0.135)	-0.184 (0.181)	-0.108 (0.154)	-0.221* (0.134)	-0.196* (0.117)	-0.234 (0.156)	-0.228 (0.113)	-0.181 (0.174)	-0.171 (0.135)	-0.277* (0.142)
MaxT	-0.127 (0.118)	-0.158 (0.161)	-0.657* (0.393)	-0.736* (0.420)	-0.172 (0.128)	-0.092 (0.187)	-0.065 (0.140)	-0.172 (0.134)	-0.137 (0.119)	-0.200 (0.152)	-0.165 (0.115)	-0.154 (0.172)	-0.126 (0.124)	-0.234 (0.161)
MinT †	-0.503 (0.309)	-0.536 (0.386)	-1.052 (0.694)	-1.187* (0.709)	-0.487* (0.292)	-0.283 (0.487)	-0.485* (0.270)	-0.458 (0.308)	-0.421 (0.299)	-0.523 (0.320)	-0.501* (0.292)	-0.394 (0.352)	-0.396 (0.293)	-0.588 (0.387)
Drought	-0.404 (0.406)	-0.625* (0.375)	-0.651 (0.627)	-0.515 (0.612)	-0.363 (0.393)	-0.795* (0.461)	0.140 (0.480)	-0.504 (0.354)	-0.411 (0.367)	-0.493 (0.369)	-0.471 (0.378)	-0.400 (0.410)	-0.305 (0.356)	-0.623 (0.403)
Prec	-0.045 (0.407)	-0.066 (0.432)	0.197 (0.558)	-0.041 (0.511)	-0.257 (0.364)	-0.103 (0.574)	-0.297 (0.491)	-0.227 (0.350)	-0.227 (0.365)	-0.255 (0.385)	-0.226 (0.369)	-0.245 (0.414)	-0.203 (0.353)	-0.289 (0.436)
Wind	-0.357 (0.182)	-0.494* (0.260)	-0.635 (0.413)	-0.607 (0.413)	-0.402* (0.229)	-0.560 (0.391)	-0.251 (0.194)	-0.448* (0.239)	-0.382 (0.183)	-0.505* (0.294)	-0.410 (0.171)	-0.459 (0.328)	-0.355 (0.217)	-0.539 (0.253)
Fire	-0.276 (0.188)	-0.206 (0.222)	-0.367 (0.773)	-0.259 (0.845)	-0.239 (0.252)	-0.363 (0.233)	-0.105 (0.229)	-0.276 (0.230)	-0.281 (0.204)	-0.226 (0.262)	-0.354* (0.188)	-0.108 (0.307)	-0.219 (0.247)	-0.323 (0.217)
Hail	0.271 (0.170)	0.458 (0.198)	0.748* (0.446)	0.970 (0.438)	0.316* (0.183)	0.540 (0.344)	-0.159 (0.304)	0.413 (0.178)	0.328* (0.188)	0.412 (0.189)	0.349 (0.172)	0.380 (0.233)	0.244 (0.188)	0.517 (0.222)
Panel B: real consumption growth rate														
	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.268* (0.148)	-0.268 (0.127)	-0.879* (0.462)	-0.895 (0.421)	-0.229 (0.139)	-0.300 (0.195)	-0.197 (0.126)	-0.245 (0.120)	-0.231* (0.126)	-0.255* (0.150)	-0.271 (0.119)	-0.188 (0.161)	-0.209 (0.156)	-0.292 (0.127)
MaxT	-0.221 (0.139)	-0.270 (0.123)	-0.812* (0.456)	-0.865 (0.406)	-0.198 (0.125)	-0.226 (0.162)	-0.103 (0.165)	-0.213* (0.113)	-0.176 (0.125)	-0.245* (0.140)	-0.199* (0.120)	-0.207 (0.160)	-0.165 (0.137)	-0.283 (0.118)
MinT †	-0.611* (0.340)	-0.449 (0.411)	-1.206* (0.699)	-1.219* (0.725)	-0.420 (0.307)	-0.313 (0.568)	-0.420 (0.369)	-0.415 (0.304)	-0.369 (0.301)	-0.369 (0.342)	-0.475* (0.286)	-0.291 (0.385)	-0.381 (0.327)	-0.455 (0.392)
Drought	-0.404 (0.490)	-0.417 (0.386)	-0.385 (0.702)	-0.265 (0.603)	-0.268 (0.455)	-0.920* (0.559)	-0.523 (0.523)	-0.372 (0.375)	-0.436 (0.425)	-0.312 (0.402)	-0.499 (0.424)	-0.211 (0.441)	-0.325 (0.444)	-0.467 (0.434)
Prec	-0.315 (0.436)	-0.283 (0.424)	-0.157 (0.574)	-0.265 (0.579)	-0.298 (0.393)	-0.298 (0.642)	-0.199 (0.455)	-0.308 (0.359)	-0.251 (0.414)	-0.371 (0.388)	-0.305 (0.410)	-0.285 (0.398)	-0.281 (0.377)	-0.327 (0.462)
Wind	-0.517* (0.270)	-0.409 (0.249)	-0.633 (0.486)	-0.592 (0.422)	-0.368 (0.254)	-0.669* (0.365)	-0.626 (0.311)	-0.396* (0.222)	-0.418* (0.217)	-0.418 (0.285)	-0.483 (0.200)	-0.315 (0.311)	-0.417 (0.288)	-0.420* (0.221)
Fire	-0.322 (0.246)	-0.263 (0.188)	-0.413 (0.912)	-0.274 (0.821)	-0.268 (0.254)	-0.368 (0.307)	-0.167 (0.324)	-0.297 (0.209)	-0.300 (0.225)	-0.261 (0.226)	-0.363* (0.207)	-0.158 (0.266)	-0.233 (0.285)	-0.366* (0.212)
Hail	0.380 (0.171)	0.703 (0.218)	0.702 (0.499)	0.994 (0.502)	0.436 (0.189)	0.889 (0.421)	0.247 (0.201)	0.555 (0.159)	0.528 (0.154)	0.524 (0.233)	0.529 (0.137)	0.523* (0.284)	0.389 (0.189)	0.712 (0.217)
Panel C: real investment growth rate														
	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.194 (0.260)	-0.251 (0.293)	-0.396 (0.844)	-0.303 (0.810)	0.058 (0.199)	-1.062* (0.558)	-0.297 (0.645)	-0.095 (0.181)	-0.210 (0.206)	0.041 (0.184)	-0.243 (0.209)	0.096 (0.207)	0.074 (0.244)	-0.427 (0.356)
MaxT	-0.239 (0.248)	-0.404 (0.302)	-0.580 (0.936)	-0.656 (0.891)	0.003 (0.182)	-1.321 (0.462)	-0.258 (0.545)	-0.165 (0.177)	-0.260 (0.190)	-0.033 (0.196)	-0.267 (0.196)	-0.015 (0.214)	0.016 (0.217)	-0.559 (0.374)
MinT †	-1.028 (0.653)	-0.757 (0.886)	-0.579 (1.666)	0.002 (1.738)	-0.219 (0.571)	-2.074 (1.514)	-1.933* (1.081)	-0.300 (0.599)	-0.638 (0.636)	-0.173 (0.569)	-0.841 (0.603)	0.193 (0.664)	-0.317 (0.566)	-0.722 (0.998)
Drought	-0.064 (0.631)	0.248 (0.652)	-0.089 (0.865)	0.520 (0.929)	0.224 (0.543)	-0.436 (1.194)	-2.243 (1.039)	0.341 (0.459)	-0.116 (0.578)	0.428 (0.587)	-0.352 (0.603)	0.806 (0.773)	-0.041 (0.698)	0.282 (0.844)
Prec	-0.312 (0.619)	-1.006 (1.038)	-0.551 (1.056)	-1.074 (1.176)	-0.052 (0.476)	-2.134 (2.071)	1.273 (1.900)	-0.529 (0.536)	-0.453 (0.688)	-0.210 (0.569)	-0.309 (0.739)	-0.439 (0.704)	0.426 (0.526)	-1.729 (1.294)
Wind	-0.122 (0.351)	-0.109 (0.388)	-0.227 (0.711)	0.271 (0.675)	0.134 (0.259)	-0.807 (0.828)	-0.492 (1.143)	0.027 (0.243)	-0.117 (0.262)	0.131 (0.306)	-0.223 (0.272)	0.297 (0.388)	0.148 (0.361)	-0.273 (0.476)
Fire	-0.292 (0.453)	-0.042 (0.394)	0.545 (1.056)	0.911 (1.001)	0.167 (0.361)	-1.023 (0.741)	-0.931 (0.964)	0.060 (0.324)	-0.273 (0.402)	0.335 (0.336)	-0.333 (0.399)	0.446 (0.366)	0.091 (0.424)	-0.232 (0.479)
Hail	0.119 (0.413)	0.794 (0.535)	0.237 (0.903)	0.628 (0.832)	0.035 (0.441)	2.233 (0.882)	0.177 (0.909)	0.507 (0.392)	0.600 (0.457)	0.277 (0.461)	0.639 (0.465)	0.213 (0.573)	0.101 (0.514)	0.982 (0.664)
Panel D: employed persons (growth rate)														
	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	0.051 (0.071)	0.097 (0.073)	-0.151 (0.201)	-0.199 (0.224)	0.052 (0.064)	0.103 (0.089)	0.017 (0.066)	0.065 (0.059)	0.053 (0.064)	0.071 (0.063)	0.036 (0.052)	0.100 (0.087)	0.054 (0.060)	0.071 (0.074)

MaxT	0.056 (0.071)	0.079 (0.072)	-0.078 (0.236)	-0.137 (0.257)	0.050 (0.059)	0.061 (0.086)	0.039 (0.062)	0.053 (0.055)	0.051 (0.058)	0.053 (0.059)	0.040 (0.048)	0.071 (0.082)	0.046 (0.055)	0.063 (0.071)
MinT †	0.185 (0.216)	-0.023 (0.216)	0.015 (0.383)	-0.245 (0.410)	0.136 (0.161)	-0.241 (0.285)	0.015 (0.171)	0.095 (0.161)	0.101 (0.179)	0.067 (0.156)	0.056 (0.155)	0.141 (0.193)	0.130 (0.156)	0.006 (0.210)
Drought	0.177 (0.171)	0.256 (0.218)	0.151 (0.221)	0.279 (0.230)	0.175 (0.178)	0.409* (0.234)	0.124 (0.174)	0.227 (0.160)	0.218 (0.164)	0.217 (0.199)	0.141 (0.133)	0.338 (0.269)	0.201 (0.162)	0.239 (0.246)
Prec	-0.047 (0.175)	0.032 (0.251)	-0.345 (0.216)	-0.519 (0.261)	-0.011 (0.147)	-0.040 (0.369)	-0.087 (0.186)	-0.008 (0.146)	-0.032 (0.152)	0.011 (0.185)	-0.022 (0.146)	-0.004 (0.221)	0.013 (0.133)	-0.064 (0.246)
Wind	0.098 (0.117)	0.130 (0.157)	-0.025 (0.195)	-0.043 (0.227)	0.092 (0.124)	0.114 (0.149)	-0.034 (0.105)	0.110 (0.120)	0.080 (0.112)	0.121 (0.145)	0.052 (0.085)	0.167 (0.196)	0.117 (0.107)	0.063 (0.161)
Fire	0.130 (0.133)	0.186* (0.103)	0.213 (0.327)	0.212 (0.357)	0.120 (0.119)	0.252 (0.110)	0.115 (0.133)	0.145 (0.102)	0.137 (0.119)	0.150 (0.096)	0.093 (0.095)	0.222 (0.140)	0.126 (0.118)	0.167 (0.111)
Hail	-0.043 (0.093)	-0.184 (0.147)	-0.154 (0.203)	0.032 (0.257)	-0.092 (0.101)	-0.171 (0.217)	-0.066 (0.091)	-0.112 (0.095)	-0.096 (0.081)	-0.128 (0.141)	-0.054 (0.071)	-0.195 (0.176)	-0.040 (0.093)	-0.201 (0.152)

Panel E: hours worked per employed person (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	0.028 (0.069)	0.013 (0.088)	-0.333 (0.303)	-0.339 (0.295)	-0.035 (0.098)	0.105 (0.073)	0.006 (0.094)	-0.021 (0.093)	-0.023 (0.074)	-0.012 (0.125)	-0.016 (0.081)	-0.023 (0.120)	-0.025 (0.104)	-0.007 (0.073)
MaxT	0.017 (0.064)	0.004 (0.096)	-0.274 (0.313)	-0.257 (0.309)	-0.033 (0.086)	0.084 (0.091)	-0.001 (0.082)	-0.023 (0.084)	-0.026 (0.066)	-0.013 (0.115)	-0.019 (0.071)	-0.024 (0.116)	-0.026 (0.089)	-0.010 (0.075)
MinT †	-0.019 (0.179)	-0.094 (0.207)	-0.436 (0.400)	-0.405 (0.383)	-0.074 (0.196)	-0.136 (0.176)	-0.064 (0.190)	-0.082 (0.189)	-0.078 (0.171)	-0.084 (0.227)	-0.069 (0.178)	-0.106 (0.221)	-0.089 (0.203)	-0.061 (0.164)
Drought	-0.079 (0.177)	-0.269 (0.269)	-0.357 (0.288)	-0.326 (0.319)	-0.172 (0.211)	-0.162 (0.282)	0.052 (0.208)	-0.196 (0.201)	-0.117 (0.136)	-0.248 (0.309)	-0.080 (0.161)	-0.339 (0.300)	-0.083 (0.221)	-0.289 (0.187)
Prec	0.095 (0.154)	0.284 (0.221)	0.136 (0.266)	0.034 (0.213)	0.010 (0.181)	0.434 (0.283)	-0.015 (0.204)	0.073 (0.182)	0.011 (0.157)	0.144 (0.234)	0.003 (0.157)	0.190 (0.259)	-0.026 (0.195)	0.233 (0.179)
Wind	-0.091 (0.155)	-0.077 (0.195)	-0.357 (0.264)	-0.384 (0.261)	-0.148 (0.196)	0.076 (0.141)	-0.039 (0.185)	-0.126 (0.187)	-0.106 (0.144)	-0.134 (0.261)	-0.097 (0.163)	-0.156 (0.240)	-0.116 (0.203)	-0.117 (0.162)
Fire	0.088 (0.106)	0.032 (0.152)	-0.219 (0.479)	-0.201 (0.476)	-0.012 (0.169)	0.083 (0.127)	0.026 (0.153)	-0.002 (0.155)	-0.006 (0.122)	0.012 (0.209)	0.008 (0.135)	-0.011 (0.202)	-0.000 (0.180)	0.004 (0.119)
Hail	-0.000 (0.078)	0.149 (0.125)	0.310 (0.236)	0.224 (0.214)	0.101 (0.090)	-0.003 (0.151)	-0.045 (0.114)	0.098 (0.083)	0.076 (0.064)	0.095 (0.138)	0.045 (0.070)	0.159 (0.153)	0.030 (0.089)	0.164* (0.094)

Panel F: labor productivity – output per worker (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.269 (0.091)	-0.449 (0.110)	-0.598 (0.243)	-0.511 (0.230)	-0.367 (0.093)	-0.364 (0.143)	-0.169 (0.151)	-0.388 (0.095)	-0.340 (0.088)	-0.409 (0.113)	-0.348 (0.091)	-0.398 (0.115)	-0.280 (0.097)	-0.522 (0.111)
MaxT	-0.232 (0.088)	-0.391 (0.142)	-0.586 (0.224)	-0.506 (0.234)	-0.311 (0.095)	-0.257* (0.149)	-0.144 (0.125)	-0.322 (0.103)	-0.277 (0.094)	-0.348 (0.117)	-0.284 (0.094)	-0.338 (0.122)	-0.224 (0.090)	-0.487 (0.146)
MinT †	-0.727 (0.224)	-0.608 (0.286)	-0.852* (0.447)	-0.668 (0.434)	-0.727 (0.212)	-0.096 (0.351)	-0.550 (0.256)	-0.658 (0.228)	-0.637 (0.232)	-0.664 (0.245)	-0.655 (0.232)	-0.635 (0.246)	-0.607 (0.212)	-0.731 (0.301)
Drought	-0.566 (0.347)	-0.889 (0.309)	-0.550 (0.441)	-0.489 (0.355)	-0.558 (0.362)	-1.097 (0.435)	0.058 (0.470)	-0.731 (0.328)	-0.614* (0.337)	-0.722 (0.339)	-0.560 (0.343)	-0.808 (0.334)	-0.459 (0.327)	-0.908 (0.387)
Prec	-0.092 (0.372)	-0.372 (0.354)	0.206 (0.488)	0.256 (0.331)	-0.442 (0.302)	-0.215 (0.391)	-0.310 (0.434)	-0.418 (0.288)	-0.370 (0.302)	-0.464 (0.304)	-0.396 (0.304)	-0.426 (0.318)	-0.340 (0.286)	-0.536 (0.357)
Wind	-0.469 (0.125)	-0.741 (0.145)	-0.564 (0.239)	-0.445* (0.235)	-0.594 (0.135)	-0.701 (0.232)	-0.228 (0.198)	-0.654 (0.150)	-0.537 (0.121)	-0.736 (0.178)	-0.523 (0.125)	-0.756 (0.171)	-0.515 (0.143)	-0.759 (0.168)
Fire	-0.461 (0.148)	-0.598 (0.151)	-0.451 (0.535)	-0.308 (0.548)	-0.545 (0.170)	-0.607 (0.198)	-0.296 (0.221)	-0.584 (0.160)	-0.572 (0.149)	-0.531 (0.190)	-0.583 (0.143)	-0.510 (0.208)	-0.434 (0.169)	-0.758 (0.164)
Hail	0.377 (0.135)	0.819 (0.195)	0.720 (0.344)	0.728 (0.258)	0.536 (0.177)	0.685 (0.259)	-0.037 (0.307)	0.628 (0.168)	0.513 (0.174)	0.653 (0.180)	0.463 (0.156)	0.736 (0.211)	0.298* (0.163)	0.934 (0.222)

Panel G: labor productivity – output per hour worked (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.256 (0.090)	-0.434 (0.090)	-0.252 (0.279)	-0.193 (0.257)	-0.309 (0.078)	-0.494 (0.134)	-0.141 (0.173)	-0.358 (0.066)	-0.323 (0.084)	-0.349 (0.078)	-0.322 (0.082)	-0.356 (0.089)	-0.246 (0.081)	-0.523 (0.087)
MaxT	-0.224 (0.087)	-0.373 (0.098)	-0.282 (0.272)	-0.253 (0.261)	-0.271 (0.071)	-0.353 (0.137)	-0.123 (0.140)	-0.301 (0.066)	-0.271 (0.078)	-0.294 (0.074)	-0.270 (0.076)	-0.304 (0.088)	-0.202 (0.066)	-0.503 (0.105)
MinT †	-0.463 (0.222)	-0.276 (0.268)	-0.223 (0.412)	-0.083 (0.381)	-0.468 (0.169)	0.026 (0.429)	-0.319 (0.271)	-0.431 (0.181)	-0.467 (0.198)	-0.343* (0.197)	-0.485 (0.196)	-0.271 (0.221)	-0.374 (0.171)	-0.519* (0.266)
Drought	-0.298 (0.283)	-0.427 (0.314)	0.033 (0.362)	0.106 (0.264)	-0.198 (0.276)	-0.874 (0.573)	0.148 (0.504)	-0.361 (0.270)	-0.318 (0.299)	-0.294 (0.297)	-0.322 (0.284)	-0.284 (0.340)	-0.229 (0.276)	-0.417 (0.384)
Prec	-0.204 (0.321)	-0.723 (0.350)	-0.177 (0.420)	-0.075 (0.334)	-0.507 (0.222)	-0.729 (0.560)	-0.328 (0.373)	-0.561 (0.226)	-0.491 (0.242)	-0.605 (0.255)	-0.464 (0.233)	-0.687 (0.291)	-0.378* (0.215)	-0.865 (0.343)

Wind	-0.237* (0.140)	-0.568 (0.184)	-0.072 (0.243)	0.058 (0.199)	-0.335 (0.133)	-0.842 (0.244)	-0.083 (0.330)	-0.448 (0.115)	-0.351 (0.138)	-0.500 (0.147)	-0.342 (0.131)	-0.542 (0.165)	-0.324 (0.149)	-0.549 (0.172)
Fire	-0.484 (0.123)	-0.531 (0.133)	-0.276 (0.378)	-0.194 (0.353)	-0.493 (0.116)	-0.580 (0.249)	-0.275 (0.255)	-0.535 (0.098)	-0.559 (0.131)	-0.423 (0.104)	-0.555 (0.123)	-0.405 (0.141)	-0.402 (0.118)	-0.707 (0.151)
Hail	0.293 (0.126)	0.587 (0.174)	0.184 (0.310)	0.257 (0.195)	0.348 (0.130)	0.656 (0.326)	-0.058 (0.317)	0.455 (0.132)	0.357 (0.153)	0.472 (0.146)	0.364 (0.130)	0.480 (0.188)	0.222 (0.145)	0.680 (0.203)

Panel H: real product wage (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.228 (0.074)	-0.380 (0.130)	-0.126 (0.216)	-0.157 (0.199)	-0.186 (0.072)	-0.772 (0.198)	-0.055 (0.198)	-0.288 (0.079)	-0.282 (0.085)	-0.229 (0.097)	-0.265 (0.070)	-0.260 (0.109)	-0.190 (0.054)	-0.421 (0.162)
MaxT	-0.197 (0.080)	-0.435 (0.118)	-0.367* (0.221)	-0.384* (0.210)	-0.184 (0.066)	-0.774 (0.221)	-0.085 (0.160)	-0.266 (0.071)	-0.268 (0.080)	-0.204 (0.087)	-0.241 (0.067)	-0.257 (0.097)	-0.149 (0.048)	-0.522 (0.152)
MinT †	-0.486 (0.227)	-0.581 (0.358)	-0.682 (0.293)	-0.603 (0.308)	-0.440 (0.203)	-0.569 (0.601)	-0.429 (0.431)	-0.454 (0.210)	-0.508 (0.230)	-0.350 (0.219)	-0.445 (0.191)	-0.465* (0.266)	-0.357 (0.147)	-0.696 (0.460)
Drought	-0.398* (0.208)	-0.815 (0.299)	-0.254 (0.295)	-0.290 (0.280)	-0.369* (0.191)	-1.802 (0.713)	-1.024* (0.534)	-0.541 (0.211)	-0.562* (0.311)	-0.634 (0.238)	-0.588 (0.264)	-0.590 (0.254)	-0.376* (0.195)	-0.900 (0.406)
Prec	-0.311 (0.133)	-0.041 (0.426)	0.121 (0.293)	0.197 (0.281)	-0.106 (0.139)	-0.408 (0.922)	0.345 (0.541)	-0.194 (0.221)	-0.153 (0.197)	-0.122 (0.278)	-0.155 (0.158)	-0.117 (0.310)	-0.258 (0.117)	0.105 (0.513)
Wind	-0.420 (0.150)	-0.516 (0.180)	-0.233 (0.267)	-0.223 (0.243)	-0.331 (0.106)	-0.920 (0.367)	-0.187 (0.327)	-0.438 (0.122)	-0.324 (0.153)	-0.572 (0.099)	-0.353 (0.135)	-0.521 (0.137)	-0.379 (0.108)	-0.469 (0.232)
Fire	-0.286 (0.122)	-0.589 (0.208)	0.083 (0.306)	-0.013 (0.239)	-0.282 (0.128)	-1.113 (0.426)	-0.338 (0.349)	-0.409 (0.130)	-0.480 (0.161)	-0.264* (0.148)	-0.463 (0.124)	-0.289 (0.178)	-0.248 (0.095)	-0.704 (0.257)
Hail	0.286 (0.107)	0.909 (0.191)	0.479 (0.225)	0.467* (0.254)	0.334 (0.111)	1.442 (0.333)	0.105 (0.272)	0.576 (0.105)	0.525 (0.139)	0.538 (0.179)	0.488 (0.112)	0.609 (0.207)	0.254 (0.098)	0.956 (0.221)

Panel I: real consumption wage (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.226 (0.088)	-0.203 (0.168)	-0.079 (0.243)	-0.092 (0.234)	-0.059 (0.089)	-0.700 (0.267)	-0.206 (0.068)	-0.127 (0.102)	-0.146 (0.103)	-0.115 (0.119)	-0.156* (0.087)	-0.094 (0.142)	-0.122* (0.068)	-0.161 (0.217)
MaxT	-0.191 (0.092)	-0.250 (0.156)	-0.392* (0.226)	-0.447* (0.244)	-0.072 (0.079)	-0.616 (0.302)	-0.134* (0.070)	-0.120 (0.088)	-0.117 (0.088)	-0.129 (0.106)	-0.117 (0.077)	-0.131 (0.129)	-0.082 (0.060)	-0.226 (0.204)
MinT †	-0.518 (0.251)	-0.391 (0.453)	-0.618* (0.351)	-0.741* (0.409)	-0.293 (0.262)	-0.103 (0.651)	-0.294* (0.164)	-0.275 (0.270)	-0.266 (0.264)	-0.297 (0.270)	-0.256 (0.221)	-0.318 (0.349)	-0.245 (0.171)	-0.357 (0.594)
Drought	-0.277 (0.241)	-0.756 (0.352)	-0.139 (0.262)	-0.384 (0.317)	-0.320 (0.235)	-1.521 (0.765)	-0.318 (0.236)	-0.527 (0.264)	-0.438 (0.337)	-0.620 (0.270)	-0.459 (0.302)	-0.588* (0.329)	-0.308 (0.230)	-0.795* (0.477)
Prec	-0.369 (0.155)	0.249 (0.404)	0.039 (0.305)	0.345 (0.260)	0.095 (0.158)	-0.362 (0.820)	-0.365 (0.301)	0.089 (0.198)	-0.018 (0.200)	0.155 (0.274)	-0.055 (0.176)	0.235 (0.346)	-0.142 (0.149)	0.443 (0.486)
Wind	-0.403 (0.184)	-0.325 (0.257)	-0.219 (0.294)	-0.182 (0.460)	-0.172 (0.147)	-0.854* (0.181)	-0.423 (0.169)	-0.245 (0.169)	-0.195 (0.192)	-0.382 (0.161)	-0.250 (0.164)	-0.285 (0.207)	-0.300 (0.141)	-0.200 (0.321)
Fire	-0.292 (0.148)	-0.371 (0.250)	0.103 (0.322)	-0.047 (0.282)	-0.109 (0.163)	-1.042 (0.392)	-0.277 (0.107)	-0.234 (0.176)	-0.297 (0.182)	-0.134 (0.184)	-0.319 (0.149)	-0.090 (0.235)	-0.153 (0.115)	-0.397 (0.335)
Hail	0.218* (0.115)	0.704 (0.223)	0.440* (0.231)	0.503 (0.332)	0.219 (0.147)	1.304 (0.363)	0.107 (0.150)	0.437 (0.147)	0.395 (0.155)	0.423 (0.212)	0.372 (0.126)	0.467* (0.268)	0.210* (0.121)	0.705 (0.273)

