

Supplementary Information

Appendix 1: List of Figure

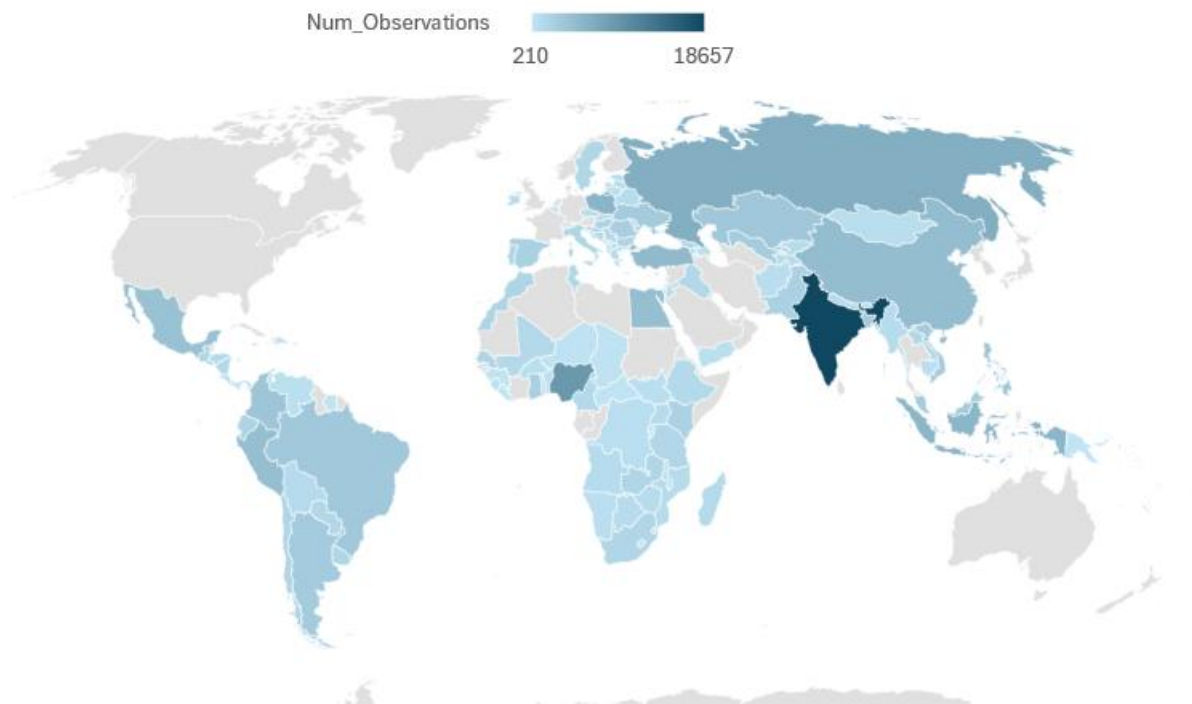


Figure S1: Spatial coverage of firm-level observations across 125 countries

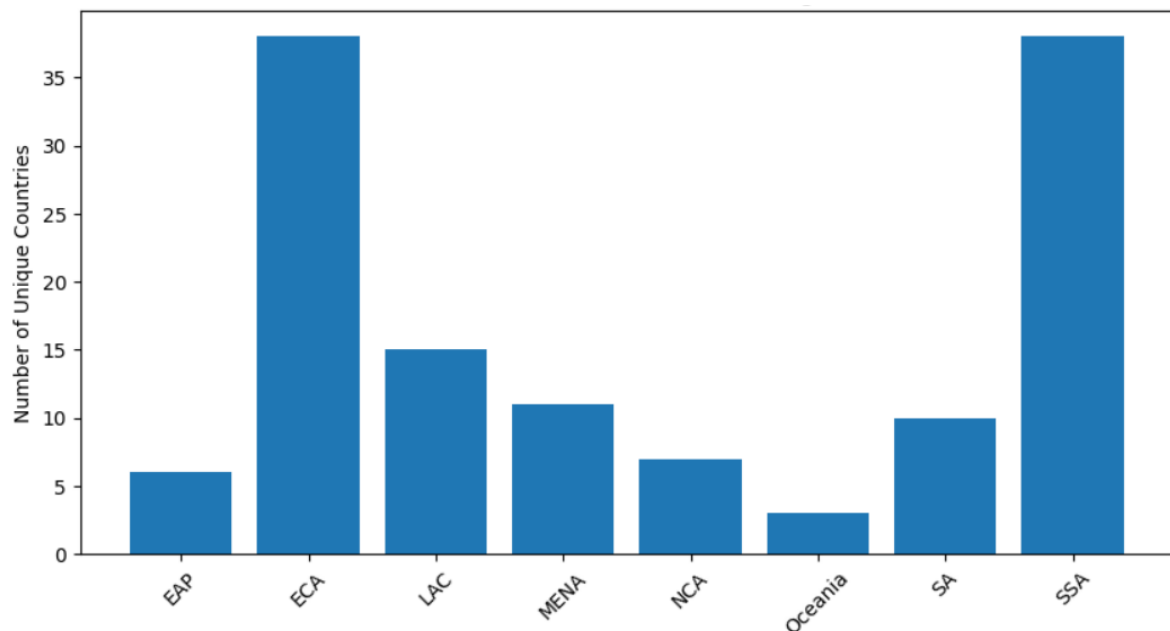


Figure S2: Regional distribution of observations by country count. EAP (East Asia and the Pacific), ECA (Europe and Central Asia), LAC (Latin America and the Caribbean), MENA (Middle East and North Africa), NCA (North and Central America), Oceania, SA (South Asia), and SSA (Sub-Saharan Africa).