Panel L: real wage wedge (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.027 (0.059)	0.079 (0.067)	0.082 (0.128)	0.057 (0.121)	0.056 (0.034)	0.014 (0.124)	-0.113 (0.207)	0.069 (0.044)	0.033 (0.040)	0.084 (0.055)	0.029 (0.045)	0.091 (0.059)	0.024 (0.044)	0.104 (0.075)
MaxT	-0.013 (0.047)	0.061 (0.071)	0.008 (0.123)	-0.064 (0.127)	0.045 (0.029)	0.047 (0.142)	-0.009 (0.175)	0.051 (0.039)	0.044 (0.033)	0.047 (0.048)	0.039 (0.036)	0.058 (0.055)	0.031 (0.034)	0.080 (0.080)
MinT †	-0.048 (0.106)	0.044 (0.175)	0.054 (0.185)	-0.127 (0.172)	0.053 (0.079)	0.195 (0.275)	0.177 (0.426)	0.052 (0.111)	0.083 (0.078)	0.032 (0.127)	0.063 (0.083)	0.068 (0.142)	0.062 (0.077)	0.073 (0.200)
Drought	0.149 (0.157)	0.123 (0.149)	0.288* (0.171)	0.035 (0.179)	0.104 (0.110)	0.193 (0.214)	0.695 (0.566)	0.053 (0.126)	0.151 (0.123)	0.061 (0.174)	0.158 (0.139)	0.046 (0.184)	0.065 (0.127)	0.194 (0.167)
Prec	-0.139 (0.178)	0.075 (0.179)	-0.197 (0.180)	-0.002 (0.125)	0.097 (0.092)	-0.232 (0.372)	-0.857 (0.550)	0.161* (0.092)	-0.015 (0.131)	0.197 (0.143)	-0.025 (0.143)	0.224 (0.164)	0.050 (0.132)	0.081 (0.200)
Wind	0.003 (0.064)	0.135 (0.100)	0.093 (0.105)	0.110 (0.120)	0.107 (0.066)	0.011 (0.176)	-0.232 (0.216)	0.130 (0.083)	0.056 (0.058)	0.163 (0.101)	0.057 (0.065)	0.160 (0.099)	0.037 (0.056)	0.189* (0.106)
Fire	-0.035 (0.089)	0.084 (0.101)	0.156 (0.133)	0.044 (0.183)	0.076 (0.054)	0.015 (0.126)	0.132 (0.364)	0.060 (0.073)	0.063 (0.061)	0.076 (0.088)	0.051 (0.070)	0.098 (0.097)	0.047 (0.067)	0.105 (0.123)
Hail	-0.043 (0.071)	-0.059 (0.076)	-0.118 (0.121)	0.043 (0.109)	-0.056 (0.068)	0.004 (0.175)	-0.049 (0.252)	-0.045 (0.067)	-0.045 (0.068)	-0.045 (0.093)	-0.045 (0.063)	-0.046 (0.101)	-0.005 (0.070)	-0.106 (0.082)

Panel M: labor share (change)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	0.062	0.255*	0.170	0.211	0.178*	0.072	0.004	0.192	0.177*	0.161	0.182*	0.152	0.064	0.416
	(0.102)	(0.145)	(0.203)	(0.162)	(0.099)	(0.276)	(0.301)	(0.089)	(0.107)	(0.105)	(0.103)	(0.130)	(0.090)	(0.174)
MaxT	0.052	0.157	-0.086	-0.048	0.147	-0.217	-0.062	0.156*	0.128	0.137	0.147	0.101	0.061	0.318*
	(0.087)	(0.153)	(0.245)	(0.242)	(0.093)	(0.393)	(0.249)	(0.086)	(0.103)	(0.096)	(0.094)	(0.127)	(0.080)	(0.189)
MinT †	0.157	0.284	-0.261	-0.181	0.282	-0.255	-0.108	0.301	0.202	0.352	0.262	0.244	0.182	0.449
	(0.235)	(0.369)	(0.307)	(0.318)	(0.265)	(0.472)	(0.576)	(0.238)	(0.255)	(0.278)	(0.242)	(0.317)	(0.210)	(0.459)
Drought	-0.073	0.059	-0.033	-0.186	-0.090	-0.007	-1.270	0.061	-0.093	-0.067	-0.028	-0.176	-0.210	0.142
	(0.309)	(0.314)	(0.442)	(0.297)	(0.271)	(1.107)	(0.820)	(0.228)	(0.372)	(0.225)	(0.329)	(0.359)	(0.285)	(0.382)
Prec	0.033	0.749*	0.013	0.311	0.433	0.646	0.772	0.407*	0.477	0.392	0.369	0.586*	0.175	1.099
	(0.337)	(0.396)	(0.457)	(0.298)	(0.271)	(0.839)	(0.865)	(0.243)	(0.318)	(0.266)	(0.309)	(0.339)	(0.258)	(0.489)
Wind	-0.015	0.396	0.012	0.008	0.195	0.471	-0.097	0.252*	0.252	0.148	0.214	0.213	0.030	0.558
	(0.152)	(0.176)	(0.287)	(0.259)	(0.131)	(0.498)	(0.375)	(0.129)	(0.157)	(0.148)	(0.163)	(0.190)	(0.144)	(0.217)
Fire	0.131	0.245	0.089	-0.005	0.216	0.167	-0.218	0.262	0.216	0.203	0.235	0.169	0.091	0.461
	(0.170)	(0.262)	(0.300)	(0.299)	(0.185)	(0.472)	(0.496)	(0.163)	(0.198)	(0.183)	(0.173)	(0.241)	(0.150)	(0.308)
Hail	-0.061	-0.102	0.098	-0.139	-0.131	0.350	0.333	-0.135	-0.076	-0.103	-0.158	0.041	0.035	-0.319
	(0.133)	(0.233)	(0.368)	(0.296)	(0.090)	(0.646)	(0.412)	(0.116)	(0.192)	(0.124)	(0.135)	(0.236)	(0.133)	(0.317)

Panel N: unemployment rate (change)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.005	-0.097	0.069	0.045	-0.047	-0.057	0.001	-0.054*	-0.030	-0.080	-0.021	-0.104	-0.032	-0.078*
	(0.036)	(0.040)	(0.090)	(0.091)	(0.030)	(0.059)	(0.039)	(0.029)	(0.033)	(0.034)	(0.031)	(0.039)	(0.029)	(0.042)
MaxT	-0.009	-0.095	0.022	0.010	-0.041	-0.060	-0.008	-0.048*	-0.032	-0.064	-0.025	-0.083	-0.025	-0.085
	(0.034)	(0.037)	(0.102)	(0.107)	(0.027)	(0.049)	(0.034)	(0.027)	(0.030)	(0.032)	(0.028)	(0.037)	(0.025)	(0.039)
MinT †	-0.027	-0.125	-0.108	-0.145	-0.095	0.039	0.032	-0.094	-0.057	-0.119	-0.055	-0.134	-0.053	-0.136
	(0.103)	(0.118)	(0.213)	(0.204)	(0.083)	(0.185)	(0.097)	(0.088)	(0.097)	(0.085)	(0.092)	(0.094)	(0.076)	(0.125)
Drought	-0.124	-0.195	-0.130	-0.206*	-0.188	-0.071	-0.086	-0.178	-0.115	-0.251	-0.107	-0.283	-0.180	-0.154
	(0.105)	(0.097)	(0.136)	(0.112)	(0.079)	(0.154)	(0.123)	(0.072)	(0.100)	(0.095)	(0.096)	(0.114)	(0.080)	(0.123)
Prec	0.073	-0.071	0.247*	0.224	0.005	-0.080	0.011	-0.008	0.004	-0.022	0.022	-0.061	0.004	-0.023
	(0.104)	(0.127)	(0.134)	(0.108)	(0.073)	(0.216)	(0.113)	(0.077)	(0.103)	(0.102)	(0.101)	(0.118)	(0.070)	(0.140)
Wind	-0.041	-0.148*	-0.013	-0.062	-0.101	-0.054	-0.019	-0.103	-0.051	-0.165	-0.043	-0.194	-0.088	-0.103
	(0.048)	(0.078)	(0.093)	(0.106)	(0.046)	(0.108)	(0.063)	(0.049)	(0.048)	(0.073)	(0.040)	(0.090)	(0.042)	(0.079)
Fire	-0.033	-0.134	-0.020	-0.064	-0.092	-0.066	-0.012	-0.097*	-0.055	-0.140	-0.041	-0.181	-0.073	-0.111*
	(0.068)	(0.054)	(0.139)	(0.130)	(0.057)	(0.084)	(0.070)	(0.050)	(0.064)	(0.051)	(0.059)	(0.056)	(0.056)	(0.064)
Hail	0.045	0.172	0.137	0.093	0.111	0.069	0.011	0.113	0.072	0.153*	0.065	0.177	0.054	0.171
	(0.049)	(0.061)	(0.085)	(0.087)	(0.046)	(0.096)	(0.064)	(0.044)	(0.051)	(0.080)	(0.048)	(0.089)	(0.047)	(0.066)

Panel O: labor force (growth rate)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	0.052	-0.020	-0.140	-0.191	0.010	0.007	-0.011	0.012	0.035	-0.032	0.016	-0.002	0.026	-0.018
	(0.042)	(0.058)	(0.137)	(0.153)	(0.044)	(0.094)	(0.053)	(0.042)	(0.037)	(0.055)	(0.031)	(0.069)	(0.043)	(0.058)
MaxT	0.055	-0.033	-0.116	-0.160	0.015	-0.045	0.009	0.008	0.034	-0.036	0.015	-0.005	0.028	-0.035
	(0.041)	(0.054)	(0.149)	(0.168)	(0.040)	(0.089)	(0.047)	(0.038)	(0.033)	(0.049)	(0.029)	(0.064)	(0.038)	(0.053)
MinT †	0.135	-0.163	-0.170	-0.356	0.044	-0.369	0.032	-0.002	0.051	-0.078	0.013	-0.024	0.072	-0.144
	(0.112)	(0.133)	(0.208)	(0.238)	(0.095)	(0.167)	(0.115)	(0.096)	(0.098)	(0.109)	(0.088)	(0.125)	(0.090)	(0.130)
Drought	0.037	-0.031	-0.101	-0.031	-0.047	0.229	-0.002	-0.000	0.083	-0.126	0.017	-0.032	-0.024	0.030
	(0.127)	(0.165)	(0.157)	(0.179)	(0.140)	(0.212)	(0.172)	(0.123)	(0.110)	(0.156)	(0.091)	(0.196)	(0.133)	(0.173)
Prec	0.044	-0.015	-0.004	-0.192	0.018	-0.116	-0.144	0.018	0.012	-0.017	0.008	-0.015	0.036	-0.062
	(0.137)	(0.146)	(0.152)	(0.177)	(0.105)	(0.245)	(0.154)	(0.098)	(0.097)	(0.115)	(0.083)	(0.143)	(0.111)	(0.153)
Wind	0.040	-0.063	-0.129	-0.171	-0.020	0.014	-0.108	-0.004	0.028	-0.085	0.002	-0.047	0.015	-0.058
	(0.078)	(0.115)	(0.122)	(0.151)	(0.091)	(0.136)	(0.100)	(0.087)	(0.072)	(0.112)	(0.058)	(0.143)	(0.079)	(0.114)
Fire	0.111	0.022	0.100	0.089	0.043	0.105	0.061	0.052	0.102	-0.026	0.060	0.038	0.060	0.041
	(0.074)	(0.082)	(0.231)	(0.267)	(0.079)	(0.136)	(0.102)	(0.069)	(0.069)	(0.086)	(0.056)	(0.107)	(0.078)	(0.086)
Hail	0.002	0.042	0.095	0.180	0.024	-0.001	-0.031	0.025	-0.027	0.096	0.023	0.013	0.026	0.010
	(0.061)	(0.121)	(0.163)	(0.187)	(0.068)	(0.198)	(0.087)	(0.071)	(0.056)	(0.094)	(0.047)	(0.118)	(0.061)	(0.122)

Panel P: entry margin (excess labor force growth over employment growth)

	Adaptation		Mitigation		Institutions		Income		Temperature		Latitude		Longitude	
	More	Less	More	Less	Better	Worse	Higher	Lower	Lower	Higher	North	South	West	East
E3CI	-0.005	-0.114	0.071	0.045	-0.054	-0.071	0.003	-0.063*	-0.034	-0.094	-0.024	-0.121	-0.037	-0.091*
	(0.039)	(0.047)	(0.105)	(0.106)	(0.033)	(0.069)	(0.042)	(0.033)	(0.037)	(0.040)	(0.034)	(0.047)	(0.031)	(0.049)
MaxT	-0.009	-0.110	0.022	0.011	-0.047	-0.069	-0.009	-0.055*	-0.036	-0.073*	-0.029	-0.094	-0.028	-0.097
	(0.038)	(0.044)	(0.119)	(0.124)	(0.030)	(0.057)	(0.037)	(0.030)	(0.033)	(0.038)	(0.031)	(0.044)	(0.028)	(0.046)
MinT †	-0.030	-0.141	-0.133	-0.168	-0.108	0.054	0.036	-0.106	-0.063	-0.134	-0.062	-0.150	-0.060	-0.152
	(0.114)	(0.138)	(0.239)	(0.231)	(0.093)	(0.216)	(0.106)	(0.101)	(0.110)	(0.099)	(0.103)	(0.111)	(0.084)	(0.147)

Drought	-0.134 (0.113)	-0.234 (0.114)	-0.141 (0.152)	-0.246* (0.126)	-0.215 (0.085)	-0.091 (0.185)	-0.088 (0.133)	-0.206 (0.080)	-0.126 (0.111)	-0.298 (0.113)	-0.115 (0.106)	-0.340 (0.136)	-0.204 (0.086)	-0.181 (0.144)
Prec	0.082 (0.112)	-0.079 (0.149)	0.271* (0.152)	0.265 (0.126)	0.008 (0.080)	-0.104 (0.253)	0.016 (0.122)	-0.010 (0.087)	0.005 (0.116)	-0.027 (0.123)	0.022 (0.113)	-0.067 (0.143)	0.003 (0.076)	-0.025 (0.165)
Wind	-0.045 (0.052)	-0.179* (0.092)	-0.017 (0.105)	-0.075 (0.121)	-0.115 (0.050)	-0.081 (0.129)	-0.015 (0.069)	-0.121 (0.056)	-0.057 (0.052)	-0.198 (0.085)	-0.048 (0.043)	-0.232 (0.106)	-0.101 (0.046)	-0.124 (0.093)
Fire	-0.036 (0.074)	-0.154 (0.064)	-0.031 (0.157)	-0.081 (0.148)	-0.104* (0.063)	-0.078 (0.096)	-0.011 (0.075)	-0.111* (0.056)	-0.062 (0.071)	-0.162 (0.060)	-0.046 (0.064)	-0.210 (0.067)	-0.083 (0.061)	-0.128* (0.075)
Hail	0.049 (0.053)	0.204 (0.073)	0.161* (0.095)	0.115 (0.099)	0.130 (0.052)	0.080 (0.112)	0.014 (0.069)	0.132 (0.052)	0.085 (0.059)	0.179* (0.097)	0.074 (0.054)	0.210* (0.108)	0.063 (0.053)	0.201 (0.078)

The table reports estimates from asymmetric dynamic panel regressions. All specifications include Autometrics-selected country fixed effects and macro-financial controls for economic uncertainty, geopolitical risk, financial stress and business cycle conditions. The conditioning variable is relative climate risk (Median/IQR), computed from the E3CI composite index and from each of its components. It is interacted with pairs of dummies partitioning countries according to whether they stand above or below the annual cross-country mean of the Notre Dame Global Adaptation Index (Adaptation), of the CCPI-mm mitigation index (Mitigation), of real per capita GDP (Income) and of average temperature (Temperature), and, in addition, according to EU membership (Institutions) and geographical position (Latitude: North/South; Longitude: West/East). Coefficients are scaled by the pooled standard deviation of the annual within-country change of the underlying series, so that they measure the impact of a typical annual change. The climate measures are per-country GETS. Bold figures denote significance at the 10% level or better; an asterisk marks significance at 10% but not 5%.

Table A8: Robustness of the economic estimates to the construction of the climate measures

	Melly-Pons (fe)	per-country GETS (fs)
Symmetric specifications		
sign agreement, GTS-FE estimator	100/100 (100%)	
sign agreement, FE estimator	107/107 (100%)	
sign agreement, BC-FE estimates (GTS-FE sig. cells)	100/100 (100%)	
cells compared / significant under both	336 / 100	
significance agreement, GTS-FE	271/336 (81%)	
significant under one construction only	16 (fe)	49 (fs)
headline cells (E3CI, two channels)	25/28 (89%)	
Asymmetric specifications		
cells compared / significant under both	4704 / 921	
sign agreement	920/921 (99.9%)	
significance agreement	4025/4704 (86%)	
significant under one construction only	231 (fe)	448 (fs)
Transmission mechanism (components of eight, IQR)		
significant components, real GDP	6	6
significant components, real product wage	7	7
significant components, output per worker	6	8
significant components, investment	0	0
IV diagnostics (symmetric specifications)		
DWH rejections at 10%	143/672 (21%)	194/672 (29%)
DWH rejections at 5%	88/672 (13%)	122/672 (18%)
DWH rejections at 1%	4/672 (1%)	13/672 (2%)
DWH median p-value	0.33	0.21
KP: instrument identified at 5%	557/672 (83%)	469/672 (70%)

Sign agreement is computed on the cells that are significant at the 10% level or better under both constructions; significance agreement is the share of cells on which the two constructions return the same verdict. Symmetric cells are fourteen outcomes by eight components by three conditional moments; asymmetric cells add seven partitions and two sides. Durbin-Wu-Hausman and Kleibergen-Paap figures refer to the Pagan / realized-measure IV of the symmetric specifications. BC-FE standard errors do not embody the Driscoll-Kraay correction for cross-sectional dependence and are downward biased; the BC-FE estimator is therefore compared on point estimates only, over the cells that are doubly significant under GTS-FE. All figures are computed from Tables A4-A/C, A6-A/B/C, A7-A/B/C and A4-B/D; significance is read from the bold marking of the source cells.

Table A9: Exposure of the FF risk factors to climate uncertainty and risk shocks (annual figures; per-country GETS)

Panel A: Climate Uncertainty (IQR)															
Risk Factor	MKT			SMB			HML			RMW			CMA		
	fs	IQR	xPA	fs	IQR	xPA	fs	IQR	xPA	fs	IQR	xPA	fs	IQR	xPA
E3CI	0.045	0.094	-0.080	0.026*	0.024	0.002	-0.034	-0.078	0.072	0.000	0.010	-0.016	-0.019	-0.031	0.019
	(0.034)	(0.069)	(0.073)	(0.014)	(0.029)	(0.034)	(0.028)	(0.054)	(0.062)	(0.013)	(0.030)	(0.033)	(0.022)	(0.035)	(0.044)
	[0.372]	[0.400]	{0.014}	[0.257]	[0.257]	{0.026}	[0.195]	[0.242]	{-0.006}	[0.138]	[0.149]	{-0.006}	[0.162]	[0.169]	{-0.012}
MaxT	-0.021	-0.025	0.012	-0.007	0.010	-0.045	-0.009	-0.020	0.029	0.009	0.015	-0.015	-0.010	-0.022	0.032
	(0.035)	(0.049)	(0.050)	(0.021)	(0.027)	(0.028)	(0.025)	(0.035)	(0.046)	(0.018)	(0.025)	(0.026)	(0.019)	(0.023)	(0.036)
	[0.345]	[0.346]	{-0.013}	[0.206]	[0.265]	{-0.035}	[0.157]	[0.166]	{0.009}	[0.154]	[0.165]	{0.000}	[0.145]	[0.168]	{0.009}
MinT	-0.036	-0.033	-0.010	0.002	0.014	-0.040	0.076	0.097	-0.074	-0.025	-0.034	0.031	0.046*	0.050*	-0.015
	(0.043)	(0.049)	(0.067)	(0.018)	(0.023)	(0.039)	(0.025)	(0.028)	(0.050)	(0.012)	(0.012)	(0.020)	(0.023)	(0.028)	(0.046)
	[0.356]	[0.356]	{-0.043}	[0.201]	[0.233]	{-0.026}	[0.323]	[0.367]	{0.023}	[0.217]	[0.251]	{-0.002}	[0.259]	[0.262]	{0.036}
Drought	0.037	0.056	-0.038	0.020	0.010	0.019	-0.044	-0.076	0.061	0.010	0.023	-0.025	-0.021	-0.026	0.008
	(0.037)	(0.060)	(0.064)	(0.018)	(0.026)	(0.032)	(0.029)	(0.045)	(0.055)	(0.013)	(0.022)	(0.024)	(0.023)	(0.034)	(0.045)
	[0.356]	[0.363]	{0.018}	[0.231]	[0.239]	{0.029}	[0.213]	[0.249]	{-0.015}	[0.151]	[0.178]	{-0.002}	[0.164]	[0.165]	{-0.018}
Prec	0.015	0.015	-0.002	-0.006	-0.003	-0.015	-0.011	-0.021	0.048	-0.010	-0.007	-0.012	-0.014	-0.022	0.039
	(0.029)	(0.034)	(0.065)	(0.015)	(0.018)	(0.043)	(0.028)	(0.032)	(0.049)	(0.014)	(0.019)	(0.027)	(0.021)	(0.025)	(0.039)
	[0.342]	[0.342]	{0.013}	[0.206]	[0.210]	{-0.019}	[0.159]	[0.173]	{0.027}	[0.159]	[0.163]	{-0.020}	[0.155]	[0.174]	{0.017}
Wind	0.029	0.046	-0.049	0.015	0.018	-0.010	-0.022	-0.038	0.046	-0.002	0.005	-0.021	-0.018	-0.027	0.026
	(0.031)	(0.047)	(0.066)	(0.014)	(0.020)	(0.029)	(0.026)	(0.037)	(0.060)	(0.015)	(0.025)	(0.031)	(0.022)	(0.027)	(0.040)
	[0.354]	[0.363]	{-0.003}	[0.222]	[0.224]	{0.008}	[0.174]	[0.190]	{0.008}	[0.139]	[0.153]	{-0.016}	[0.163]	[0.173]	{-0.001}
Fire	0.032	0.054	-0.042	0.018	0.013	0.009	-0.050*	-0.082*	0.064	0.008	0.023	-0.030	-0.026	-0.031	0.009
	(0.038)	(0.061)	(0.068)	(0.017)	(0.024)	(0.032)	(0.028)	(0.043)	(0.055)	(0.013)	(0.020)	(0.024)	(0.023)	(0.034)	(0.045)
	[0.352]	[0.360]	{0.011}	[0.224]	[0.226]	{0.022}	[0.229]	[0.268]	{-0.018}	[0.146]	[0.184]	{-0.007}	[0.177]	[0.178]	{-0.021}
Hail	0.039	0.070	-0.063	0.019	0.019	0.001	-0.037	-0.066	0.060	0.005	0.019	-0.029	-0.023	-0.033	0.020
	(0.035)	(0.062)	(0.069)	(0.015)	(0.023)	(0.032)	(0.027)	(0.044)	(0.059)	(0.013)	(0.022)	(0.027)	(0.023)	(0.032)	(0.042)
	[0.361]	[0.379]	{0.006}	[0.231]	[0.231]	{0.020}	[0.199]	[0.231]	{-0.006}	[0.142]	[0.174]	{-0.010}	[0.172]	[0.179]	{-0.013}
Panel B: Climate Risk (MED)															
Risk Factor	MKT			SMB			HML			RMW			CMA		
	fs	MED	xPA	fs	MED	xPA	fs	MED	xPA	fs	MED	xPA	fs	MED	xPA
E3CI	0.035	0.052	-0.050	0.013	0.014	-0.002	-0.020	-0.034	0.040	-0.008	-0.003	-0.013	-0.016	-0.023	0.021
	(0.031)	(0.053)	(0.076)	(0.012)	(0.019)	(0.028)	(0.029)	(0.039)	(0.060)	(0.015)	(0.025)	(0.034)	(0.023)	(0.028)	(0.043)
	[0.363]	[0.372]	{0.002}	[0.220]	[0.220]	{0.012}	[0.171]	[0.183]	{0.007}	[0.149]	[0.154]	{-0.016}	[0.158]	[0.165]	{-0.002}
MaxT	0.019	0.025	-0.025	0.008	0.014	-0.025	-0.041	-0.059*	0.071	0.010	0.019	-0.038	-0.027	-0.036	0.034
	(0.033)	(0.040)	(0.066)	(0.014)	(0.019)	(0.034)	(0.025)	(0.031)	(0.061)	(0.017)	(0.021)	(0.027)	(0.021)	(0.024)	(0.043)
	[0.344]	[0.346]	{0.001}	[0.207]	[0.218]	{-0.011}	[0.222]	[0.258]	{0.013}	[0.156]	[0.202]	{-0.019}	[0.195]	[0.212]	{-0.002}
MinT †	0.034	0.039	-0.013	0.001	-0.008	0.024	-0.055*	-0.088	0.091	0.012	0.023	-0.033	-0.039*	-0.052*	0.037
	(0.036)	(0.049)	(0.069)	(0.014)	(0.021)	(0.037)	(0.035)	(0.035)	(0.055)	(0.015)	(0.023)	(0.030)	(0.021)	(0.029)	(0.045)
	[0.357]	[0.358]	{0.026}	[0.201]	[0.212]	{0.016}	[0.260]	[0.323]	{0.003}	[0.159]	[0.194]	{-0.009}	[0.239]	[0.259]	{-0.015}
Drought	0.026	0.041	-0.039	0.027	0.028	-0.004	-0.024	-0.034	0.025	0.010	0.020	-0.026	-0.012	-0.011	-0.002
	(0.036)	(0.051)	(0.059)	(0.017)	(0.024)	(0.031)	(0.026)	(0.042)	(0.058)	(0.012)	(0.018)	(0.023)	(0.021)	(0.028)	(0.039)
	[0.349]	[0.356]	{0.002}	[0.264]	[0.265]	{0.024}	[0.175]	[0.182]	{-0.009}	[0.153]	[0.184]	{-0.006}	[0.146]	[0.147]	{-0.013}
Prec	-0.003	-0.006	0.014	-0.022	-0.019	-0.012	0.029	0.031	-0.012	-0.023*	-0.029	0.025	0.010	0.007	0.015
	(0.034)	(0.036)	(0.062)	(0.019)	(0.021)	(0.032)	(0.028)	(0.038)	(0.053)	(0.012)	(0.014)	(0.019)	(0.023)	(0.029)	(0.042)
	[0.337]	[0.338]	{0.008}	[0.240]	[0.243]	{-0.031}	[0.182]	[0.183]	{0.020}	[0.220]	[0.243]	{-0.005}	[0.143]	[0.147]	{0.021}
Wind	0.040	0.058	-0.055	0.018	0.015	0.007	-0.007	-0.011	0.011	-0.011	-0.011	-0.000	-0.008	-0.011	0.010
	(0.032)	(0.053)	(0.070)	(0.014)	(0.019)	(0.025)	(0.029)	(0.039)	(0.053)	(0.014)	(0.022)	(0.029)	(0.023)	(0.028)	(0.038)
	[0.372]	[0.384]	{0.003}	[0.236]	[0.237]	{0.022}	[0.156]	[0.157]	{-0.000}	[0.163]	[0.163]	{-0.011}	[0.142]	[0.144]	{-0.002}
Fire	0.026	0.050	-0.052	0.016	0.022	-0.012	-0.044	-0.063	0.042	0.006	0.022	-0.034	-0.025	-0.026	0.001
	(0.039)	(0.059)	(0.072)	(0.016)	(0.025)	(0.035)	(0.029)	(0.043)	(0.060)	(0.013)	(0.019)	(0.026)	(0.023)	(0.031)	(0.044)
	[0.348]	[0.360]	{-0.002}	[0.222]	[0.225]	{0.010}	[0.216]	[0.232]	{-0.021}	[0.143]	[0.189]	{-0.013}	[0.177]	[0.177]	{-0.025}
Hail	-0.016	-0.021	0.019	-0.025	-0.027	0.008	0.031	0.042	-0.041	-0.017	-0.026	0.032	0.016	0.018	-0.008
	(0.037)	(0.043)	(0.063)	(0.019)	(0.024)	(0.035)	(0.025)	(0.035)	(0.062)	(0.012)	(0.016)	(0.024)	(0.022)	(0.026)	(0.043)
	[0.341]	[0.343]	{-0.002}	[0.256]	[0.257]	{-0.019}	[0.188]	[0.201]	{0.000}	[0.185]	[0.221]	{0.006}	[0.154]	[0.155]	{0.010}
Panel C: Relative Climate Risk (MED/IQR)															
Risk Factor	MKT			SMB			HML			RMW			CMA		
	fs	MED/IQR	xPA	fs	MED/IQR	xPA	fs	MED/IQR	xPA	fs	MED/IQR	xPA	fs	MED/IQR	xPA
E3CI	0.037	0.038	-0.021	0.008	0.009	-0.005	-0.021	-0.024	0.045	-0.007	-0.005	-0.023	-0.015	-0.017	0.030
	(0.039)	(0.044)	(0.092)	(0.013)	(0.014)	(0.046)	(0.029)	(0.031)	(0.087)	(0.017)	(0.019)	(0.037)	(0.022)	(0.023)	(0.069)
	[0.367]	[0.367]	{0.017}	[0.209]	[0.209]	{0.003}	[0.173]	[0.179]	{0.021}	[0.147]	[0.154]	{-0.028}	[0.157]	[0.162]	{0.012}
MaxT	0.021	0.021	0.003	0.008	0.003	0.041	-0.022	-0.026	0.029	0.000	0.002	-0.015	-0.019	-0.020	0.003
	(0.028)	(0.031)	(0.088)	(0.016)	(0.018)	(0.043)	(0.027)	(0.031)	(0.081)	(0.018)	(0.021)	(0.035)	(0.019)	(0.021)	(0.066)
	[0.347]	[0.347]	{0.024}	[0.208]	[0.225]	{0.044}	[0.176]	[0.179]	{0.004}	[0.138]	[0.142]	{-0.013}	[0.170]	[0.170]	{-0.017}
MinT †	0.041	0.047	-0.014	0.006	-0.001	0.015	-0.048	-0.094	0.102	0.011	0.029	-0.039	-0.035	-0.053	0.040
	(0.036)	(0.051)	(0.065)	(0.014)	(0.024)	(0.039)	(0.030)	(0.036)	(0.049)	(0.014)	(0.019)	(0.025)	(0.023)	(0.032)	(0.043)
	[0.364]	[0.365]	{0.033}	[0.204]	[0.209]	{0.014}	[0.233]	[0.322]	{0.008}	[0.155]	[0.213]	{-0.011}	[0.219]	[0.245]	{-0.014}

Drought	0.032	0.042	-0.035	0.027	0.027	-0.001	-0.024	-0.029	0.015	0.009	0.016	-0.024	-0.012	-0.009	-0.010
	(0.036)	(0.046)	(0.058)	(0.018)	(0.022)	(0.033)	(0.026)	(0.038)	(0.056)	(0.013)	(0.017)	(0.025)	(0.021)	(0.025)	(0.039)
	[0.356]	[0.361]	{0.007}	[0.269]	[0.269]	{0.026}	[0.176]	[0.178]	{-0.014}	[0.152]	[0.174]	{-0.008}	[0.147]	[0.148]	{-0.018}
Prec	-0.001	-0.004	0.016	-0.020	-0.018	-0.018	0.030	0.031	-0.009	-0.025	-0.028	0.024	0.008	0.006	0.017
	(0.033)	(0.034)	(0.072)	(0.018)	(0.019)	(0.036)	(0.028)	(0.034)	(0.057)	(0.012)	(0.013)	(0.020)	(0.022)	(0.026)	(0.047)
	[0.337]	[0.338]	{0.012}	[0.236]	[0.241]	{-0.035}	[0.184]	[0.185]	{0.023}	[0.234]	[0.250]	{-0.005}	[0.141]	[0.145]	{0.023}
Wind	0.042	0.050	-0.037	0.015	0.010	0.021	-0.006	-0.008	0.010	-0.010	-0.009	-0.007	-0.009	-0.011	0.010
	(0.034)	(0.047)	(0.071)	(0.014)	(0.016)	(0.028)	(0.028)	(0.034)	(0.056)	(0.014)	(0.020)	(0.030)	(0.022)	(0.024)	(0.042)
	[0.378]	[0.382]	{0.013}	[0.226]	[0.233]	{0.031}	[0.155]	[0.156]	{0.001}	[0.160]	[0.161]	{-0.016}	[0.144]	[0.145]	{-0.001}
Fire	0.056	0.056	-0.014	0.017	0.017	0.086	-0.059	-0.059	-0.036	0.016	0.016	-0.013	-0.028	-0.028	-0.042
	(0.045)	(0.046)	(0.131)	(0.018)	(0.019)	(0.057)	(0.028)	(0.028)	(0.132)	(0.016)	(0.016)	(0.040)	(0.022)	(0.022)	(0.118)
	[0.392]	[0.392]	{0.042}	[0.228]	[0.254]	{0.103*}	[0.282]	[0.284]	{-0.095}	[0.179]	[0.180]	{0.003}	[0.193]	[0.198]	{-0.070}
Hail	-0.021	-0.021	0.001	-0.020	-0.020	-0.002	0.031	0.035	-0.031	-0.017	-0.020	0.027	0.017	0.017	0.003
	(0.036)	(0.039)	(0.073)	(0.018)	(0.020)	(0.043)	(0.026)	(0.031)	(0.071)	(0.013)	(0.015)	(0.028)	(0.021)	(0.022)	(0.051)
	[0.346]	[0.346]	{-0.020}	[0.242]	[0.242]	{-0.022}	[0.193]	[0.199]	{0.004}	[0.190]	[0.207]	{0.006}	[0.160]	[0.160]	{0.020}

The Table reports the estimated betas from the factor-exposure regressions, assessing how climate uncertainty and risk shocks load onto the Fama-French risk factors (MKT, SMB, HML, RMW, CMA). The conditioning variables include the E3CI index and its components (MaxT, MinT, Drought, Prec, Wind, Fire, Hail). Within each factor, the column “fs” presents the bivariate beta of the climate measure over the full sample; the columns “QR, Med, Med/IQR”, and “xPA”present, respectively, the beta of the climate measure and of its interaction with the Paris-agreement indicator (=1 from 2016) in the trivariate specification. Heteroskedasticity-consistent standard errors are in round brackets, and the R-squared of the corresponding regression is in square brackets, reported once under the bivariate column and once under the trivariate one. In the xPA cell, the figure in curly brackets is the post-agreement effect b1 + b2, obtained by accounting for the covariance between the two coefficients. Stock returns are in decimal points. The climate measures enter as standardized annual differences, so each beta is the return response to a one-standard-deviation climate shock. The estimated intercept and the coefficients for the macro-financial control variables (first differences of WUI Europe, GPR, NCISS, the German ex-post real long rate, the broad climate policy uncertainty index, and the recession dummy REC) are omitted. Bold values denote significance at the 10% level or better; those marked with an asterisk are significant at the 10% but not at the 5% level. † For minimum-temperature extremes the climate-relevant movement is a decrease in cold extremes: in the median-based panels (Climate Risk and Relative Climate Risk) the MinT betas are reported with reversed sign.

Table A10-A: Exposure of the FF risk factors to climate uncertainty and risk shocks (quarterly figures; Melly-Pons FE)

Panel A: Climate Uncertainty (IQR)															
Risk Factor	MKT			SMB			HML			RMW			CMA		
	fs	IQR	xPA	fs	IQR	xPA	fs	IQR	xPA	fs	IQR	xPA	fs	IQR	xPA
E3CI	0.002	0.009	-0.016	0.000	-0.001	0.003	-0.004	-0.008	0.010	0.002	0.006*	-0.009	-0.004	-0.005	0.003
	(0.005)	(0.007)	(0.011)	(0.003)	(0.003)	(0.006)	(0.005)	(0.006)	(0.010)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.007)
	[0.215]	[0.222]	{-0.007}	[0.112]	[0.113]	{0.002}	[0.094]	[0.102]	{0.002}	[0.042]	[0.061]	{-0.003}	[0.023]	[0.024]	{-0.003}
MaxT	-0.006	-0.006	-0.001	-0.004	0.000	-0.013	0.005	0.007	-0.004	-0.001	-0.001	0.000	0.003	0.002	0.003
	(0.005)	(0.008)	(0.010)	(0.003)	(0.005)	(0.005)	(0.005)	(0.007)	(0.010)	(0.003)	(0.004)	(0.004)	(0.004)	(0.005)	(0.008)
	[0.219]	[0.219]	{-0.007}	[0.124]	[0.149]	{-0.012}	[0.098]	[0.099]	{0.002}	[0.038]	[0.038]	{-0.001}	[0.019]	[0.020]	{0.005}
MinT	0.002	-0.001	0.010	0.000	-0.000	0.001	0.004	0.004	-0.002	-0.004	-0.007	0.010	0.004	0.004	0.002
	(0.005)	(0.005)	(0.011)	(0.003)	(0.004)	(0.006)	(0.006)	(0.008)	(0.012)	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)	(0.008)
	[0.215]	[0.218]	{0.010}	[0.112]	[0.112]	{0.001}	[0.094]	[0.094]	{0.002}	[0.052]	[0.071]	{0.003}	[0.025]	[0.025]	{0.006}
Drought	0.008	0.011	-0.007	0.003	-0.001	0.011*	-0.009	-0.015	0.015	0.000	0.002	-0.004	-0.007	-0.008	0.003
	(0.006)	(0.009)	(0.012)	(0.003)	(0.005)	(0.006)	(0.006)	(0.007)	(0.011)	(0.003)	(0.004)	(0.005)	(0.004)	(0.006)	(0.009)
	[0.221]	[0.222]	{0.004}	[0.119]	[0.139]	{0.010}	[0.111]	[0.128]	{0.000}	[0.037]	[0.041]	{-0.002}	[0.038]	[0.039]	{-0.005}
Prec	0.001	0.000	0.008	0.000	0.001	-0.002	-0.003	-0.004	0.004	-0.002	-0.003	0.005	-0.001	-0.002	0.006
	(0.004)	(0.004)	(0.015)	(0.003)	(0.003)	(0.009)	(0.005)	(0.006)	(0.013)	(0.003)	(0.003)	(0.008)	(0.004)	(0.004)	(0.009)
	[0.215]	[0.216]	{0.008}	[0.112]	[0.113]	{-0.002}	[0.093]	[0.094]	{0.000}	[0.043]	[0.047]	{0.002}	[0.014]	[0.017]	{0.004}
Wind	0.004	0.013	-0.018	0.003	0.001	0.004	-0.007	-0.016	0.018*	0.002	0.006*	-0.009	-0.006	-0.010*	0.008
	(0.005)	(0.009)	(0.011)	(0.003)	(0.004)	(0.006)	(0.006)	(0.007)	(0.010)	(0.003)	(0.004)	(0.004)	(0.004)	(0.006)	(0.008)
	[0.216]	[0.225]	{-0.005}	[0.119]	[0.122]	{0.005}	[0.105]	[0.129]	{0.010}	[0.039]	[0.061]	{-0.003}	[0.033]	[0.042]	{-0.002}
Fire	0.002	0.006	-0.010	0.001	-0.000	0.003	-0.011*	-0.019	0.018	0.002	0.008	-0.012	-0.008*	-0.010*	0.004
	(0.005)	(0.008)	(0.012)	(0.003)	(0.004)	(0.007)	(0.006)	(0.006)	(0.012)	(0.003)	(0.003)	(0.005)	(0.004)	(0.005)	(0.009)
	[0.215]	[0.217]	{-0.004}	[0.113]	[0.115]	{0.003}	[0.123]	[0.145]	{-0.001}	[0.042]	[0.072]	{-0.004}	[0.053]	[0.056]	{-0.006}
Hail	0.003	0.012	-0.019*	0.002	0.000	0.004	-0.005	-0.011	0.012	0.001	0.006	-0.009	-0.005	-0.008	0.006
	(0.006)	(0.008)	(0.011)	(0.003)	(0.004)	(0.006)	(0.006)	(0.007)	(0.011)	(0.003)	(0.004)	(0.004)	(0.004)	(0.005)	(0.007)
	[0.216]	[0.225]	{-0.007}	[0.115]	[0.117]	{0.004}	[0.097]	[0.108]	{0.002}	[0.039]	[0.059]	{-0.004}	[0.028]	[0.033]	{-0.002}
Panel B: Climate Risk (MED)															
Risk Factor	MKT			SMB			HML			RMW			CMA		
	fs	MED	xPA	fs	MED	xPA	fs	MED	xPA	fs	MED	xPA	fs	MED	xPA
E3CI	0.002	0.009	-0.019*	0.001	0.001	-0.001	-0.003	-0.007	0.010	-0.001	0.002	-0.008	-0.004	-0.005	0.005
	(0.006)	(0.008)	(0.011)	(0.003)	(0.004)	(0.007)	(0.006)	(0.007)	(0.013)	(0.003)	(0.005)	(0.006)	(0.004)	(0.005)	(0.009)
	[0.215]	[0.223]	{-0.010}	[0.113]	[0.113]	{-0.000}	[0.093]	[0.100]	{0.004}	[0.038]	[0.050]	{-0.006}	[0.021]	[0.024]	{-0.000}
MaxT	-0.002	0.001	-0.014	-0.002	-0.000	-0.008	-0.004	-0.008	0.015	0.001	0.003	-0.008	-0.004	-0.006	0.009
	(0.005)	(0.006)	(0.011)	(0.003)	(0.004)	(0.008)	(0.006)	(0.005)	(0.013)	(0.003)	(0.004)	(0.005)	(0.004)	(0.004)	(0.008)
	[0.215]	[0.218]	{-0.012}	[0.116]	[0.124]	{-0.008}	[0.096]	[0.108]	{0.007}	[0.038]	[0.050]	{-0.005}	[0.022]	[0.030]	{0.003}
MinT †	-0.001	0.003	-0.010	-0.002	-0.001	-0.001	-0.003	-0.006	0.008	0.003	0.007	-0.010	-0.005	-0.006	0.003
	(0.005)	(0.006)	(0.011)	(0.002)	(0.004)	(0.006)	(0.006)	(0.008)	(0.012)	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)	(0.008)
	[0.215]	[0.217]	{-0.007}	[0.114]	[0.114]	{-0.002}	[0.093]	[0.097]	{0.001}	[0.048]	[0.070]	{-0.002}	[0.028]	[0.029]	{-0.003}
Drought	0.003	0.009	-0.013	0.004	0.003	0.002	-0.005	-0.010	0.009	0.002	0.006	-0.008*	-0.005	-0.006	0.002
	(0.005)	(0.007)	(0.011)	(0.003)	(0.005)	(0.007)	(0.006)	(0.007)	(0.010)	(0.003)	(0.004)	(0.004)	(0.004)	(0.005)	(0.007)
	[0.215]	[0.220]	{-0.004}	[0.124]	[0.125]	{0.005}	[0.098]	[0.105]	{-0.000}	[0.041]	[0.058]	{-0.003}	[0.026]	[0.027]	{-0.004}
Prec	-0.003	-0.009	0.013	-0.003	-0.001	-0.004	0.005	0.010	-0.011	-0.002	-0.006*	0.009	0.005	0.006	-0.003
	(0.005)	(0.006)	(0.011)	(0.003)	(0.004)	(0.006)	(0.006)	(0.007)	(0.010)	(0.003)	(0.003)	(0.005)	(0.004)	(0.005)	(0.007)
	[0.216]	[0.220]	{0.004}	[0.117]	[0.120]	{-0.005}	[0.098]	[0.107]	{-0.001}	[0.041]	[0.063]	{0.003}	[0.028]	[0.029]	{0.004}
Wind	0.008	0.013	-0.012	0.004	-0.000	0.009	-0.004	-0.005	0.004	-0.003	-0.004	0.003	-0.002	-0.004	0.004
	(0.006)	(0.008)	(0.011)	(0.003)	(0.004)	(0.006)	(0.006)	(0.010)	(0.012)	(0.002)	(0.004)	(0.005)	(0.005)	(0.007)	(0.009)
	[0.222]	[0.225]	{0.001}	[0.121]	[0.134]	{0.009}	[0.094]	[0.096]	{-0.001}	[0.047]	[0.050]	{-0.001}	[0.016]	[0.018]	{0.000}
Fire	0.001	0.007	-0.015	0.002	0.001	0.001	-0.008	-0.013*	0.011	0.002	0.007	-0.011	-0.006	-0.007	0.002
	(0.006)	(0.007)	(0.011)	(0.003)	(0.004)	(0.007)	(0.006)	(0.007)	(0.012)	(0.003)	(0.003)	(0.005)	(0.004)	(0.005)	(0.008)
	[0.215]	[0.220]	{-0.007}	[0.114]	[0.114]	{0.002}	[0.106]	[0.116]	{-0.001}	[0.040]	[0.069]	{-0.005}	[0.037]	[0.037]	{-0.005}
Hail	0.003	-0.001	0.012	-0.000	-0.002	0.004	0.003	0.007	-0.014	-0.004	-0.007	0.011	0.003	0.004	-0.005
	(0.005)	(0.005)	(0.010)	(0.002)	(0.004)	(0.005)	(0.006)	(0.007)	(0.010)	(0.003)	(0.003)	(0.005)	(0.004)	(0.005)	(0.007)
	[0.215]	[0.219]	{0.011}	[0.112]	[0.115]	{0.002}	[0.092]	[0.105]	{-0.006}	[0.050]	[0.074]	{0.003}	[0.018]	[0.021]	{-0.001}
Panel C: Relative Climate Risk (MED/IQR)															
Risk Factor	MKT			SMB			HML			RMW			CMA		
	fs	MED/IQR	xPA	fs	MED/IQR	xPA	fs	MED/IQR	xPA	fs	MED/IQR	xPA	fs	MED/IQR	xPA
E3CI	0.006	0.007	-0.030	-0.001	-0.000	-0.012	-0.003	-0.003	0.006	-0.000	0.000	-0.012	-0.003	-0.003	0.013
	(0.006)	(0.006)	(0.029)	(0.003)	(0.003)	(0.029)	(0.005)	(0.005)	(0.038)	(0.004)	(0.004)	(0.011)	(0.004)	(0.004)	(0.030)
	[0.218]	[0.220]	{-0.023}	[0.113]	[0.115]	{-0.012}	[0.093]	[0.093]	{0.003}	[0.037]	[0.040]	{-0.012}	[0.019]	[0.021]	{0.010}
MaxT	0.001	0.001	-0.005	-0.002	-0.003	0.023*	-0.001	-0.001	0.007	-0.001	-0.001	-0.003	-0.002	-0.002	-0.007
	(0.004)	(0.004)	(0.022)	(0.003)	(0.003)	(0.022)	(0.004)	(0.004)	(0.027)	(0.003)	(0.003)	(0.008)	(0.003)	(0.003)	(0.019)
	[0.215]	[0.215]	{-0.003}	[0.114]	[0.133]	{0.020}	[0.090]	[0.091]	{0.006}	[0.039]	[0.040]	{-0.004}	[0.017]	[0.018]	{-0.009}
MinT †	-0.002	0.004	-0.013	-0.001	-0.001	-0.001	-0.001	-0.006	0.012	0.002	0.008	-0.013	-0.004	-0.006	0.006
	(0.006)	(0.008)	(0.011)	(0.002)	(0.004)	(0.006)	(0.006)	(0.008)	(0.012)	(0.003)	(0.003)	(0.004)	(0.005)	(0.006)	(0.008)
	[0.215]	[0.219]	{-0.009}	[0.114]	[0.114]	{-0.002}	[0.090]	[0.101]	{0.006}	[0.042]	[0.082]	{-0.005}	[0.021]	[0.027]	{0.000}

Drought	0.004	0.010	-0.015	0.004	0.003	0.002	-0.005	-0.008	0.008	0.002	0.005	-0.008*	-0.005	-0.005	0.001
	(0.005)	(0.006)	(0.011)	(0.003)	(0.004)	(0.007)	(0.005)	(0.007)	(0.010)	(0.003)	(0.004)	(0.004)	(0.004)	(0.005)	(0.007)
	[0.216]	[0.221]	{-0.005}	[0.124]	[0.125]	{0.006}	[0.098]	[0.103]	{-0.001}	[0.040]	[0.055]	{-0.003}	[0.025]	[0.026]	{-0.004}
Prec	-0.004	-0.008	0.014	-0.003	-0.002	-0.004	0.008	0.011*	-0.011	-0.003	-0.006	0.010	0.006	0.007	-0.002
	(0.005)	(0.006)	(0.012)	(0.003)	(0.004)	(0.007)	(0.006)	(0.006)	(0.011)	(0.003)	(0.003)	(0.005)	(0.004)	(0.005)	(0.008)
	[0.216]	[0.221]	{0.006}	[0.117]	[0.120]	{-0.006}	[0.106]	[0.114]	{-0.001}	[0.046]	[0.065]	{0.004}	[0.034]	[0.034]	{0.005}
Wind	0.011	0.013*	-0.008	0.002	-0.001	0.010*	-0.004	-0.005	0.004	-0.002	-0.003	0.003	-0.002	-0.004	0.007
	(0.007)	(0.007)	(0.014)	(0.003)	(0.003)	(0.006)	(0.007)	(0.009)	(0.012)	(0.003)	(0.003)	(0.006)	(0.005)	(0.007)	(0.009)
	[0.228]	[0.229]	{0.005}	[0.114]	[0.128]	{0.009*}	[0.096]	[0.097]	{-0.002}	[0.042]	[0.044]	{0.000}	[0.016]	[0.022]	{0.003}
Fire	0.005	0.005	-0.027	0.001	0.001	0.025	-0.012	-0.012	-0.023	0.006	0.006	-0.008	-0.007*	-0.007*	-0.031
	(0.004)	(0.004)	(0.056)	(0.003)	(0.003)	(0.027)	(0.004)	(0.004)	(0.046)	(0.002)	(0.002)	(0.009)	(0.004)	(0.004)	(0.030)
	[0.217]	[0.218]	{-0.022}	[0.114]	[0.118]	{0.026}	[0.134]	[0.136]	{-0.034}	[0.072]	[0.073]	{-0.002}	[0.043]	[0.049]	{-0.038}
Hail	0.002	-0.001	0.012	0.001	-0.000	0.004	0.003	0.006	-0.014	-0.004	-0.006	0.010	0.003	0.004	-0.004
	(0.004)	(0.004)	(0.014)	(0.002)	(0.003)	(0.006)	(0.006)	(0.006)	(0.013)	(0.003)	(0.003)	(0.006)	(0.004)	(0.004)	(0.009)
	[0.215]	[0.217]	{0.012}	[0.113]	[0.114]	{0.004}	[0.093]	[0.102]	{-0.009}	[0.054]	[0.070]	{0.004}	[0.019]	[0.020]	{-0.001}

The Table reports the estimated betas from the factor-exposure regressions, assessing how climate uncertainty and risk shocks load onto the Fama-French risk factors (MKT, SMB, HML, RMW, CMA). The conditioning variables include the E3CI index and its components (MaxT, MinT, Drought, Prec, Wind, Fire, Hail). Within each factor, the column “fs” presents the bivariate beta of the climate measure over the full sample; the columns “QR, Med, Med/IQR”, and “xPA”present, respectively, the beta of the climate measure and of its interaction with the Paris-agreement indicator (=1 from 2016) in the trivariate specification. Heteroskedasticity-consistent standard errors are in round brackets, and the R-squared of the corresponding regression is in square brackets, reported once under the bivariate column and once under the trivariate one. In the xPA cell, the figure in curly brackets is the post-agreement effect b1 + b2, obtained by accounting for the covariance between the two coefficients. Stock returns are in decimal points. The climate measures enter as standardized annual differences, so each beta is the return response to a one-standard-deviation climate shock. The estimated intercept and the coefficients for the macro-financial control variables (first differences of WUI Europe, GPR, NCISS, the German ex-post real long rate, the broad climate policy uncertainty index, and the recession dummy REC) are omitted. Bold values denote significance at the 10% level or better; those marked with an asterisk are significant at the 10% but not at the 5% level. † For minimum-temperature extremes the climate-relevant movement is a decrease in cold extremes: in the median-based panels (Climate Risk and Relative Climate Risk) the MinT betas are reported with reversed sign.