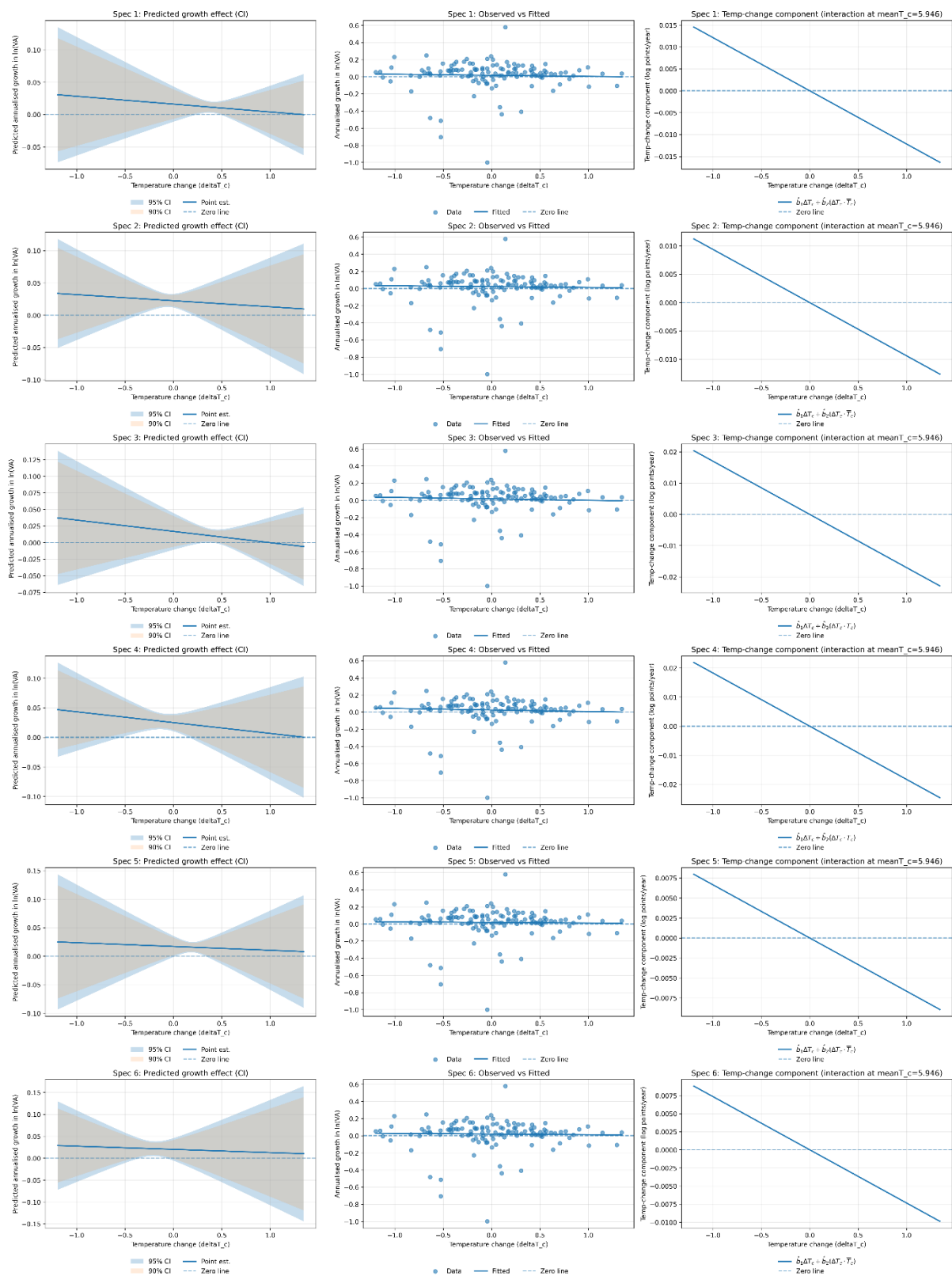


Figure S3: First column: Predicted growth effect with confidence interval (CI) bound; second column: observed vs fitted model specifications; third column: damage function (temperature