Table A10-B: Exposure of the FF risk factors to climate uncertainty and risk shocks (quarterly figures; per-country GETS)

Panel A: Climate Uncertainty (IQR)															
Risk Factor	MKT			SMB			HML			RMW			CMA		
	fs	IQR	xPA	fs	IQR	xPA	fs	IQR	xPA	fs	IQR	xPA	fs	IQR	xPA
E3CI	0.008	0.027	-0.028	0.005*	0.003	0.003	-0.006	-0.020	0.021*	-0.001	0.002	-0.006	-0.006	-0.013*	0.010
	(0.006)	(0.010)	(0.012)	(0.003)	(0.005)	(0.007)	(0.006)	(0.009)	(0.011)	(0.003)	(0.006)	(0.006)	(0.004)	(0.007)	(0.008)
	[0.221]	[0.239]	{-0.002}	[0.127]	[0.128]	{0.006*}	[0.100]	[0.130]	{0.002}	[0.038]	[0.045]	{-0.003}	[0.031]	[0.046]	{-0.002}
MaxT	-0.007	-0.009	0.003	-0.004	0.000	-0.011*	0.002	0.001	0.002	0.003	0.003	-0.002	0.002	-0.000	0.005
	(0.006)	(0.008)	(0.011)	(0.003)	(0.005)	(0.006)	(0.005)	(0.007)	(0.010)	(0.003)	(0.004)	(0.005)	(0.004)	(0.005)	(0.008)
	[0.220]	[0.220]	{-0.005}	[0.124]	[0.143]	{-0.011}	[0.091]	[0.091]	{0.003}	[0.044]	[0.045]	{0.001}	[0.015]	[0.018]	{0.005}
MinT	-0.006	-0.009	0.007	0.000	0.004	-0.010	0.010	0.018	-0.021	-0.003	-0.006	0.009*	0.009	0.012	-0.007
	(0.005)	(0.007)	(0.011)	(0.003)	(0.004)	(0.007)	(0.006)	(0.005)	(0.013)	(0.003)	(0.003)	(0.005)	(0.004)	(0.004)	(0.009)
	[0.218]	[0.219]	{-0.002}	[0.112]	[0.126]	{-0.006}	[0.118]	[0.148]	{-0.003}	[0.044]	[0.061]	{0.003}	[0.058]	[0.066]	{0.005}
Drought	0.007	0.016*	-0.018	0.004	0.001	0.006	-0.007	-0.018	0.019*	0.000	0.005	-0.008	-0.006	-0.010*	0.007
	(0.005)	(0.009)	(0.012)	(0.003)	(0.005)	(0.006)	(0.006)	(0.008)	(0.010)	(0.003)	(0.004)	(0.005)	(0.004)	(0.006)	(0.008)
	[0.219]	[0.227]	{-0.001}	[0.120]	[0.125]	{0.006}	[0.104]	[0.131]	{0.001}	[0.037]	[0.051]	{-0.003}	[0.035]	[0.043]	{-0.003}
Prec	0.001	0.004	-0.016	-0.002	-0.001	-0.005	0.001	-0.001	0.012	-0.002	-0.002	-0.003	-0.001	-0.003	0.010
	(0.006)	(0.007)	(0.010)	(0.003)	(0.004)	(0.009)	(0.005)	(0.005)	(0.012)	(0.003)	(0.003)	(0.005)	(0.004)	(0.004)	(0.007)
	[0.215]	[0.218]	{-0.012}	[0.116]	[0.118]	{-0.006}	[0.091]	[0.097]	{0.011}	[0.043]	[0.044]	{-0.005}	[0.013]	[0.024]	{0.008}
Wind	0.003	0.011	-0.021	0.001	0.001	0.001	-0.002	-0.006	0.011	-0.001	0.002	-0.006	-0.003	-0.006	0.007
	(0.006)	(0.008)	(0.010)	(0.003)	(0.004)	(0.006)	(0.005)	(0.007)	(0.010)	(0.003)	(0.005)	(0.006)	(0.004)	(0.005)	(0.007)
	[0.215]	[0.226]	{-0.010}	[0.113]	[0.113]	{0.001}	[0.091]	[0.100]	{0.005}	[0.038]	[0.047]	{-0.004}	[0.019]	[0.026]	{0.001}
Fire	0.006	0.016*	-0.019	0.003	0.001	0.004	-0.008	-0.019	0.020*	0.000	0.005	-0.009	-0.007	-0.011*	0.008
	(0.005)	(0.010)	(0.012)	(0.003)	(0.004)	(0.006)	(0.006)	(0.008)	(0.011)	(0.003)	(0.004)	(0.005)	(0.004)	(0.006)	(0.008)
	[0.218]	[0.227]	{-0.003}	[0.118]	[0.121]	{0.005}	[0.108]	[0.137]	{0.001}	[0.037]	[0.055]	{-0.004}	[0.041]	[0.049]	{-0.004}
Hail	0.005	0.019*	-0.024	0.002	0.001	0.003	-0.005	-0.015*	0.018	0.000	0.005	-0.009	-0.006	-0.011*	0.009
	(0.006)	(0.010)	(0.012)	(0.003)	(0.004)	(0.006)	(0.006)	(0.008)	(0.011)	(0.003)	(0.005)	(0.005)	(0.004)	(0.006)	(0.008)
	[0.217]	[0.231]	{-0.005}	[0.116]	[0.118]	{0.004}	[0.098]	[0.120]	{0.002}	[0.037]	[0.055]	{-0.004}	[0.031]	[0.043]	{-0.002}
Panel B: Climate Risk (MED)															
Risk Factor	MKT			SMB			HML			RMW			CMA		
	fs	MED	xPA	fs	MED	xPA	fs	MED	xPA	fs	MED	xPA	fs	MED	xPA
E3CI	0.005	0.013	-0.021*	0.002	0.001	0.002	-0.002	-0.006	0.010	-0.002	-0.000	-0.005	-0.003	-0.005	0.006
	(0.006)	(0.009)	(0.011)	(0.003)	(0.004)	(0.006)	(0.006)	(0.007)	(0.012)	(0.003)	(0.005)	(0.006)	(0.005)	(0.005)	(0.009)
	[0.217]	[0.227]	{-0.008}	[0.114]	[0.115]	{0.003}	[0.091]	[0.097]	{0.004}	[0.041]	[0.047]	{-0.005}	[0.019]	[0.023]	{0.001}
MaxT	0.000	0.006	-0.016	-0.001	-0.000	-0.002	-0.004	-0.010*	0.017	0.002	0.005	-0.009*	-0.004	-0.007	0.009
	(0.005)	(0.007)	(0.010)	(0.003)	(0.004)	(0.006)	(0.006)	(0.006)	(0.011)	(0.003)	(0.004)	(0.005)	(0.004)	(0.004)	(0.007)
	[0.215]	[0.220]	{-0.010}	[0.113]	[0.113]	{-0.002}	[0.096]	[0.115]	{0.007}	[0.040]	[0.058]	{-0.005}	[0.025]	[0.035]	{0.001}
MinT †	0.005	0.011	-0.014	-0.001	-0.004	0.007	-0.007	-0.016	0.020	0.001	0.005	-0.008	-0.007	-0.012	0.010
	(0.006)	(0.008)	(0.010)	(0.003)	(0.004)	(0.007)	(0.006)	(0.006)	(0.012)	(0.003)	(0.004)	(0.005)	(0.005)	(0.005)	(0.008)
	[0.217]	[0.222]	{-0.003}	[0.113]	[0.119]	{0.003}	[0.103]	[0.131]	{0.004}	[0.039]	[0.053]	{-0.003}	[0.044]	[0.058]	{-0.002}
Drought	0.003	0.011	-0.017	0.003	0.003	0.002	-0.004	-0.010	0.012	0.001	0.006	-0.009	-0.004	-0.006	0.004
	(0.005)	(0.007)	(0.011)	(0.003)	(0.004)	(0.006)	(0.006)	(0.007)	(0.010)	(0.003)	(0.004)	(0.005)	(0.004)	(0.005)	(0.007)
	[0.215]	[0.222]	{-0.006}	[0.120]	[0.121]	{0.004}	[0.096]	[0.106]	{0.002}	[0.039]	[0.060]	{-0.003}	[0.023]	[0.025]	{-0.002}
Prec	0.000	-0.002	0.008	-0.003	-0.001	-0.004	0.006	0.009	-0.009	-0.004	-0.007	0.009	0.004	0.004	0.001
	(0.005)	(0.005)	(0.012)	(0.003)	(0.004)	(0.007)	(0.005)	(0.006)	(0.010)	(0.003)	(0.003)	(0.004)	(0.003)	(0.005)	(0.007)
	[0.215]	[0.216]	{0.005}	[0.117]	[0.119]	{-0.005}	[0.100]	[0.105]	{-0.000}	[0.051]	[0.069]	{0.002}	[0.024]	[0.024]	{0.005}
Wind	0.006	0.015*	-0.022	0.003	0.001	0.003	-0.000	-0.002	0.005	-0.003	-0.001	-0.003	-0.001	-0.003	0.005
	(0.007)	(0.008)	(0.011)	(0.003)	(0.004)	(0.006)	(0.005)	(0.007)	(0.011)	(0.003)	(0.004)	(0.005)	(0.004)	(0.006)	(0.008)
	[0.219]	[0.230]	{-0.008}	[0.117]	[0.119]	{0.005}	[0.090]	[0.092]	{0.003}	[0.044]	[0.046]	{-0.005}	[0.015]	[0.018]	{0.001}
Fire	0.004	0.014	-0.019	0.002	0.001	0.002	-0.008	-0.016	0.016	0.000	0.006	-0.010*	-0.007	-0.010*	0.006
	(0.005)	(0.009)	(0.012)	(0.003)	(0.004)	(0.007)	(0.007)	(0.007)	(0.012)	(0.003)	(0.004)	(0.005)	(0.004)	(0.005)	(0.008)
	[0.216]	[0.225]	{-0.004}	[0.116]	[0.116]	{0.003}	[0.106]	[0.124]	{-0.000}	[0.037]	[0.060]	{-0.004}	[0.040]	[0.044]	{-0.004}
Hail	-0.000	-0.005	0.013	-0.002	-0.002	-0.000	0.004	0.010	-0.014	-0.003	-0.007	0.010	0.004	0.006	-0.005
	(0.005)	(0.006)	(0.010)	(0.003)	(0.004)	(0.006)	(0.006)	(0.007)	(0.010)	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)	(0.007)
	[0.215]	[0.219]	{0.008}	[0.115]	[0.115]	{-0.002}	[0.095]	[0.109]	{-0.004}	[0.046]	[0.070]	{0.003}	[0.021]	[0.025]	{0.001}
Panel C: Relative Climate Risk (MED/IQR)															
Risk Factor	MKT			SMB			HML			RMW			CMA		
	fs	MED/IQR	xPA	fs	MED/IQR	xPA	fs	MED/IQR	xPA	fs	MED/IQR	xPA	fs	MED/IQR	xPA
E3CI	0.007	0.009	-0.027*	-0.000	-0.000	-0.000	-0.003	-0.004	0.014	-0.001	-0.001	-0.007	-0.003	-0.004	0.010
	(0.007)	(0.007)	(0.015)	(0.003)	(0.003)	(0.011)	(0.005)	(0.006)	(0.018)	(0.003)	(0.004)	(0.006)	(0.004)	(0.004)	(0.014)
	[0.220]	[0.226]	{-0.018}	[0.112]	[0.112]	{-0.000}	[0.093]	[0.097]	{0.010}	[0.039]	[0.043]	{-0.008}	[0.019]	[0.024]	{0.006}
MaxT	0.003	0.005	-0.013	-0.001	-0.002	0.010	-0.003	-0.005	0.011	0.000	0.001	-0.007	-0.004	-0.005	0.003
	(0.004)	(0.005)	(0.013)	(0.003)	(0.004)	(0.009)	(0.005)	(0.006)	(0.016)	(0.003)	(0.004)	(0.007)	(0.004)	(0.004)	(0.011)
	[0.215]	[0.218]	{-0.008}	[0.113]	[0.121]	{0.008}	[0.093]	[0.098]	{0.007}	[0.037]	[0.043]	{-0.006}	[0.024]	[0.024]	{-0.002}
MinT †	0.005	0.014	-0.015	-0.000	-0.002	0.005	-0.005	-0.019	0.025	0.001	0.006	-0.010*	-0.006	-0.014	0.013
	(0.005)	(0.009)	(0.011)	(0.003)	(0.004)	(0.007)	(0.007)	(0.007)	(0.010)	(0.003)	(0.004)	(0.005)	(0.005)	(0.006)	(0.008)
	[0.217]	[0.223]	{-0.001}	[0.112]	[0.117]	{0.003}	[0.097]	[0.143]	{0.007}	[0.037]	[0.060]	{-0.004}	[0.036]	[0.062]	{0.000}

Drought	0.005	0.010	-0.015	0.004	0.003	0.003	-0.005	-0.008	0.010	0.001	0.005	-0.009*	-0.004	-0.005	0.002
	(0.005)	(0.007)	(0.011)	(0.003)	(0.004)	(0.007)	(0.005)	(0.007)	(0.010)	(0.003)	(0.004)	(0.005)	(0.004)	(0.005)	(0.007)
	[0.217]	[0.223]	{-0.005}	[0.121]	[0.123]	{0.006}	[0.096]	[0.104]	{0.002}	[0.039]	[0.058]	{-0.004}	[0.024]	[0.025]	{-0.003}
Prec	0.000	-0.002	0.009	-0.002	-0.001	-0.004	0.006	0.008	-0.009	-0.004*	-0.007	0.009	0.004	0.004	0.001
	(0.004)	(0.005)	(0.012)	(0.003)	(0.004)	(0.007)	(0.005)	(0.006)	(0.011)	(0.003)	(0.003)	(0.004)	(0.003)	(0.004)	(0.008)
	[0.215]	[0.216]	{0.007}	[0.116]	[0.118]	{-0.005}	[0.101]	[0.105]	{-0.001}	[0.055]	[0.071]	{0.002}	[0.023]	[0.023]	{0.005}
Wind	0.008	0.012	-0.020*	0.002	0.000	0.006	-0.000	-0.002	0.006	-0.002	-0.001	-0.005	-0.002	-0.003	0.006
	(0.006)	(0.008)	(0.011)	(0.003)	(0.003)	(0.007)	(0.005)	(0.006)	(0.010)	(0.003)	(0.004)	(0.006)	(0.004)	(0.005)	(0.009)
	[0.221]	[0.228]	{-0.008}	[0.115]	[0.119]	{0.007}	[0.090]	[0.092]	{0.005}	[0.042]	[0.047]	{-0.006*}	[0.015]	[0.019]	{0.003}
Fire	0.012*	0.013*	-0.020	0.002	0.001	0.017	-0.013	-0.014	0.002	0.003	0.003	-0.008	-0.009	-0.009*	-0.010
	(0.007)	(0.007)	(0.025)	(0.003)	(0.004)	(0.013)	(0.005)	(0.005)	(0.033)	(0.003)	(0.003)	(0.008)	(0.004)	(0.004)	(0.023)
	[0.228]	[0.230]	{-0.007}	[0.114]	[0.123]	{0.019}	[0.140]	[0.140]	{-0.012}	[0.045]	[0.047]	{-0.005}	[0.058]	[0.060]	{-0.018}
Hail	-0.001	-0.004	0.012	-0.001	-0.001	-0.002	0.005	0.008	-0.015	-0.004	-0.006	0.010*	0.004	0.005	-0.004
	(0.004)	(0.005)	(0.012)	(0.003)	(0.003)	(0.007)	(0.006)	(0.006)	(0.011)	(0.003)	(0.003)	(0.005)	(0.004)	(0.004)	(0.008)
	[0.215]	[0.217]	{0.008}	[0.113]	[0.114]	{-0.003}	[0.096]	[0.108]	{-0.007}	[0.049]	[0.067]	{0.005}	[0.023]	[0.024]	{0.001}

The Table reports the estimated betas from the factor-exposure regressions, assessing how climate uncertainty and risk shocks load onto the Fama-French risk factors (MKT, SMB, HML, RMW, CMA). The conditioning variables include the E3CI index and its components (MaxT, MinT, Drought, Prec, Wind, Fire, Hail). Within each factor, the column “fs” presents the bivariate beta of the climate measure over the full sample; the columns “QR, Med, Med/IQR”, and “xPA”present, respectively, the beta of the climate measure and of its interaction with the Paris-agreement indicator (=1 from 2016) in the trivariate specification. Heteroskedasticity-consistent standard errors are in round brackets, and the R-squared of the corresponding regression is in square brackets, reported once under the bivariate column and once under the trivariate one. In the xPA cell, the figure in curly brackets is the post-agreement effect b1 + b2, obtained by accounting for the covariance between the two coefficients. Stock returns are in decimal points. The climate measures enter as standardized annual differences, so each beta is the return response to a one-standard-deviation climate shock. The estimated intercept and the coefficients for the macro-financial control variables (first differences of WUI Europe, GPR, NCISS, the German ex-post real long rate, the broad climate policy uncertainty index, and the recession dummy REC) are omitted. Bold values denote significance at the 10% level or better; those marked with an asterisk are significant at the 10% but not at the 5% level. † For minimum-temperature extremes the climate-relevant movement is a decrease in cold extremes: in the median-based panels (Climate Risk and Relative Climate Risk) the MinT betas are reported with reversed sign.

Table A11-A: Exposure of the FF risk factors to climate uncertainty and risk shocks (monthly figures; Melly-Pons FE)

Panel A: Climate Uncertainty (IQR)															
Risk Factor	MKT			SMB			HML			RMW			CMA		
	fs	IQR	xPA	fs	IQR	xPA	fs	IQR	xPA	fs	IQR	xPA	fs	IQR	xPA
E3CI	-0.001	0.001	-0.004	-0.000	-0.001	0.001	-0.001	-0.003*	0.005	0.001	0.002	-0.003	-0.001	-0.002	0.001
	(0.002)	(0.003)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
	[0.159]	[0.161]	{-0.004}	[0.053]	[0.054]	{0.000}	[0.081]	[0.089]	{0.001}	[0.048]	[0.059]	{-0.001*}	[0.012]	[0.013]	{-0.001}
MaxT	-0.001	-0.000	-0.001	-0.001	0.000	-0.004	0.002	0.002	-0.002	-0.000	-0.000	0.000	0.001	0.001	0.001
	(0.002)	(0.003)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
	[0.159]	[0.159]	{-0.001}	[0.056]	[0.065]	{-0.004}	[0.083]	[0.084]	{0.000}	[0.047]	[0.047]	{-0.000}	[0.010]	[0.011]	{0.001}
MinT	0.002	0.001	0.003	0.000	0.000	0.000	0.001	0.002	-0.002	-0.001	-0.002	0.004	0.001	0.001	0.000
	(0.002)	(0.002)	(0.003)	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)
	[0.161]	[0.161]	{0.004}	[0.053]	[0.053]	{0.000}	[0.082]	[0.084]	{-0.000}	[0.052]	[0.063]	{0.001}	[0.015]	[0.015]	{0.002}
Drought	0.000	0.001	-0.002	0.001	-0.001	0.004*	-0.003	-0.005	0.006	-0.000	0.001	-0.002	-0.002	-0.002	0.001
	(0.002)	(0.003)	(0.004)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)
	[0.159]	[0.159]	{-0.001}	[0.054]	[0.062]	{0.003}	[0.089]	[0.100]	{0.001}	[0.047]	[0.049]	{-0.001}	[0.018]	[0.018]	{-0.001}
Prec	0.001	0.001	0.001	0.000	0.000	-0.001	-0.001	-0.001	-0.000	-0.001	-0.001	0.002	-0.000	-0.001	0.002
	(0.002)	(0.002)	(0.005)	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.003)
	[0.159]	[0.159]	{0.002}	[0.053]	[0.054]	{-0.001}	[0.080]	[0.080]	{-0.001}	[0.049]	[0.051]	{0.001}	[0.009]	[0.010]	{0.001}
Wind	-0.001	0.002	-0.005	0.001	-0.000	0.002	-0.003	-0.006	0.007*	0.000	0.002	-0.004	-0.002	-0.003*	0.003
	(0.002)	(0.004)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)
	[0.159]	[0.161]	{-0.003}	[0.055]	[0.056]	{0.002}	[0.088]	[0.105]	{0.001}	[0.048]	[0.059]	{-0.001*}	[0.018]	[0.022]	{-0.001}
Fire	-0.002	-0.001	-0.002	0.000	-0.001	0.001	-0.003	-0.007	0.007*	0.001	0.003	-0.004	-0.002	-0.003*	0.001
	(0.002)	(0.003)	(0.005)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)
	[0.160]	[0.160]	{-0.003}	[0.053]	[0.054]	{0.001}	[0.095]	[0.112]	{0.000}	[0.048]	[0.063]	{-0.002*}	[0.025]	[0.027]	{-0.002}
Hail	-0.001	0.002	-0.005	0.001	-0.000	0.001	-0.002	-0.004*	0.005	0.000	0.002*	-0.004	-0.002	-0.003	0.002
	(0.002)	(0.004)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)
	[0.159]	[0.162]	{-0.003}	[0.054]	[0.055]	{0.001}	[0.084]	[0.093]	{0.001}	[0.047]	[0.059]	{-0.001}	[0.016]	[0.019]	{-0.001}
Panel B: Climate Risk (MED)															
Risk Factor	MKT			SMB			HML			RMW			CMA		
	fs	MED	xPA	fs	MED	xPA	fs	MED	xPA	fs	MED	xPA	fs	MED	xPA
E3CI	-0.000	0.002	-0.007	0.000	0.000	-0.000	-0.001	-0.003	0.004	-0.000	0.001	-0.003	-0.001	-0.002	0.001
	(0.003)	(0.003)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
	[0.159]	[0.163]	{-0.005}	[0.053]	[0.053]	{-0.000}	[0.081]	[0.086]	{0.001}	[0.047]	[0.054]	{-0.002}	[0.013]	[0.015]	{-0.000}
MaxT	-0.001	0.000	-0.006	-0.001	-0.000	-0.002	-0.002	-0.003	0.005	0.000	0.001	-0.003*	-0.001	-0.002	0.002
	(0.002)	(0.003)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.003)
	[0.159]	[0.162]	{-0.006*}	[0.055]	[0.057]	{-0.002}	[0.082]	[0.088]	{0.002}	[0.047]	[0.054]	{-0.002}	[0.014]	[0.017]	{0.000}
MinT †	-0.002	-0.001	-0.003	-0.001	-0.001	0.000	-0.001	-0.003	0.004	0.001	0.003	-0.004	-0.002	-0.002	0.001
	(0.002)	(0.003)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)	(0.004)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)
	[0.160]	[0.161]	{-0.004}	[0.054]	[0.054]	{-0.001}	[0.082]	[0.087]	{0.001}	[0.050]	[0.063]	{-0.001}	[0.016]	[0.017]	{-0.001}
Drought	-0.001	0.000	-0.003	0.001	0.001	0.001	-0.002	-0.004*	0.005	0.001	0.002*	-0.003	-0.001	-0.002	0.001
	(0.002)	(0.003)	(0.004)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
	[0.159]	[0.160]	{-0.003}	[0.056]	[0.057]	{0.002}	[0.084]	[0.091]	{0.000}	[0.048]	[0.057]	{-0.001*}	[0.014]	[0.015]	{-0.001}
Prec	0.001	-0.000	0.003	-0.001	0.000	-0.002	0.002	0.004*	-0.005	-0.001	-0.002	0.004	0.001	0.002	-0.001
	(0.002)	(0.003)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)
	[0.159]	[0.160]	{0.003}	[0.054]	[0.056]	{-0.001}	[0.084]	[0.093]	{-0.001}	[0.048]	[0.059]	{0.001}	[0.015]	[0.016]	{0.001}
Wind	0.003	0.005	-0.005	0.001	-0.000	0.003	-0.001	-0.002	0.001	-0.001	-0.001	0.001	-0.001	-0.001	0.001
	(0.002)	(0.003)	(0.003)	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)	(0.004)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)
	[0.162]	[0.164]	{-0.000}	[0.057]	[0.062]	{0.003}	[0.081]	[0.081]	{-0.001}	[0.050]	[0.051]	{-0.000}	[0.010]	[0.011]	{-0.000}
Fire	-0.002	0.000	-0.004	0.000	0.000	0.000	-0.003	-0.005	0.005	0.000	0.002	-0.004	-0.002	-0.002	0.001
	(0.002)	(0.003)	(0.004)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)
	[0.160]	[0.161]	{-0.004}	[0.054]	[0.054]	{0.001}	[0.088]	[0.097]	{0.000}	[0.048]	[0.063]	{-0.002}	[0.019]	[0.020]	{-0.001}
Hail	0.002	0.001	0.004	-0.000	-0.000	0.001	0.001	0.003	-0.006	-0.001	-0.002	0.004	0.001	0.001	-0.002
	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)
	[0.161]	[0.162]	{0.005}	[0.053]	[0.054]	{0.001}	[0.081]	[0.091]	{-0.002}	[0.051]	[0.064]	{0.001}	[0.011]	[0.013]	{-0.000}
Panel C: Relative Climate Risk (MED/IQR)															
Risk Factor	MKT			SMB			HML			RMW			CMA		
	fs	MED/IQR	xPA	fs	MED/IQR	xPA	fs	MED/IQR	xPA	fs	MED/IQR	xPA	fs	MED/IQR	xPA
E3CI	0.001	0.002	-0.011	-0.000	-0.000	-0.002	-0.001	-0.002	0.001	0.000	0.000	-0.005	-0.001	-0.001	0.002
	(0.002)	(0.003)	(0.011)	(0.001)	(0.001)	(0.008)	(0.002)	(0.002)	(0.011)	(0.001)	(0.001)	(0.003)	(0.001)	(0.001)	(0.011)
	[0.159]	[0.160]	{-0.009}	[0.053]	[0.054]	{-0.002}	[0.082]	[0.082]	{-0.001}	[0.047]	[0.049]	{-0.005*}	[0.012]	[0.012]	{0.001}
MaxT	-0.000	-0.000	-0.007	-0.001	-0.001	0.007	-0.000	-0.001	0.004	-0.000	-0.000	-0.002	-0.001	-0.001	-0.002
	(0.002)	(0.002)	(0.008)	(0.001)	(0.001)	(0.005)	(0.001)	(0.001)	(0.009)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.007)
	[0.159]	[0.160]	{-0.007}	[0.054]	[0.060]	{0.006}	[0.079]	[0.080]	{0.003}	[0.048]	[0.049]	{-0.002}	[0.010]	[0.011]	{-0.003}
MinT †	-0.002	0.001	-0.005	-0.001	0.000	0.000	-0.001	-0.003	0.005	0.001	0.003	-0.005	-0.001	-0.002	0.002
	(0.002)	(0.004)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)	(0.004)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)
	[0.160]	[0.163]	{-0.005}	[0.054]	[0.054]	{-0.001}	[0.079]	[0.087]	{0.002}	[0.049]	[0.068]	{-0.002}	[0.012]	[0.016]	{0.000}

Drought	-0.001	0.001	-0.004	0.001	0.001	0.001	-0.002	-0.004	0.004	0.000	0.002	-0.003	-0.001	-0.002	0.000
	(0.002)	(0.003)	(0.004)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
	[0.159]	[0.160]	{-0.003}	[0.056]	[0.057]	{0.002}	[0.085]	[0.090]	{0.000}	[0.048]	[0.056]	{-0.001*}	[0.014]	[0.014]	{-0.001}
Prec	0.001	-0.001	0.004	-0.001	-0.000	-0.002	0.003	0.004	-0.005	-0.001	-0.002	0.004	0.002	0.002	-0.001
	(0.002)	(0.003)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)
	[0.159]	[0.160]	{0.004}	[0.054]	[0.056]	{-0.002}	[0.089]	[0.097]	{-0.001}	[0.050]	[0.060]	{0.002*}	[0.018]	[0.018]	{0.001}
Wind	0.004	0.004	-0.002	0.000	-0.000	0.003*	-0.002	-0.002	0.000	-0.001	-0.001	0.001	-0.001	-0.001	0.002
	(0.002)	(0.003)	(0.005)	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)
	[0.164]	[0.165]	{0.002}	[0.054]	[0.059]	{0.003}	[0.082]	[0.082]	{-0.001}	[0.048]	[0.049]	{0.000}	[0.010]	[0.012]	{0.001}
Fire	0.000	0.000	-0.009	0.000	0.000	0.009	-0.004	-0.004	-0.000	0.002	0.002	-0.006	-0.002*	-0.002*	-0.009
	(0.002)	(0.002)	(0.019)	(0.001)	(0.001)	(0.009)	(0.001)	(0.001)	(0.017)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.012)
	[0.158]	[0.159]	{-0.009}	[0.054]	[0.056]	{0.009}	[0.106]	[0.106]	{-0.005}	[0.060]	[0.062]	{-0.004*}	[0.023]	[0.026]	{-0.011}
Hail	0.002	0.001	0.005	0.000	0.000	0.001	0.001	0.003	-0.006	-0.001	-0.002	0.004*	0.001	0.001	-0.001
	(0.002)	(0.002)	(0.005)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.003)
	[0.160]	[0.161]	{0.006}	[0.054]	[0.054]	{0.001}	[0.082]	[0.089]	{-0.003}	[0.053]	[0.062]	{0.002}	[0.011]	[0.012]	{-0.000}

The Table reports the estimated betas from the factor-exposure regressions, assessing how climate uncertainty and risk shocks load onto the Fama-French risk factors (MKT, SMB, HML, RMW, CMA). The conditioning variables include the E3CI index and its components (MaxT, MinT, Drought, Prec, Wind, Fire, Hail). Within each factor, the column “fs” presents the bivariate beta of the climate measure over the full sample; the columns “QR, Med, Med/IQR”, and “xPA”present, respectively, the beta of the climate measure and of its interaction with the Paris-agreement indicator (=1 from 2016) in the trivariate specification. Heteroskedasticity-consistent standard errors are in round brackets, and the R-squared of the corresponding regression is in square brackets, reported once under the bivariate column and once under the trivariate one. In the xPA cell, the figure in curly brackets is the post-agreement effect b1 + b2, obtained by accounting for the covariance between the two coefficients. Stock returns are in decimal points. The climate measures enter as standardized annual differences, so each beta is the return response to a one-standard-deviation climate shock. The estimated intercept and the coefficients for the macro-financial control variables (first differences of WUI Europe, GPR, NCISS, the German ex-post real long rate, the broad climate policy uncertainty index, and the recession dummy REC) are omitted. Bold values denote significance at the 10% level or better; those marked with an asterisk are significant at the 10% but not at the 5% level. † For minimum-temperature extremes the climate-relevant movement is a decrease in cold extremes: in the median-based panels (Climate Risk and Relative Climate Risk) the MinT betas are reported with reversed sign.

Table A11-B: Exposure of the FF risk factors to climate uncertainty and risk shocks (monthly figures; per-country GETS)

Panel A: Climate Uncertainty (IQR)															
Risk Factor	MKT			SMB			HML			RMW			CMA		
	fs	IQR	xPA	fs	IQR	xPA	fs	IQR	xPA	fs	IQR	xPA	fs	IQR	xPA
E3CI	0.000	0.005	-0.007	0.001	0.000	0.001	-0.002	-0.007	0.008	-0.000	0.001	-0.002	-0.002	-0.004*	0.003
	(0.002)	(0.005)	(0.005)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)	(0.004)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.003)
	[0.159]	[0.163]	{-0.002}	[0.057]	[0.058]	{0.002}	[0.085]	[0.105]	{0.001}	[0.048]	[0.052]	{-0.001}	[0.016]	[0.023]	{-0.000}
MaxT	-0.002	-0.002	0.000	-0.001	0.000	-0.004	0.001	0.000	0.001	0.001	0.001	-0.001	0.000	-0.000	0.001
	(0.002)	(0.003)	(0.004)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)	(0.003)
	[0.159]	[0.159]	{-0.001}	[0.056]	[0.064]	{-0.004}	[0.079]	[0.079]	{0.001}	[0.050]	[0.050]	{0.000}	[0.009]	[0.010]	{0.001}
MinT	0.001	-0.000	0.002	0.000	0.002	-0.003	0.003	0.007	-0.008*	-0.001	-0.002	0.003	0.003	0.004	-0.003
	(0.002)	(0.003)	(0.004)	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)
	[0.159]	[0.159]	{0.002}	[0.054]	[0.059]	{-0.002}	[0.093]	[0.114]	{-0.002}	[0.049]	[0.058]	{0.001}	[0.028]	[0.032]	{0.001}
Drought	-0.001	0.002	-0.004	0.001	-0.000	0.002	-0.002	-0.006	0.007	0.000	0.002	-0.003*	-0.002	-0.003	0.002
	(0.002)	(0.004)	(0.005)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)	(0.003)
	[0.159]	[0.160]	{-0.002}	[0.055]	[0.057]	{0.002}	[0.087]	[0.105]	{0.001}	[0.047]	[0.054]	{-0.001}	[0.017]	[0.021]	{-0.001}
Prec	0.000	0.002	-0.007*	-0.001	-0.000	-0.001	0.000	-0.000	0.003	-0.001	-0.000	-0.001	-0.000	-0.001	0.003
	(0.002)	(0.003)	(0.004)	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)
	[0.159]	[0.162]	{-0.006*}	[0.055]	[0.055]	{-0.002}	[0.079]	[0.081]	{0.001}	[0.049]	[0.050]	{-0.002}	[0.009]	[0.012]	{0.002}
Wind	-0.000	0.003	-0.007*	0.000	0.000	0.000	-0.001	-0.003	0.004	-0.000	0.001	-0.003	-0.001	-0.002	0.002
	(0.003)	(0.004)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.003)
	[0.159]	[0.164]	{-0.004*}	[0.054]	[0.054]	{0.000}	[0.080]	[0.086]	{0.001}	[0.047]	[0.053]	{-0.002}	[0.012]	[0.016]	{0.000}
Fire	-0.001	0.002	-0.004	0.001	-0.000	0.002	-0.003	-0.007	0.008	-0.000	0.002	-0.003	-0.002	-0.003*	0.002
	(0.002)	(0.004)	(0.005)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)
	[0.159]	[0.161]	{-0.003}	[0.054]	[0.056]	{0.001}	[0.088]	[0.108]	{0.001}	[0.047]	[0.056]	{-0.001*}	[0.020]	[0.024]	{-0.001}
Hail	-0.001	0.003	-0.006	0.001	-0.000	0.001	-0.002	-0.006	0.007*	-0.000	0.002	-0.003	-0.002	-0.003*	0.003
	(0.002)	(0.004)	(0.005)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)
	[0.159]	[0.162]	{-0.003}	[0.054]	[0.055]	{0.001}	[0.084]	[0.101]	{0.001}	[0.047]	[0.057]	{-0.001*}	[0.017]	[0.023]	{-0.000}
Panel B: Climate Risk (MED)															
Risk Factor	MKT			SMB			HML			RMW			CMA		
	fs	MED	xPA	fs	MED	xPA	fs	MED	xPA	fs	MED	xPA	fs	MED	xPA
E3CI	0.001	0.004	-0.007	0.000	0.000	0.001	-0.001	-0.002	0.003	-0.001	0.000	-0.002	-0.001	-0.002	0.002
	(0.003)	(0.004)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
	[0.159]	[0.164]	{-0.004}	[0.054]	[0.054]	{0.001}	[0.080]	[0.084]	{0.001}	[0.049]	[0.052]	{-0.002}	[0.012]	[0.014]	{-0.000}
MaxT	-0.001	0.001	-0.006	-0.000	-0.000	-0.000	-0.002	-0.004*	0.006	0.000	0.002	-0.004	-0.002	-0.002	0.003
	(0.002)	(0.003)	(0.004)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.003)
	[0.159]	[0.162]	{-0.005*}	[0.054]	[0.054]	{-0.001}	[0.083]	[0.095]	{0.002}	[0.048]	[0.058]	{-0.002}	[0.015]	[0.020]	{0.000}
MinT †	-0.001	0.002	-0.004	0.000	-0.002	0.002	-0.002	-0.006	0.008*	-0.000	0.002	-0.003*	-0.002	-0.004	0.003
	(0.002)	(0.003)	(0.004)	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)
	[0.159]	[0.160]	{-0.003}	[0.054]	[0.057]	{0.001}	[0.087]	[0.106]	{0.002}	[0.047]	[0.056]	{-0.001*}	[0.023]	[0.031]	{0.000}
Drought	-0.001	0.001	-0.004	0.001	0.001	0.001	-0.002	-0.004*	0.005	0.000	0.002*	-0.004	-0.001	-0.002	0.001
	(0.002)	(0.003)	(0.004)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
	[0.159]	[0.161]	{-0.003}	[0.055]	[0.056]	{0.001}	[0.083]	[0.092]	{0.001}	[0.048]	[0.059]	{-0.001*}	[0.013]	[0.014]	{-0.001}
Prec	0.002	0.001	0.002	-0.001	-0.000	-0.001	0.002	0.004*	-0.005	-0.001	-0.002	0.003	0.001	0.001	-0.000
	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)
	[0.160]	[0.160]	{0.003}	[0.054]	[0.055]	{-0.001}	[0.085]	[0.091]	{-0.001}	[0.051]	[0.061]	{0.001}	[0.013]	[0.013]	{0.001}
Wind	0.001	0.004	-0.008*	0.001	0.000	0.001	-0.000	-0.001	0.002	-0.001	-0.000	-0.001	-0.001	-0.001	0.001
	(0.003)	(0.003)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)	(0.003)
	[0.159]	[0.165]	{-0.003}	[0.055]	[0.056]	{0.002}	[0.079]	[0.080]	{0.001}	[0.049]	[0.051]	{-0.002}	[0.010]	[0.011]	{0.000}
Fire	-0.001	0.001	-0.004	0.000	-0.000	0.001	-0.003	-0.006	0.007*	0.000	0.002*	-0.004	-0.002	-0.003*	0.002
	(0.002)	(0.004)	(0.005)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)
	[0.159]	[0.161]	{-0.003}	[0.054]	[0.054]	{0.001}	[0.088]	[0.103]	{0.001}	[0.047]	[0.059]	{-0.002*}	[0.021]	[0.023]	{-0.001}
Hail	0.002	0.000	0.004	-0.000	-0.000	-0.000	0.002	0.004*	-0.006	-0.001	-0.002	0.004	0.001	0.002	-0.002
	(0.002)	(0.003)	(0.004)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)
	[0.160]	[0.161]	{0.004}	[0.054]	[0.054]	{-0.001}	[0.082]	[0.094]	{-0.002}	[0.050]	[0.063]	{0.001*}	[0.012]	[0.014]	{0.000}
Panel C: Relative Climate Risk (MED/IQR)															
Risk Factor	MKT			SMB			HML			RMW			CMA		
	fs	MED/IQR	xPA	fs	MED/IQR	xPA	fs	MED/IQR	xPA	fs	MED/IQR	xPA	fs	MED/IQR	xPA
E3CI	0.001	0.002	-0.009	-0.000	-0.000	0.001	-0.001	-0.002	0.005	-0.000	0.000	-0.003	-0.001	-0.001	0.002
	(0.003)	(0.003)	(0.006)	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)	(0.006)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.005)
	[0.159]	[0.162]	{-0.007}	[0.053]	[0.053]	{0.001}	[0.082]	[0.084]	{0.003}	[0.047]	[0.050]	{-0.003}	[0.012]	[0.013]	{0.001}
MaxT	-0.001	0.000	-0.006	-0.000	-0.001	0.003	-0.001	-0.002	0.005	0.000	0.001	-0.003	-0.001	-0.002	0.001
	(0.002)	(0.002)	(0.005)	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)	(0.005)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.004)
	[0.159]	[0.160]	{-0.005}	[0.054]	[0.056]	{0.002}	[0.082]	[0.086]	{0.002}	[0.047]	[0.051]	{-0.002*}	[0.014]	[0.015]	{-0.001}
MinT †	-0.001	0.002	-0.005	0.000	-0.001	0.002	-0.002	-0.007	0.009	-0.000	0.002	-0.004	-0.002	-0.004	0.005
	(0.002)	(0.004)	(0.004)	(0.001)	(0.002)	(0.003)	(0.003)	(0.002)	(0.003)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)
	[0.159]	[0.162]	{-0.003}	[0.053]	[0.055]	{-0.000}	[0.084]	[0.112]	{0.002}	[0.047]	[0.058]	{-0.001}	[0.018]	[0.033]	{-0.000}

Drought	-0.000	0.001	-0.004	0.001	0.001	0.001	-0.002	-0.004	0.005	0.000	0.002	-0.003	-0.001	-0.002	0.001
	(0.002)	(0.003)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
	[0.159]	[0.160]	{-0.003}	[0.055]	[0.056]	{0.002}	[0.084]	[0.091]	{0.001}	[0.048]	[0.058]	{-0.002}	[0.014]	[0.014]	{-0.001}
Prec	0.002	0.001	0.002	-0.001	-0.000	-0.001	0.002	0.003*	-0.005	-0.001	-0.002	0.004	0.001	0.001	0.000
	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)
	[0.160]	[0.161]	{0.004}	[0.054]	[0.055]	{-0.002}	[0.085]	[0.091]	{-0.001}	[0.052]	[0.062]	{0.001*}	[0.013]	[0.013]	{0.001}
Wind	0.002	0.004	-0.008*	0.001	0.000	0.002	-0.000	-0.001	0.002	-0.001	-0.000	-0.002	-0.001	-0.001	0.002
	(0.003)	(0.003)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)	(0.003)
	[0.160]	[0.164]	{-0.004}	[0.054]	[0.056]	{0.002}	[0.079]	[0.080]	{0.001}	[0.048]	[0.051]	{-0.002}	[0.010]	[0.011]	{0.001}
Fire	0.002	0.002	-0.006	0.000	0.000	0.006	-0.005	-0.005	0.005	0.001	0.001	-0.004	-0.003	-0.003*	-0.002
	(0.002)	(0.003)	(0.009)	(0.001)	(0.001)	(0.004)	(0.002)	(0.002)	(0.011)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.008)
	[0.159]	[0.160]	{-0.004}	[0.054]	[0.058]	{0.007}	[0.109]	[0.110]	{-0.000}	[0.050]	[0.053]	{-0.003}	[0.030]	[0.030]	{-0.005}
Hail	0.001	0.000	0.005	-0.000	-0.000	-0.001	0.002	0.003	-0.006	-0.001	-0.002	0.004	0.001	0.002	-0.001
	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.003)
	[0.159]	[0.161]	{0.005}	[0.054]	[0.054]	{-0.001}	[0.084]	[0.093]	{-0.003}	[0.051]	[0.061]	{0.002}	[0.013]	[0.014]	{0.000}

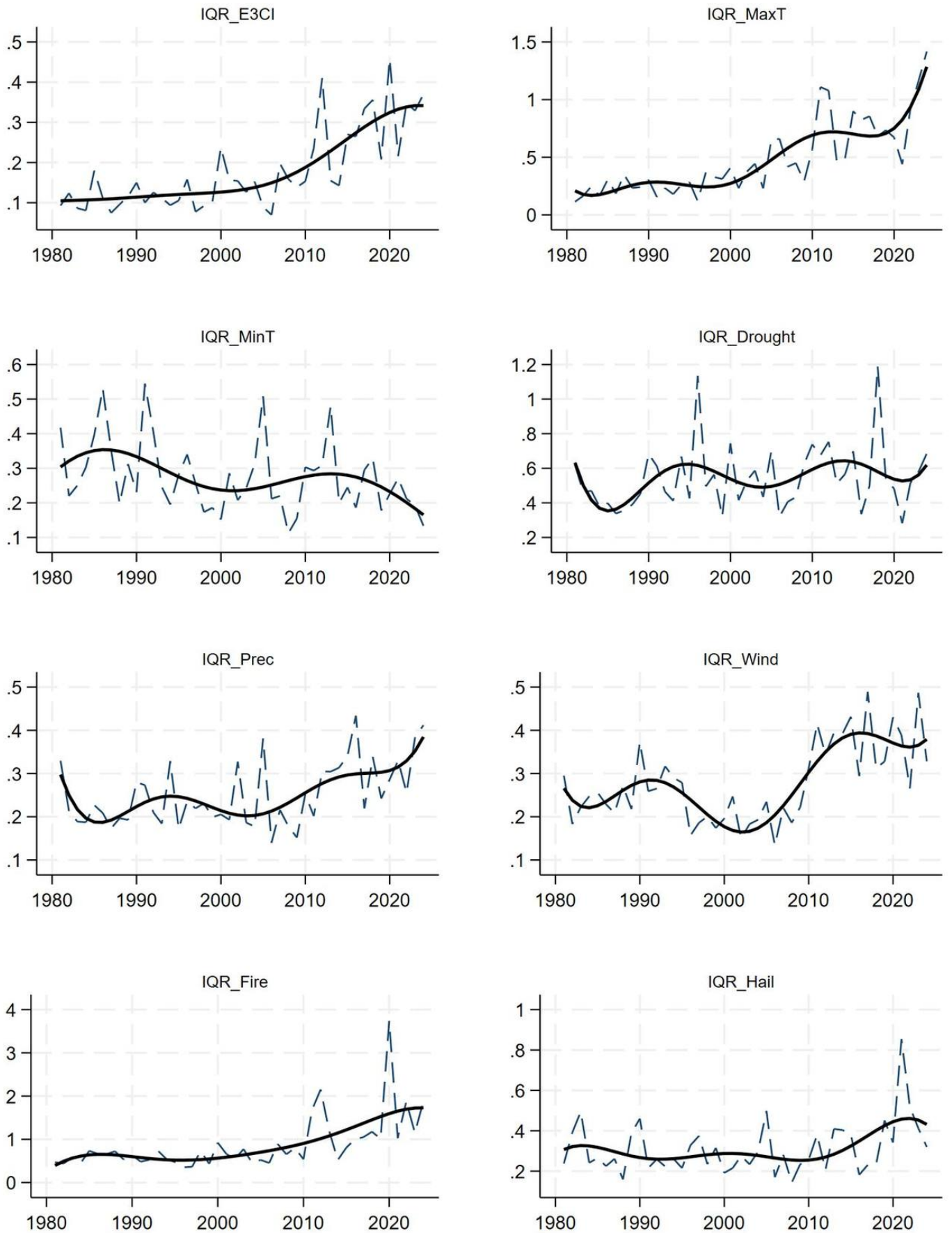
The Table reports the estimated betas from the factor-exposure regressions, assessing how climate uncertainty and risk shocks load onto the Fama-French risk factors (MKT, SMB, HML, RMW, CMA). The conditioning variables include the E3CI index and its components (MaxT, MinT, Drought, Prec, Wind, Fire, Hail). Within each factor, the column “fs” presents the bivariate beta of the climate measure over the full sample; the columns “QR, Med, Med/IQR”, and “xPA”present, respectively, the beta of the climate measure and of its interaction with the Paris-agreement indicator (=1 from 2016) in the trivariate specification. Heteroskedasticity-consistent standard errors are in round brackets, and the R-squared of the corresponding regression is in square brackets, reported once under the bivariate column and once under the trivariate one. In the xPA cell, the figure in curly brackets is the post-agreement effect b1 + b2, obtained by accounting for the covariance between the two coefficients. Stock returns are in decimal points. The climate measures enter as standardized annual differences, so each beta is the return response to a one-standard-deviation climate shock. The estimated intercept and the coefficients for the macro-financial control variables (first differences of WUI Europe, GPR, NCISS, the German ex-post real long rate, the broad climate policy uncertainty index, and the recession dummy REC) are omitted. Bold values denote significance at the 10% level or better; those marked with an asterisk are significant at the 10% but not at the 5% level. † For minimum-temperature extremes the climate-relevant movement is a decrease in cold extremes: in the median-based panels (Climate Risk and Relative Climate Risk) the MinT betas are reported with reversed sign.

Table A12: Robustness of the climate-factor exposures to the construction of the climate measures and the sampling frequency

	Melly-Pons (fe)	per-country GETS (fs)
Estimator coherence (annual specifications)		
sign agreement, full-sample column, all cells	111/120 (92%)	
by factor: MKT / SMB / HML / RMW / CMA	96% / 88% / 96% / 83% / 100%	
significance agreement, full-sample column	108/120 (90%)	
significant under one construction only	4 (fe)	8 (fs)
sign agreement, cells significant under both (all columns and frequencies)	80/80 (100%)	
Value spread: wildfire exposure (pre-agreement coefficients)		
uncertainty, annual / quarterly / monthly	-0.087 / -0.019 / -0.007	-0.082 / -0.019 / -0.007
relative risk, annual / quarterly / monthly	-0.053 / -0.012 / -0.004	-0.059 / -0.014 / -0.005
MaxT absolute risk, annual	-0.055	-0.059
significant post-agreement sums, HML (all frequencies)	0	0
Minimum-temperature component (annual)		
sign agreement, bivariate and pre-agreement columns	26/30 (87%)	
among cells significant under the per-country construction	11/11 (100%)	
Frequency coherence (sign identical at all three frequencies)		
pre-agreement (trivariate) column	95/120 (79%)	102/120 (85%)
full-sample (bivariate) column	83/120 (69%)	80/120 (67%)
annually significant loadings recurring at both intra-year frequencies	7/8 (88%)	11/11 (100%)
Post-agreement sums significant (annual)		
SMB	5	2
MKT / HML / RMW / CMA	0 / 0 / 0 / 0	0 / 0 / 0 / 0

Sign agreement is computed on the betas of Tables 8 and A9-A11; significance is read from the bold marking of the source cells (10% level or better). The full-sample column refers to the bivariate specification, the pre-agreement column to the climate beta of the trivariate specification, and post-agreement sums to the b1+b2 figures in curly brackets. Cells significant under both refers to significance under both the Melly-Pons and the per-country GETS construction. Doubly significant sign agreement pools the full-sample, pre-agreement, interaction and post-agreement columns at all three frequencies. The intra-year regressions hold the annual climate values constant within the year, so cross-frequency coherence is a check of specification stability rather than independent evidence. The single value-spread interaction significant under the per-country construction is reported in Table A9.

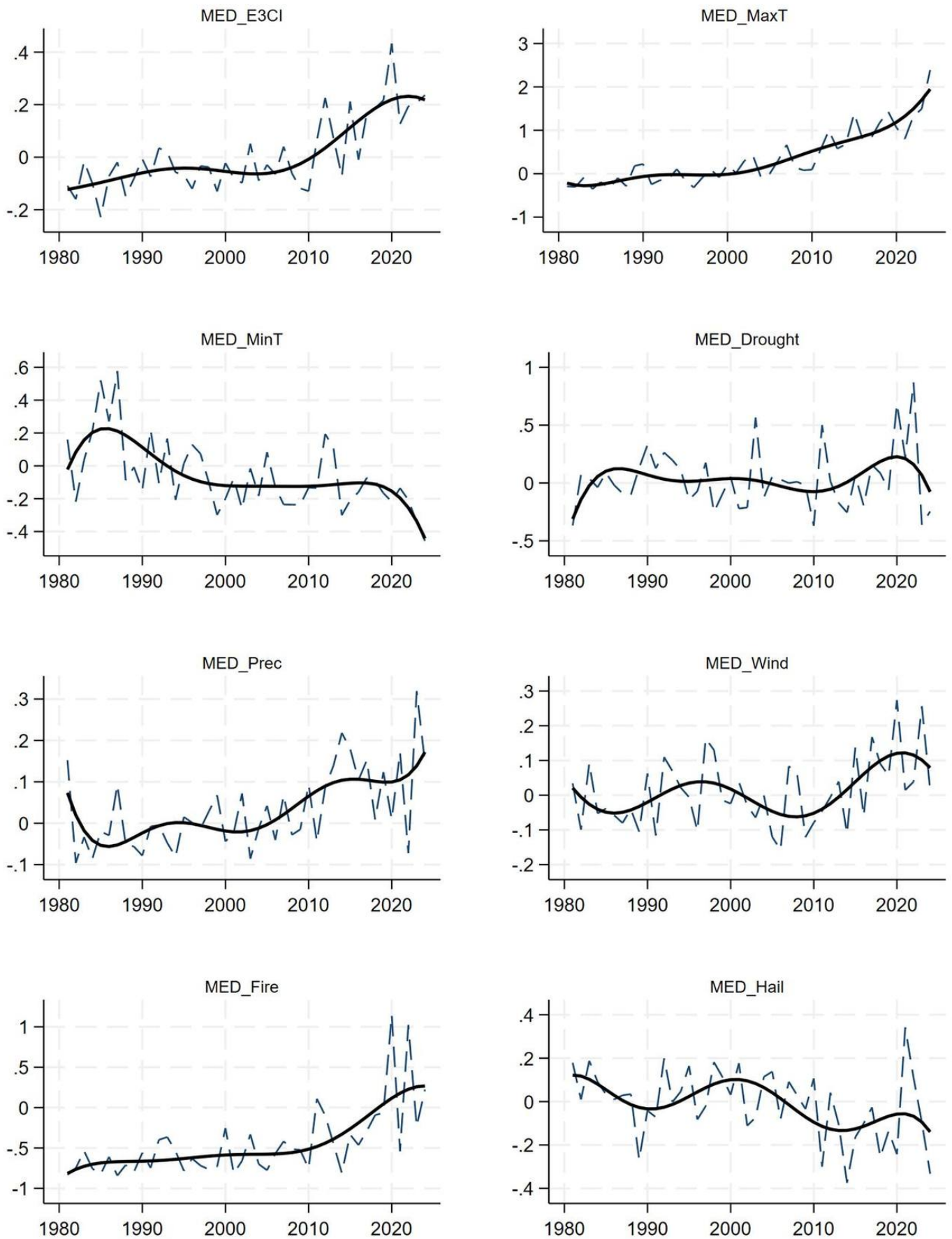
Extreme weather indicators (IQR)



Dashed = indicator; solid = nonlinear (Fourier) trend

Figure A1. The plots show the cross-sectional IQR over time for the E3CI index and its components: extreme maximum and minimum temperatures (MaxT, MinT), extreme wind (Wind), extreme precipitation (Prec), droughts (Drought), wildfires (Fire), and hail (Hail). A third-order Fourier polynomial trend line is also included (solid line).

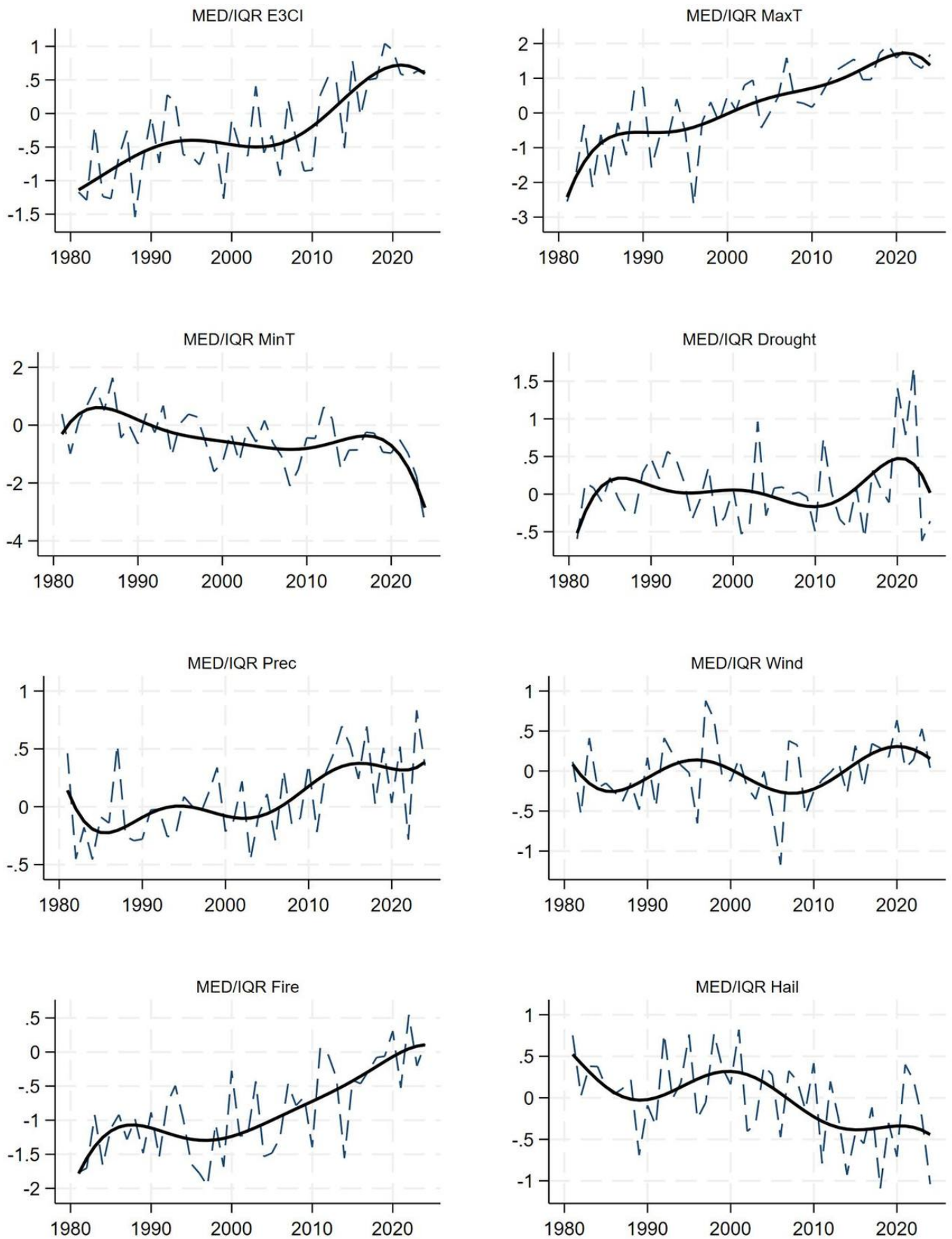
Extreme weather indicators (medians)



Dashed = indicator; solid = nonlinear (Fourier) trend

Figure A2. The plots show the cross-sectional median over time for the E3CI index and its components: extreme maximum and minimum temperatures (MaxT, MinT), extreme wind (Wind), extreme precipitation (Prec), droughts (Drought), wildfires (Fire), and hail (Hail). A third-order Fourier polynomial trend line is also included (solid line).

Median/IQR ratios - climate indicators



Dashed = ratio; solid = nonlinear (Fourier) trend

Figure A3. The plots show the cross-sectional Median/IQR ratio over time for the E3CI index and its components, namely extreme maximum and minimum temperatures (MaxT, MinT), extreme wind (Wind), extreme precipitation (Prec), droughts (Drought), wildfires (Fire), and hail (Hail) components. A third-order Fourier polynomial trend line is also included (solid line).

Quantile coefficient process - per-country GETS (common-spec)

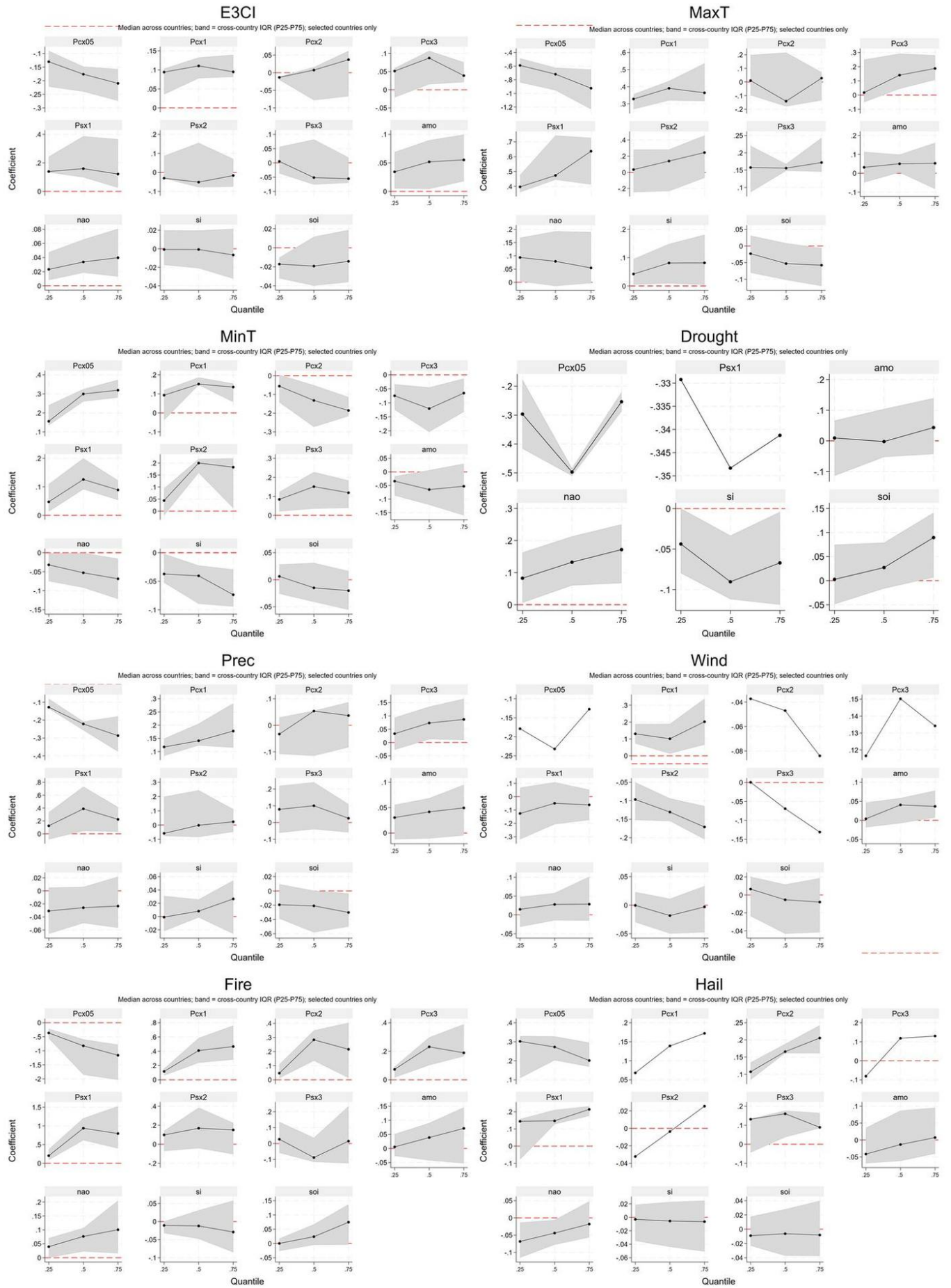


Figure A4 shows the median-country distribution of the per-country quantile-regression coefficients on the conditioning variables, estimated under the common-specification GETS model. Each panel corresponds to one extreme-weather indicator (E3CI and its seven components: MaxT, MinT, Drought, Prec, Wind, Fire, Hail). Each sub-plot in each panel traces the coefficient process of one conditioning variable across the three estimated quantile levels shown on the horizontal axis (the first quartile $\tau = 0.25$, the median $\tau = 0.50$, and the third quartile $\tau = 0.75$). The black dots give the cross-country median of those estimates and the gray shading spans their cross-country interquartile range (the 25th–75th percentiles of the estimates across countries). The conditioning set comprises the trigonometric (Fourier) terms in the anthropogenic-forcing index AGGI; Pcx_k and Psx_k denote the cosine and sine components of order k, respectively; together with the AMO, NAO, SOI (ENSO), and SI (solar-irradiance) oscillators. The red dashed line marks zero.

IQR contribution by variable - per-country GETS (restricted model)

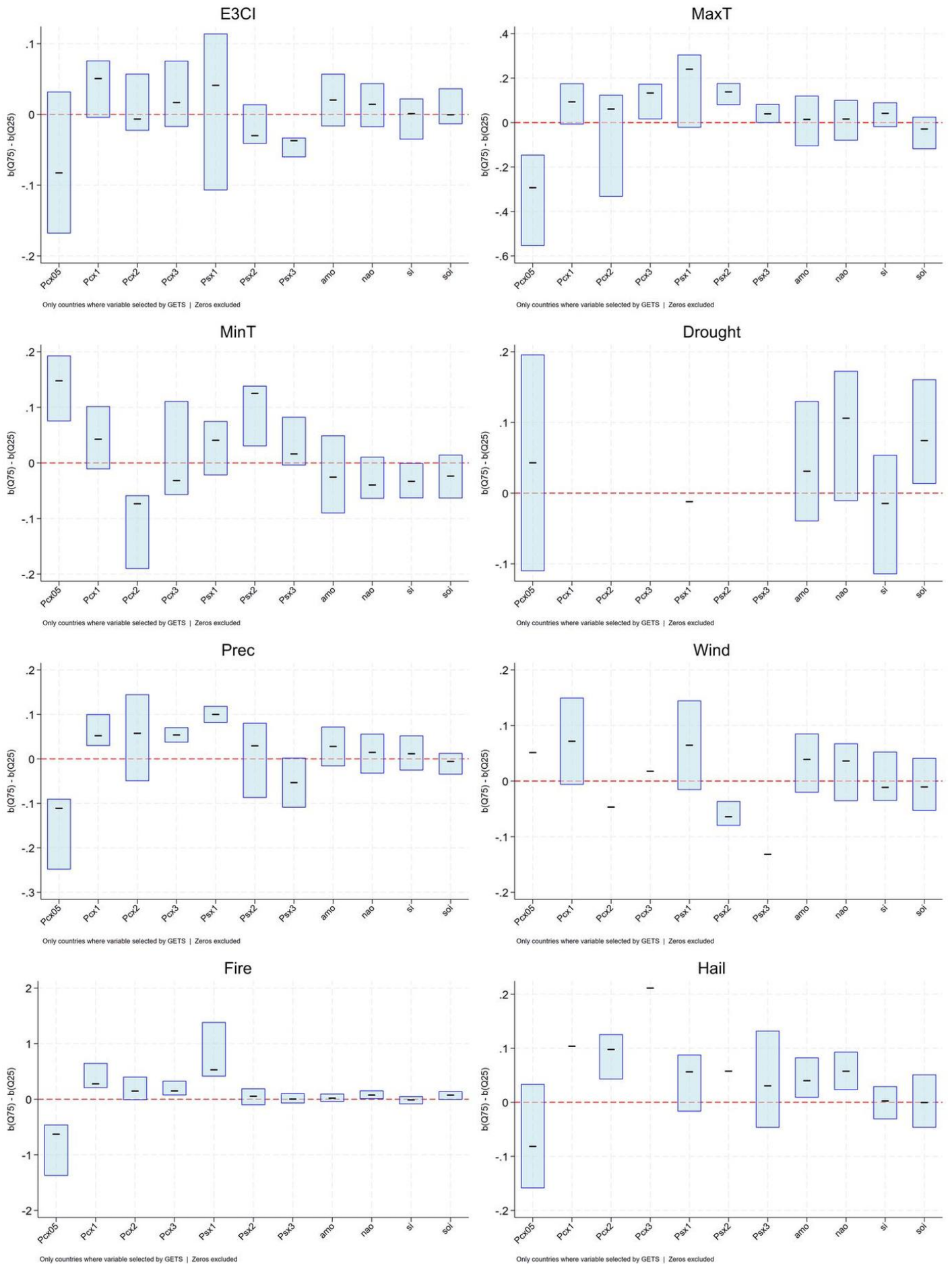
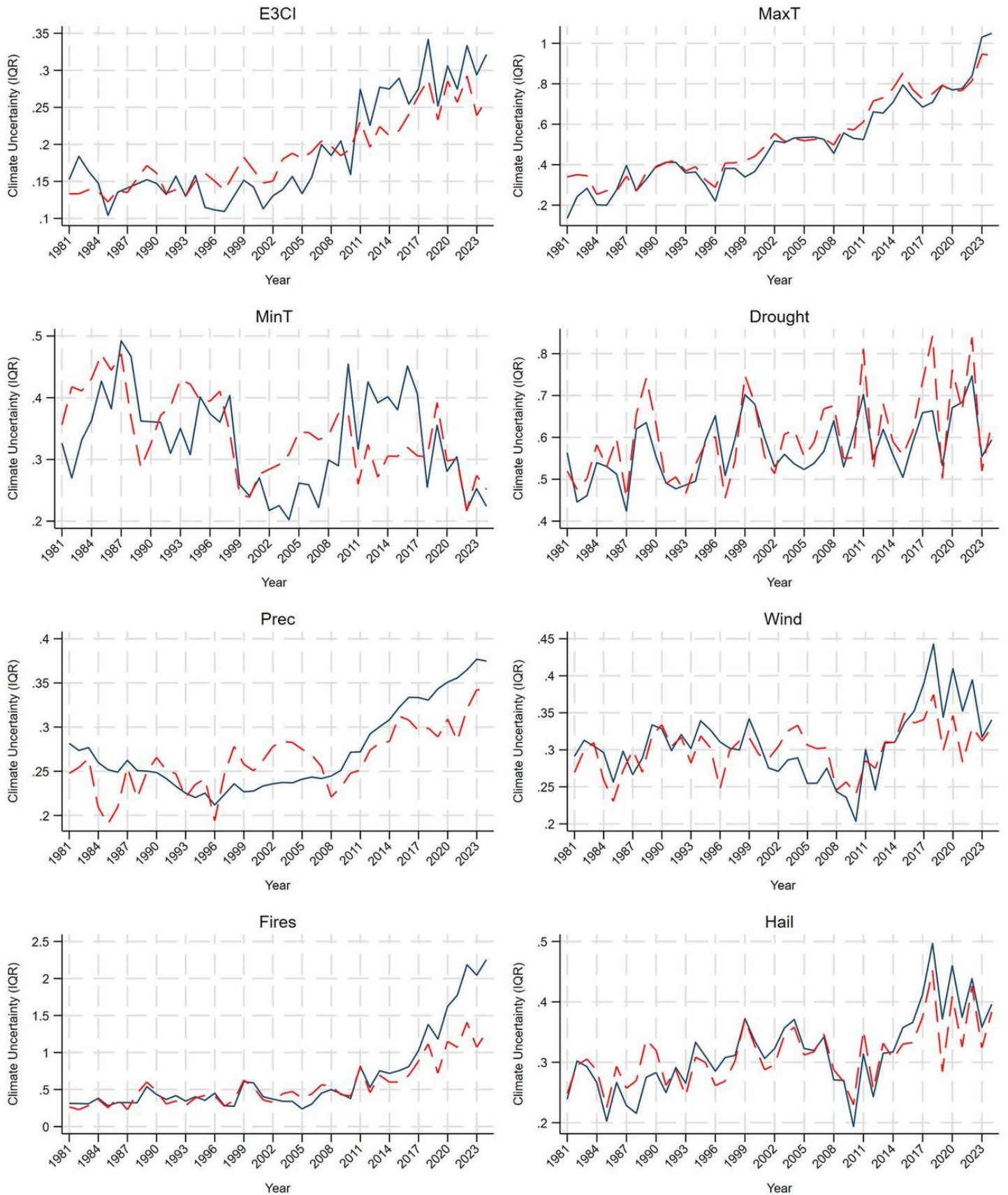


Figure A5 shows the cross-country distribution of each conditioning variable's contribution to the interquartile range (IQR), per-country GETS (common-specification, restricted) model. Each panel corresponds to one extreme-weather indicator (E3CI and its seven components: MaxT, MinT, Drought, Prec, Wind, Fire, Hail). Within a panel, every box summarizes the variable's contribution to the conditional spread, measured as the difference between its upper- and lower-quartile coefficients, $b(Q75) - b(Q25)$. The black dashed line is the cross-country median of this contribution and the shaded box spans its cross-country interquartile range (the 25th–75th percentiles of the country-level estimates). The horizontal axis lists the conditioning variables: Pcx_k and Psx_k are the cosine and sine components of order *k* of the Fourier expansion in the anthropogenic-forcing index AGGI, followed by the AMO, NAO, SOI (ENSO) and SI (solar-irradiance) oscillations.

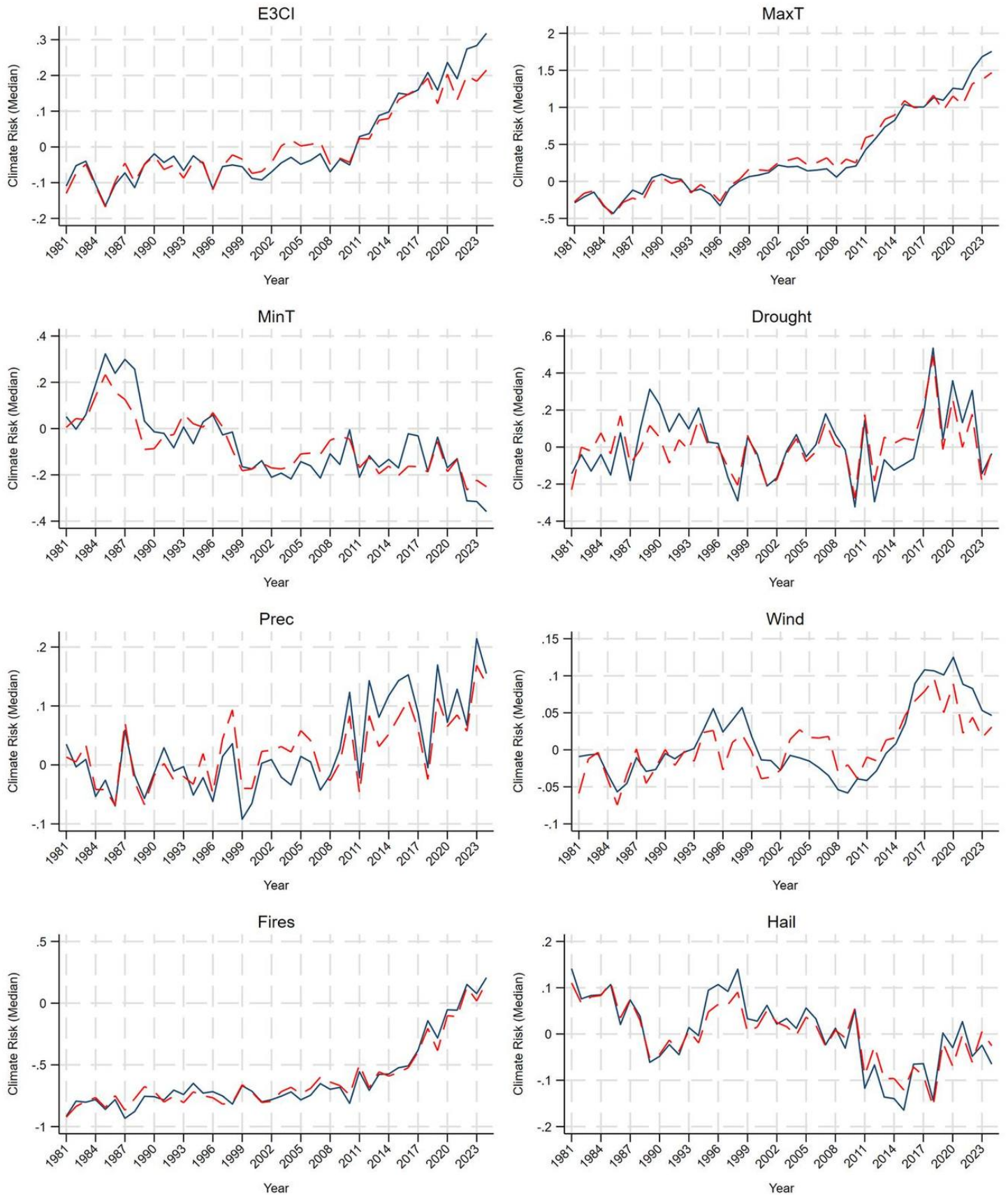
Climate Uncertainty in Europe 1981-2024 - FE vs GETS



Navy solid: FE (pooled Melly-Pons). Red dash: GETS (per-country).

Figure A6. Aggregate conditional interquartile functions (climate uncertainty) for the E3CI index and its components - extreme maximum and minimum temperatures (MaxT, MinT), extreme wind (Wind), extreme precipitation (Prec), droughts (Drought), wildfires (Fire) and hail (Hail) - obtained from the pooled Melly-Pons fixed-effects first stage (navy solid) and as the cross-country average of the per-country GETS estimates (red dashed).

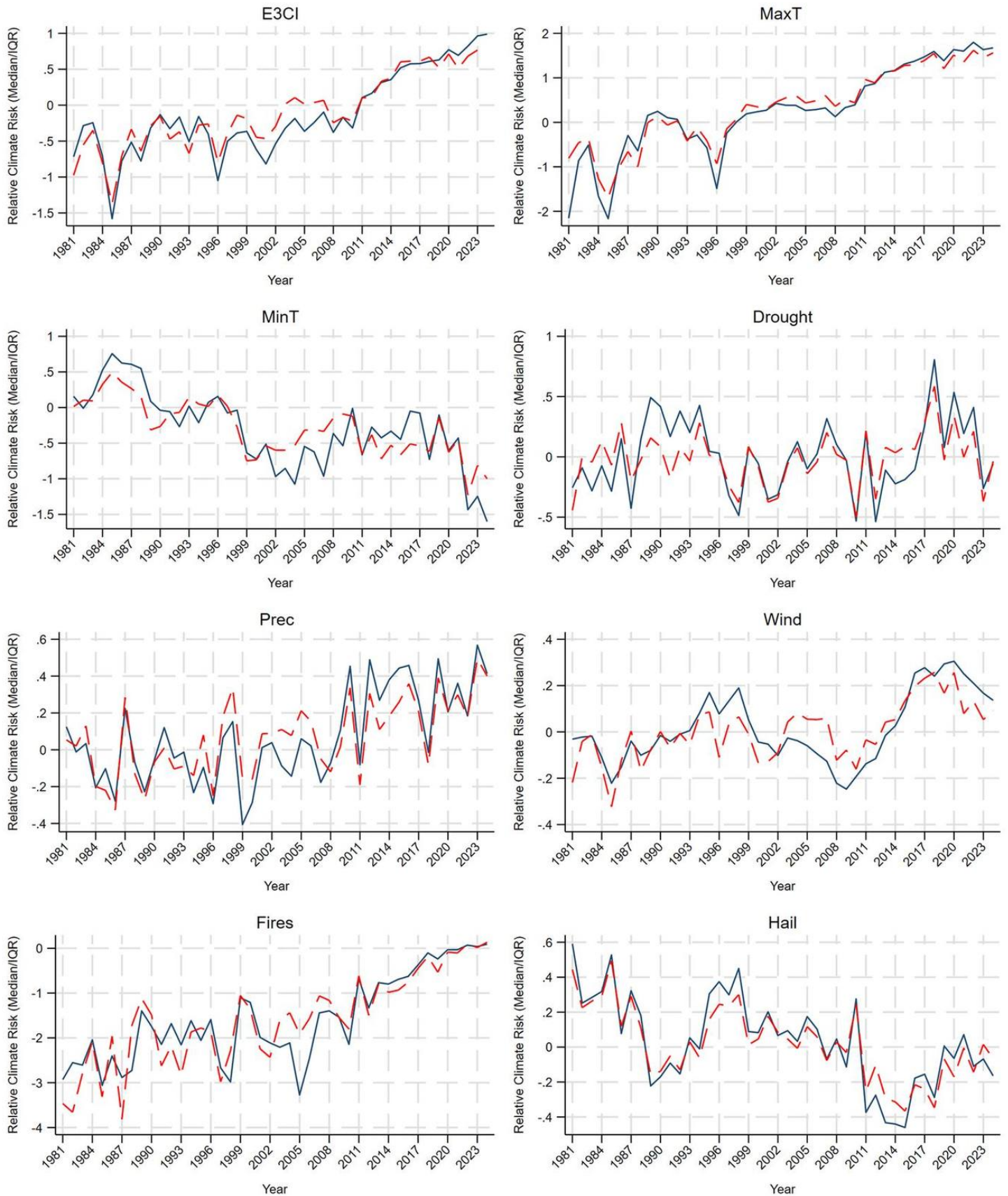
Climate Risk in Europe 1981-2024 - FE vs GETS



Navy solid: FE (pooled Melly-Pons). Red dash: GETS (per-country).

Figure A7. Aggregate conditional median functions (climate risk) for the E3CI index and its components - extreme maximum and minimum temperatures (MaxT, MinT), extreme wind (Wind), extreme precipitation (Prec), droughts (Drought), wildfires (Fire) and hail (Hail) - obtained from the pooled Melly-Pons fixed-effects first stage (navy solid) and as the cross-country average of the per-country GETS estimates (red dashed).

Relative Climate Risk in Europe 1981-2024 - FE vs GETS



Navy solid: FE (pooled Melly-Pons). Red dash: GETS (per-country).

Figure A8. Aggregate conditional median/interquartile ratio functions (relative climate risk) for the E3CI index and its components - extreme maximum and minimum temperatures (MaxT, MinT), extreme wind (Wind), extreme precipitation (Prec), droughts (Drought), wildfires (Fire) and hail (Hail) - obtained from the pooled Melly-Pons fixed-effects first stage (navy solid) and as the cross-country average of the per-country GETS estimates (red dashed).

E3CI geography, terciles: IQR, Median and Median/IQR change

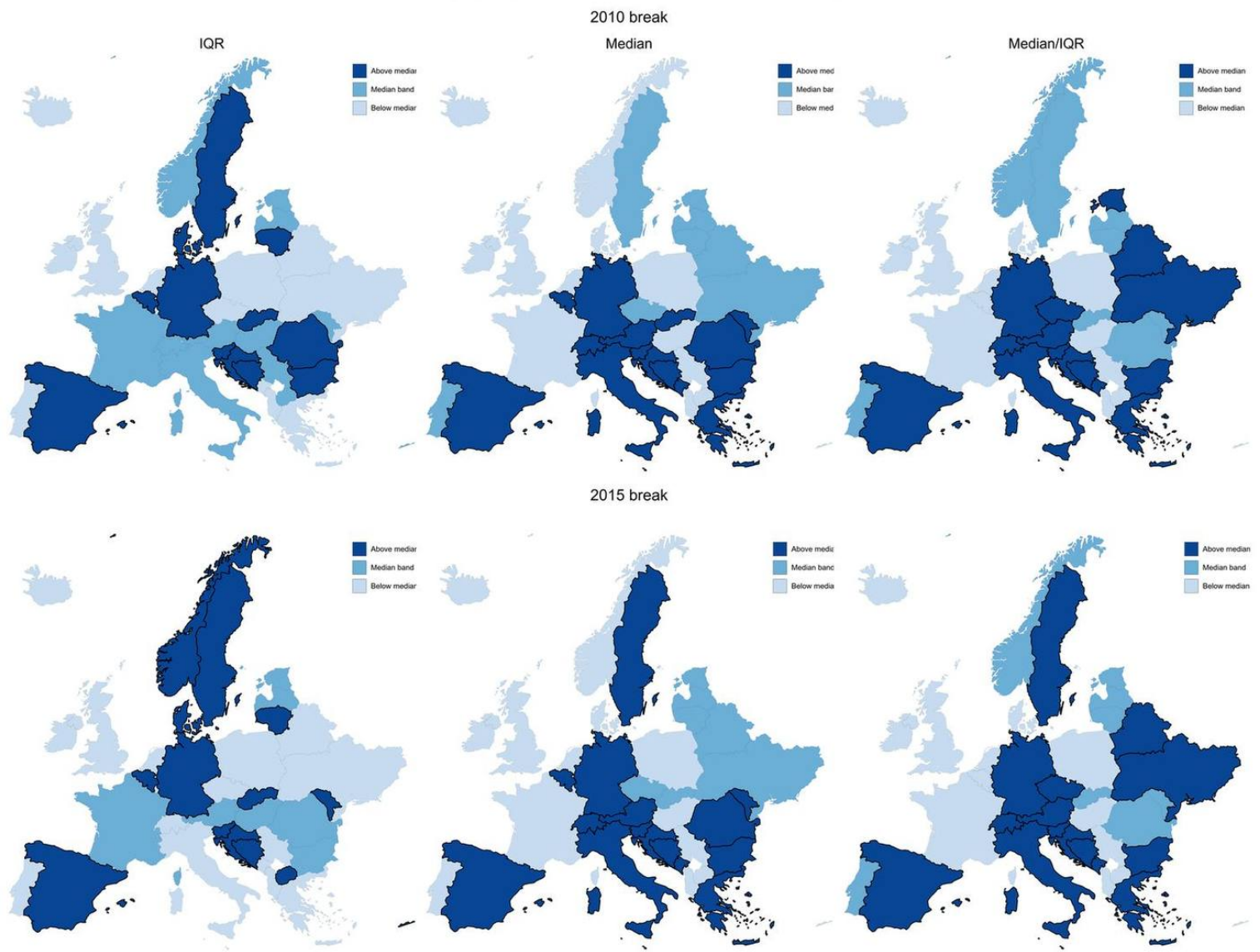


Figure A9. The plots map the country-level change in the conditional IQR, median (MED), and MED/IQR ratio of the E3CI index, computed as the post-break average relative to the pre-break average. The breakpoint is 2010 for the top plots and 2015 for the bottom plots. Values are standardized across countries and grouped into three percentile bands: below the 40th percentile ("below median"), between the 40th and 60th ("median band"), and above the 60th ("above median"). Countries shaded dark blue therefore experienced a post-2010 increase in climate-risk level above the cross-country median.

E3CI Median & IQR geography (terciles) and PC1 x PC2 quadrants (2015 break)

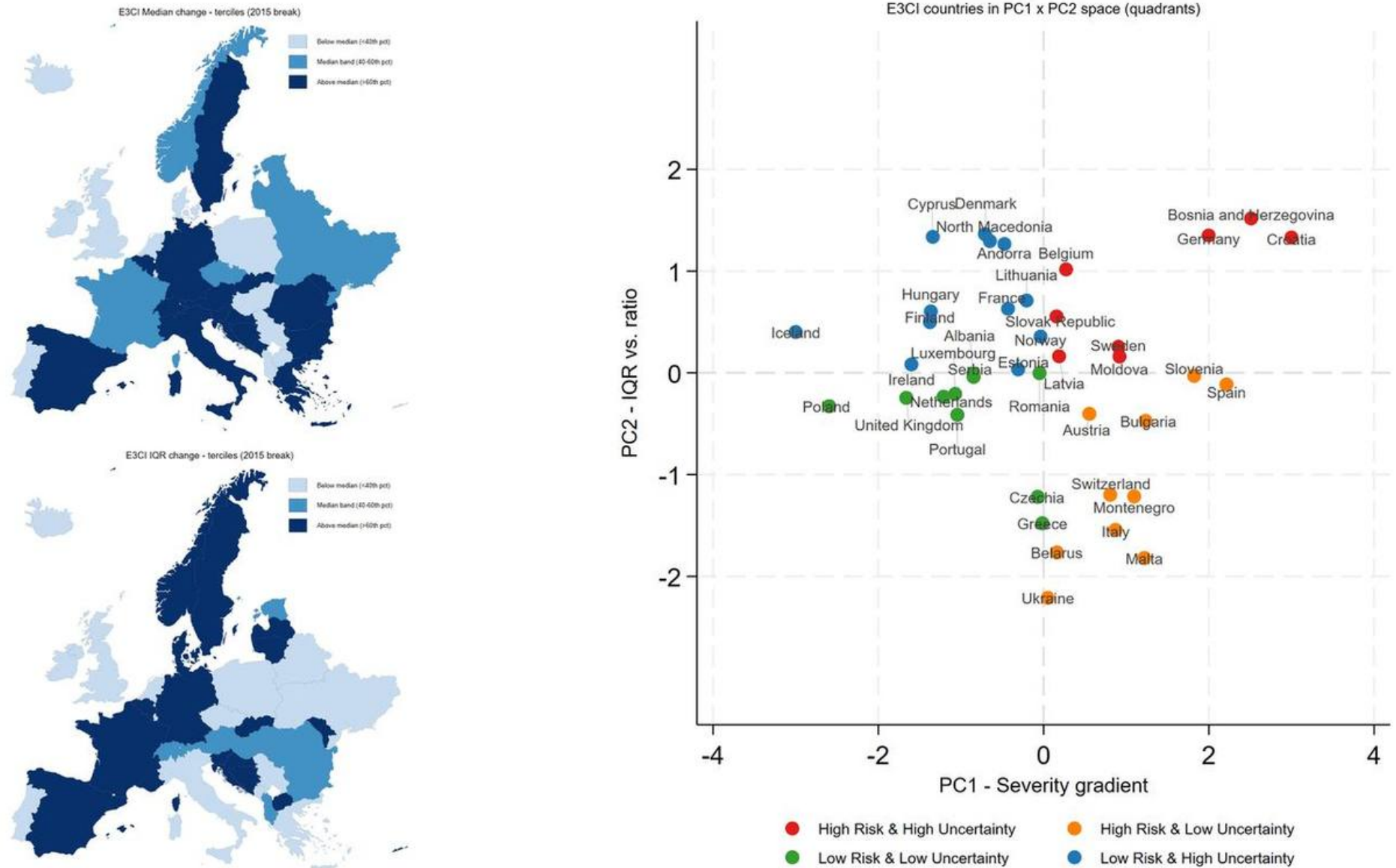


Figure A10. The left-hand panel maps the country-level change in the conditional median (top plot) and IQR (bottom plot) of the E3CI index, computed as the post-break average relative to the pre-break average. The breakpoint is 2015. Values are standardized across countries and grouped into three percentile bands: below the 40th percentile ("below median"), between the 40th and 60th ("median band"), and above the 60th ("above median"). Countries shaded dark blue therefore experienced a post-2015 increase in climate-risk level above the cross-country median. The right-hand panel positions each country by its scores on the first two principal components extracted from the standardized post-pre differences of the three moments (median, IQR, and MED/IQR ratio), coloring each country by the quadrant it occupies (the sign of each score, split at the mean-zero origin). The first component (PC1, horizontal) is a severity gradient. The second component (PC2, vertical) is a modality contrast.

E3CI 7 components - per-component Median and IQR change (z, 2015 break) - countries in common (Median) order

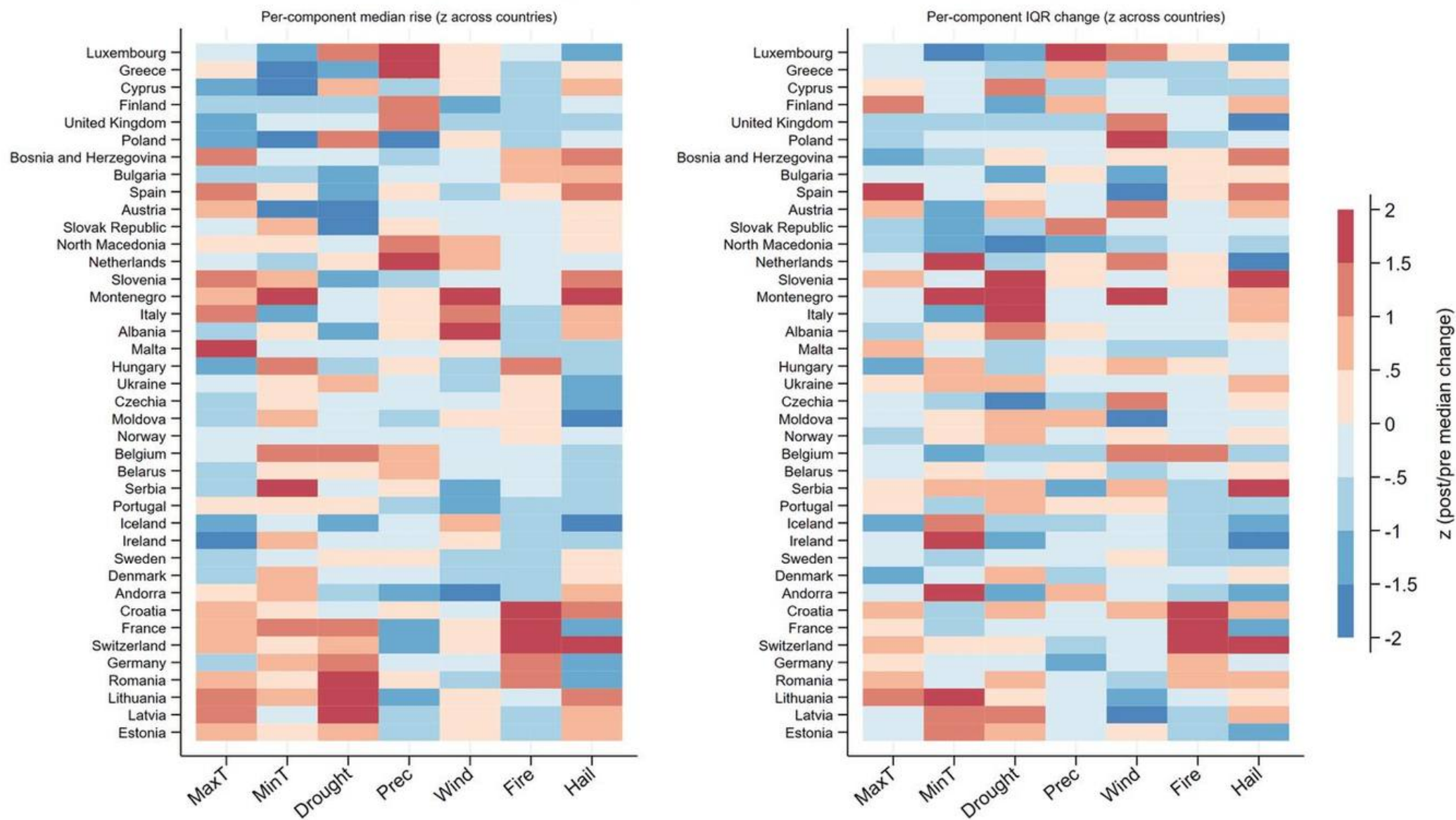


Figure A11. Per-component decomposition of the median climate-risk and uncertainty change after the 2015 break. Each row is one of the 40 European countries and each column one of the seven E3CI hazard components (MaxT, MinT, Drought, Prec, Wind, Fire, and Hail). Cell shading is the post/pre change in the conditional median (left-hand plot) or the IQR (right-hand plot) of that component, standardized across countries (z-scores) and capped at ± 2 standard deviations for display; on the diverging red-blue scale, red denotes an above-average rise in that hazard and blue a below-average change, with near-white cells close to the cross-country mean.

E3CI 7 components (median, realigned to 2010) - PCA quadrant scatters (2015 break)

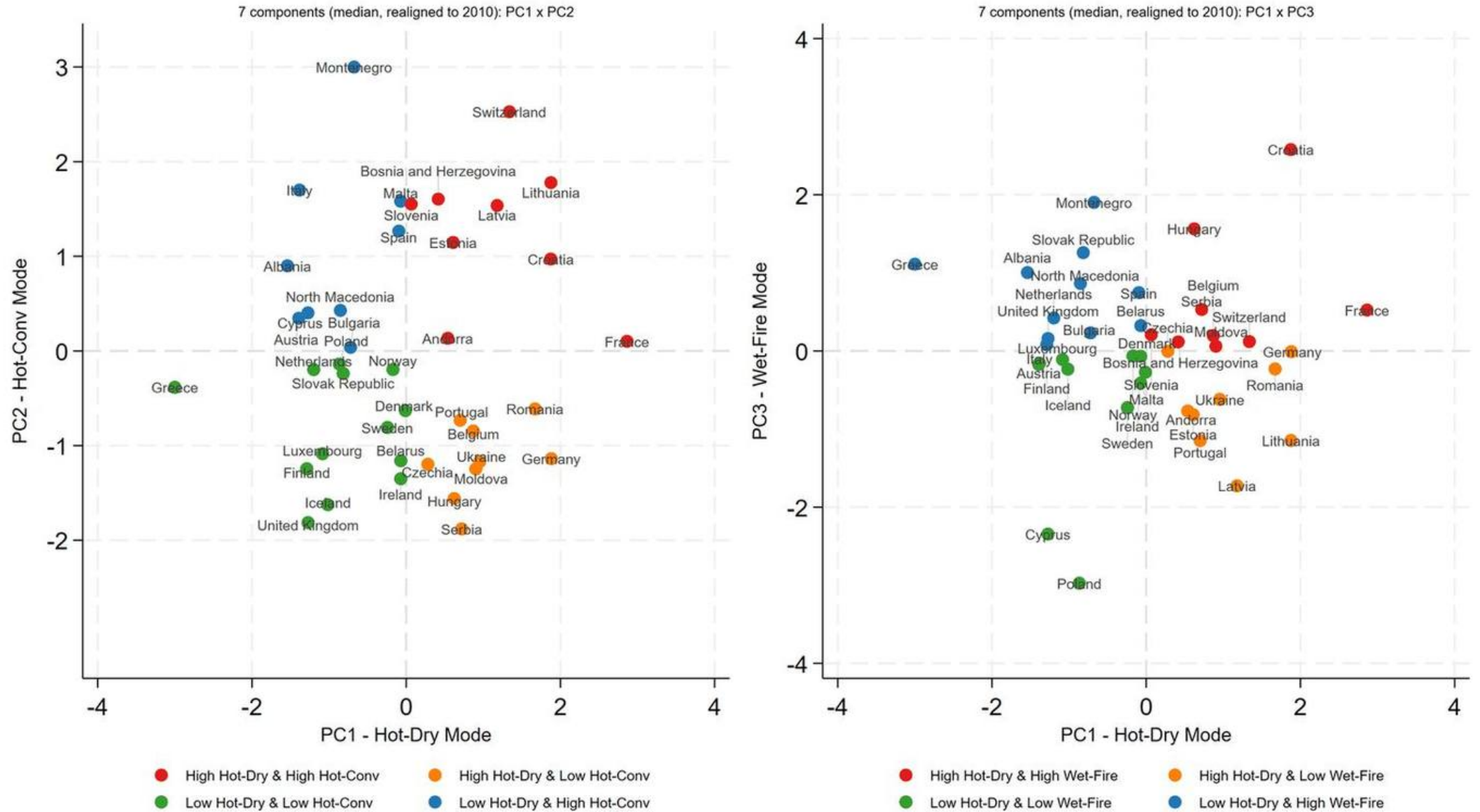


Figure A12. Country positions in the principal-component space of the seven-component Median change, after the 2015 break. Both panels plot the same 40 countries by their scores on the principal components extracted from the standardized post/pre change in the conditional median of the seven E3CI hazards. Component signs are oriented so that higher scores correspond to the named mode. PC1 is the Hot-Dry-Convective mode, PC2 the Hot-Wet-Convective mode, and PC3 the Wet-Fire mode. Each country is colored by the quadrant it occupies, split at the mean-zero origin.

E3CI 7 components (IQR) - PCA quadrant scatters (2015 break)

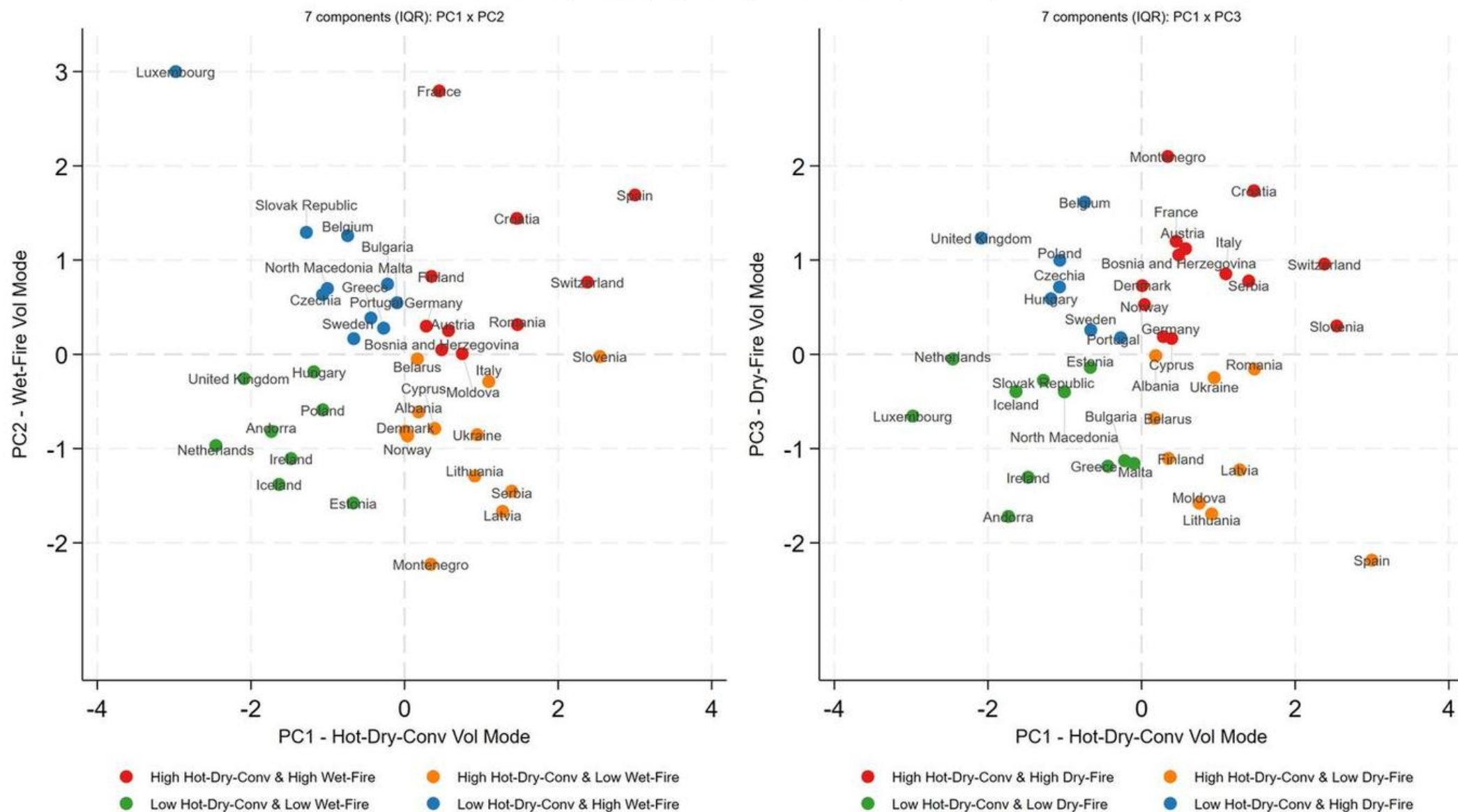


Figure A13. Country positions in the principal-component space of the seven-component IQR change, after the 2015 break. Both panels plot the same 40 countries by their scores on the principal components extracted from the standardized post/pre change in the conditional IQR of the seven E3CI hazards. Component signs are oriented so that higher scores correspond to the named mode. PC1 is the Hot-Dry-Convective Volatility mode, PC2 the Wet-Fire Volatility mode, and PC3 the Dry-Fire Volatility mode. Each country is colored by the quadrant it occupies, with the split at the mean-zero origin.

E3CI 7-component risk zones: Median realigned to 2010 (left) and IQR (right), 2015 break

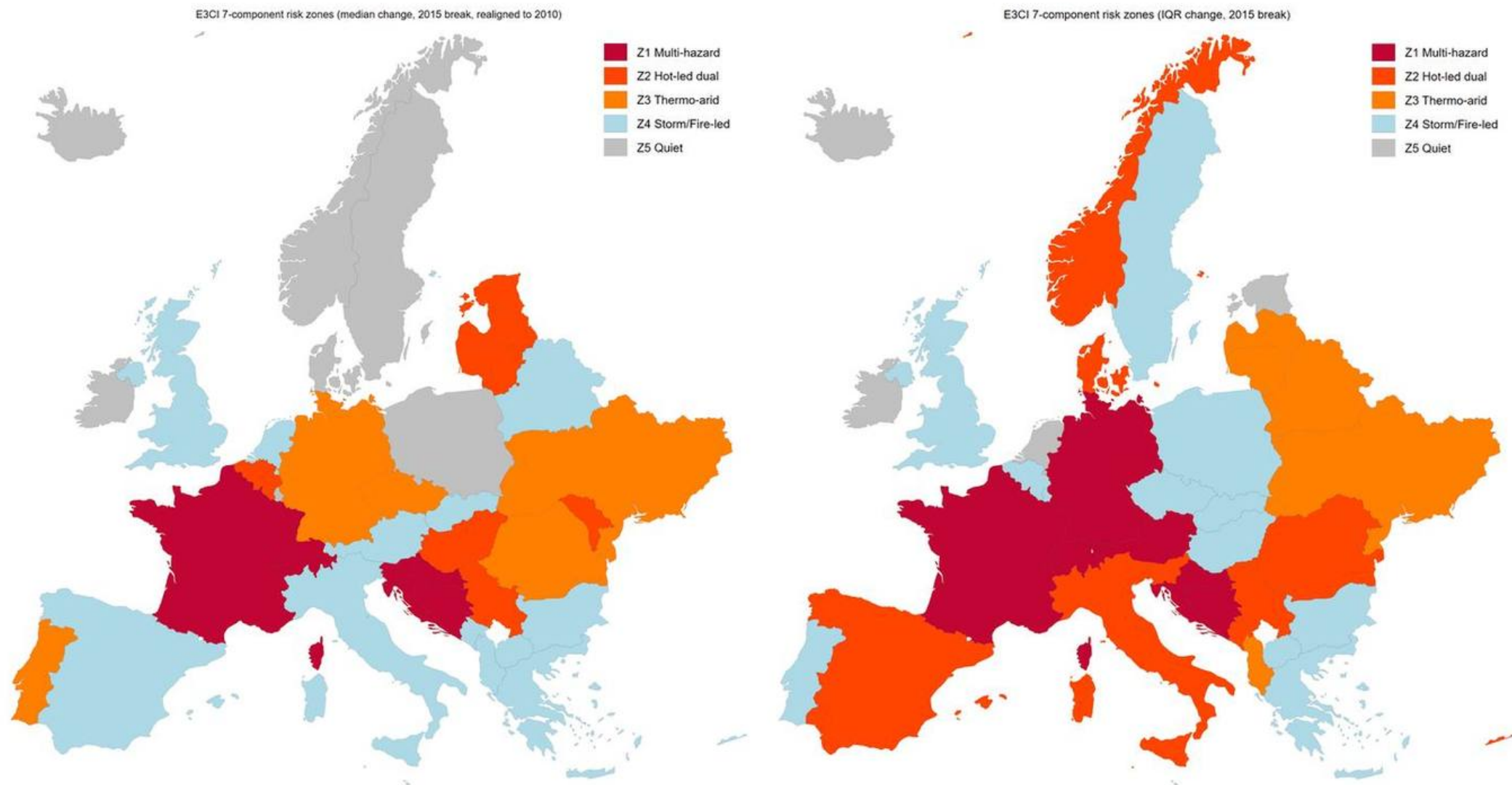


Figure A14. E3CI seven-component risk zones, 2015 break: median change realigned to the 2010 basis (left) and IQR change (right). Each country is assigned to one of five zones by a deterministic partition of its three-mode octant (flag order PC1, PC2, PC3): Z1 Multi-hazard = HHH; Z2 Hot-led dual = HHL or HLH; Z3 Thermo-arid = HLL; Z4 Storm/Fire-led = LHH, LHL or LLH; Z5 Quiet = LLL. "High" denotes a positive sign-oriented component score. The octant-to-zone rule is identical across the two panels; only the meaning of the modes differs: for the median (level), realigned by orthogonal Procrustes to the 2010 basis, PC1/PC2/PC3 are the 2010 Hot-Dry / Hot-Conv / Wet-Fire modes, while for the IQR (dispersion) they are the Hot-Dry-Conv Vol / Wet-Fire Vol / Dry-Fire Vol changes.

IQR: Climate Uncertainty by Country — Post/Pre 2011

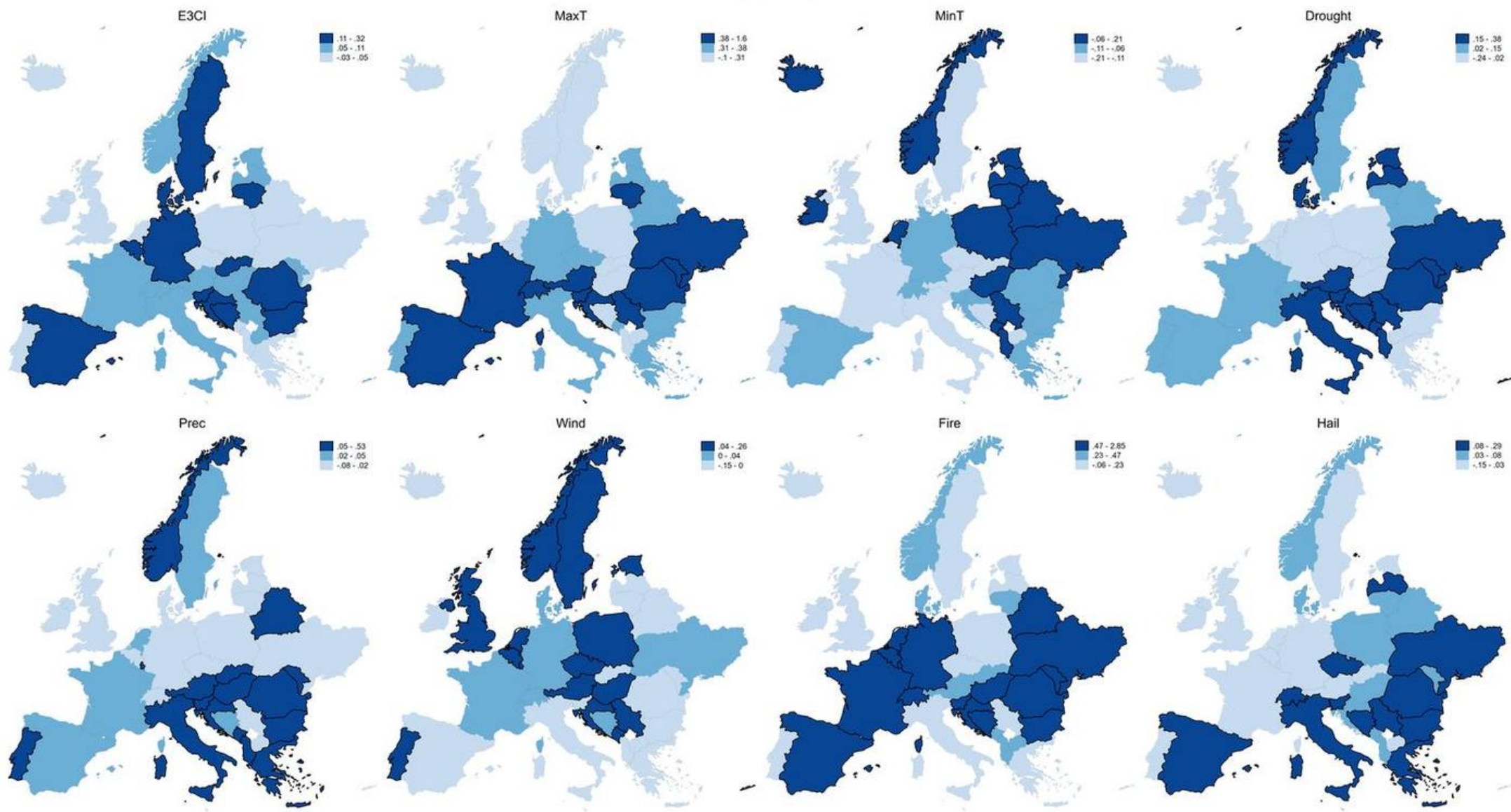


Figure A15 shows the countrylevel average IQR difference computed for the post-break period relative to the pre-break period. Grouping is on tertiles around the crosscountry median for the E3CI index and its components.

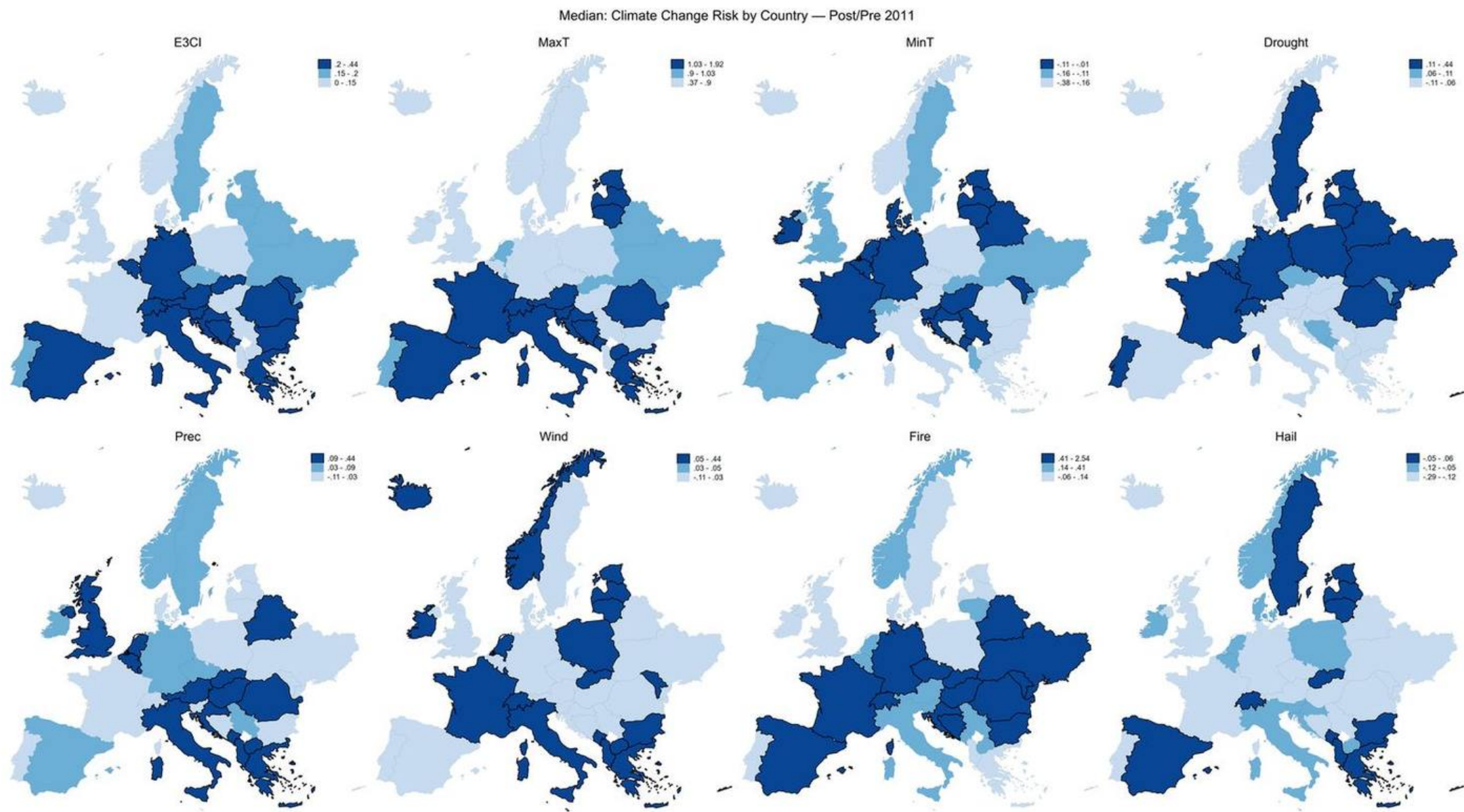


Figure A16 shows the countrylevel average Median difference computed for the post-break period relative to the prebreak period. Grouping is on tertiles around the crosscountry median for the E3CI index and its components.

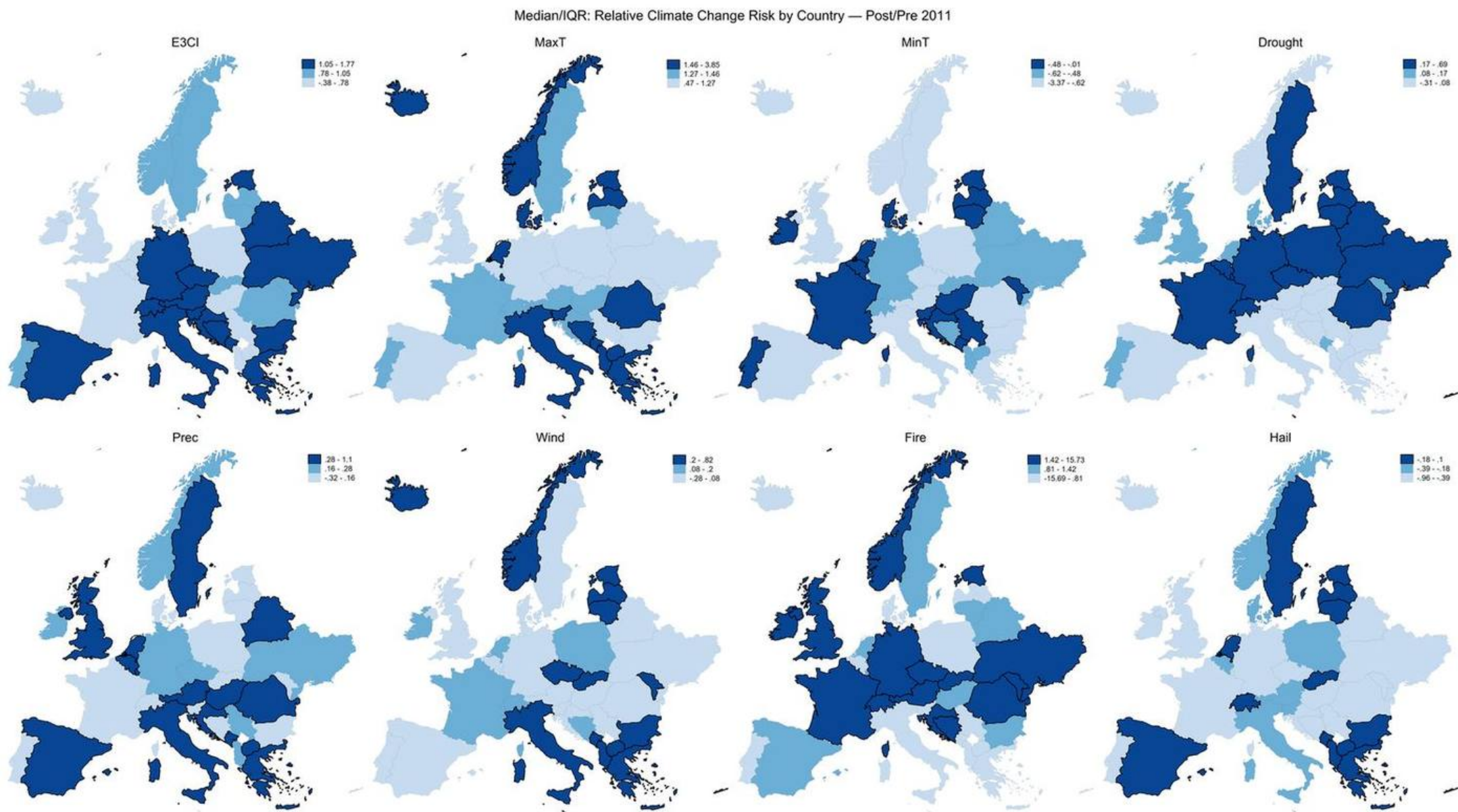


Figure A17 shows the countrylevel average Median/IQR ratio difference computed for the post-break period relative to the pre-break period. Grouping is based on tertiles around the crosscountry median for the E3CI index and its components.

IQR: Climate Uncertainty by Country — Post/Pre 2016

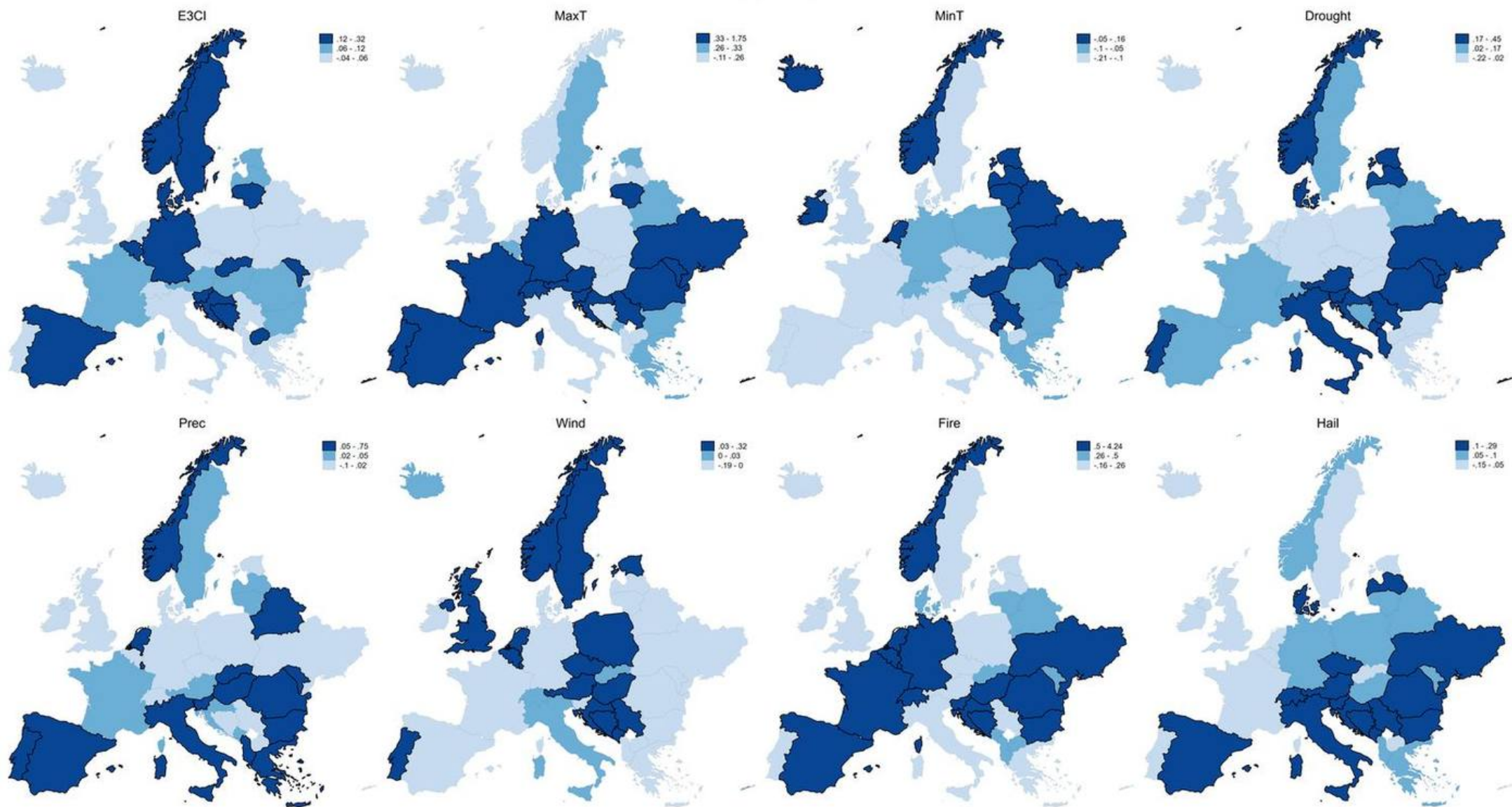


Figure A18 shows the countrylevel average IQR difference computed for the post-break period relative to the pre-break period. Grouping is on tertiles around the crosscountry median for the E3CI index and its components.

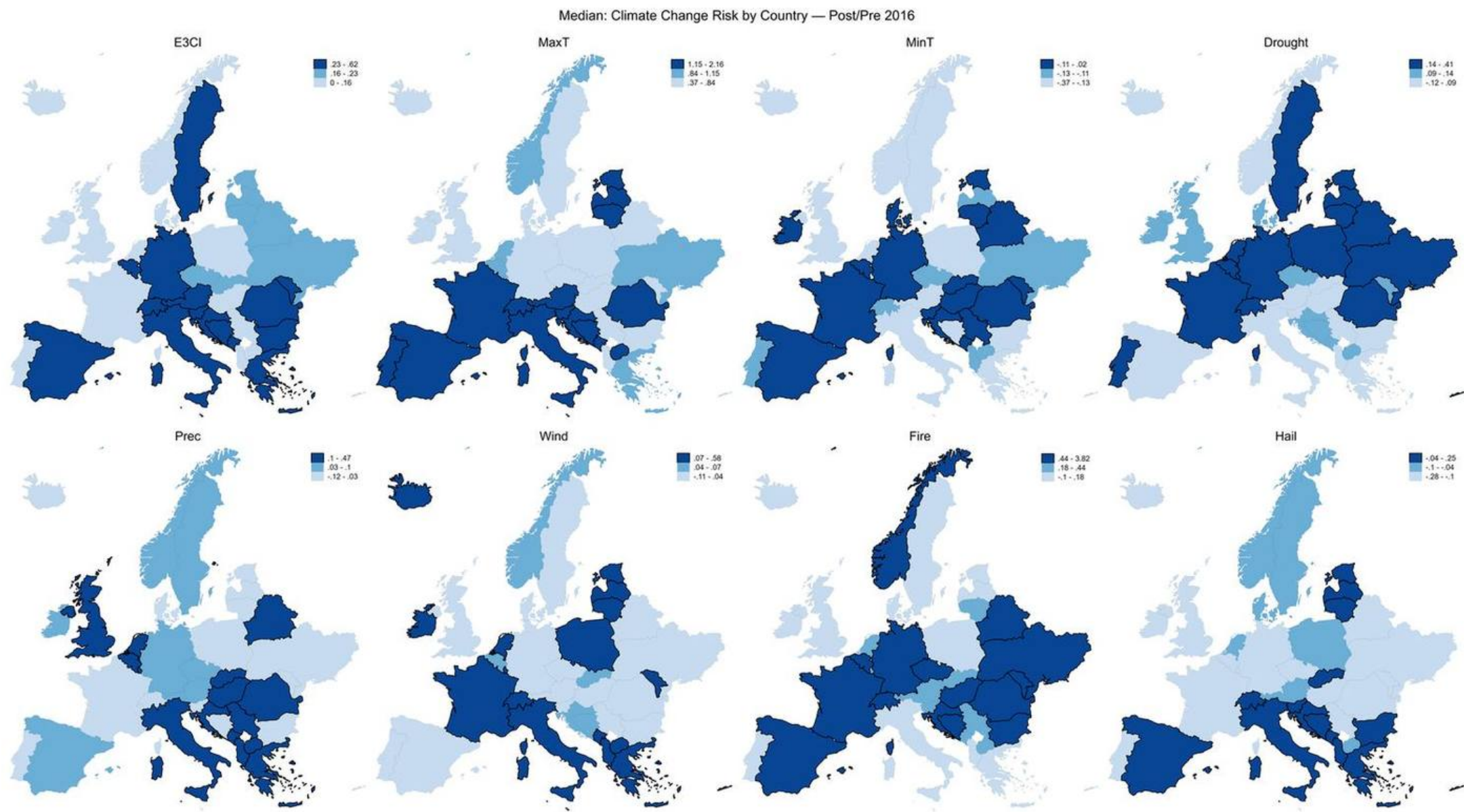


Figure A19 shows the countrylevel average Median difference computed for the post-break period relative to the prebreak period. Grouping is on tertiles around the crosscountry median for the E3CI index and its components.

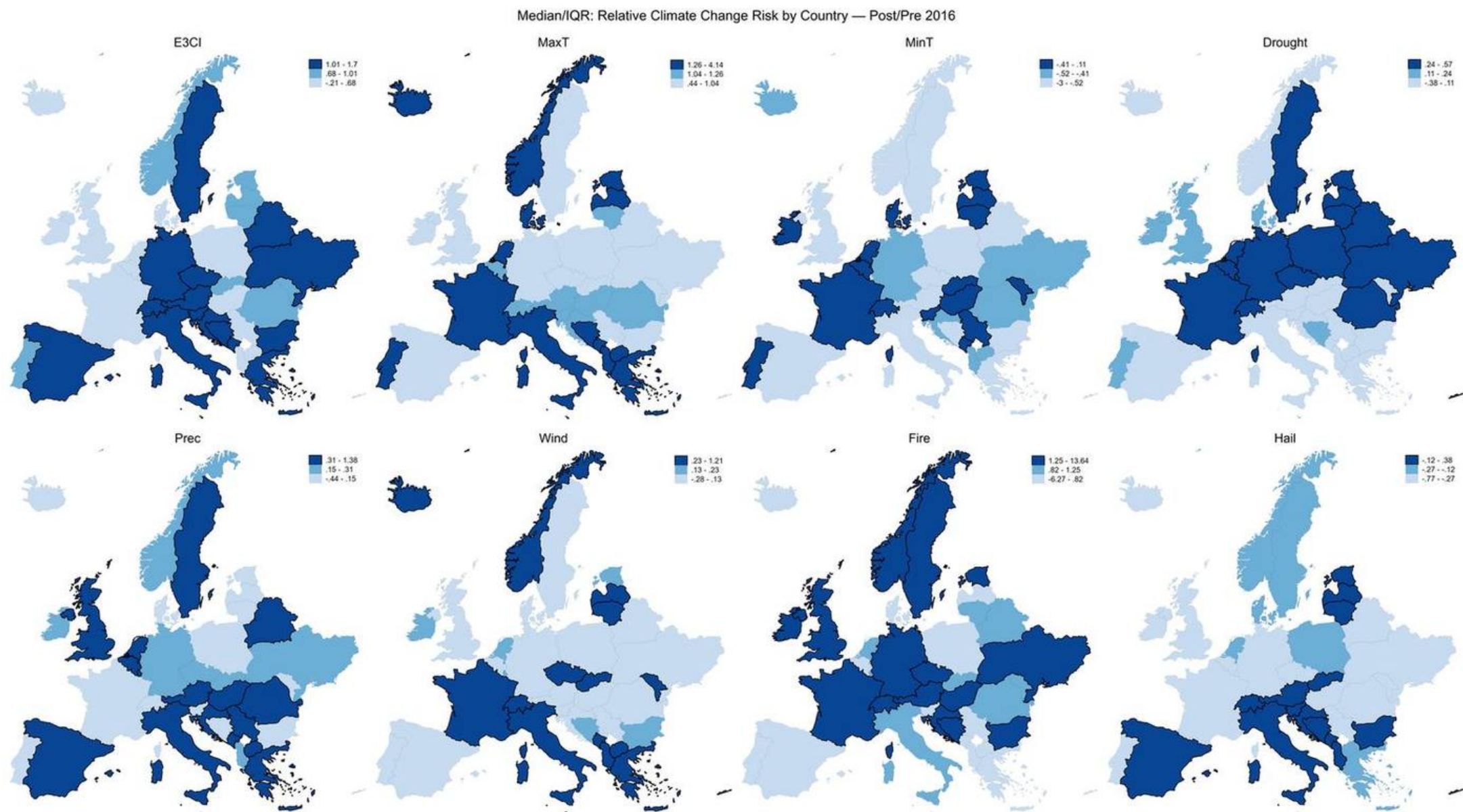


Figure A20 shows the countrylevel average Median/IQR ratio difference computed for the post-break period relative to the prebreak period. Grouping is on tertiles around the cross-country median for the E3CI index and its components.