change with interaction at mean temperature). Rows represent each model specifications (spec1 - 6).

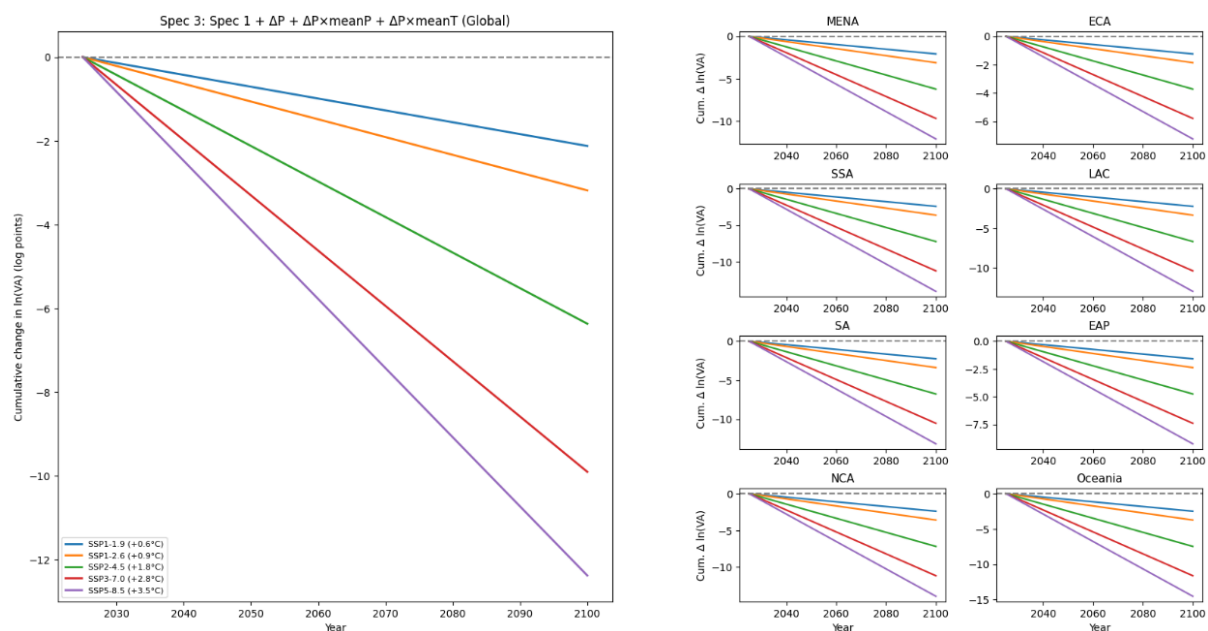


Figure S4: Warming scenarios projection for specification 3 (global) and 4 (regional).

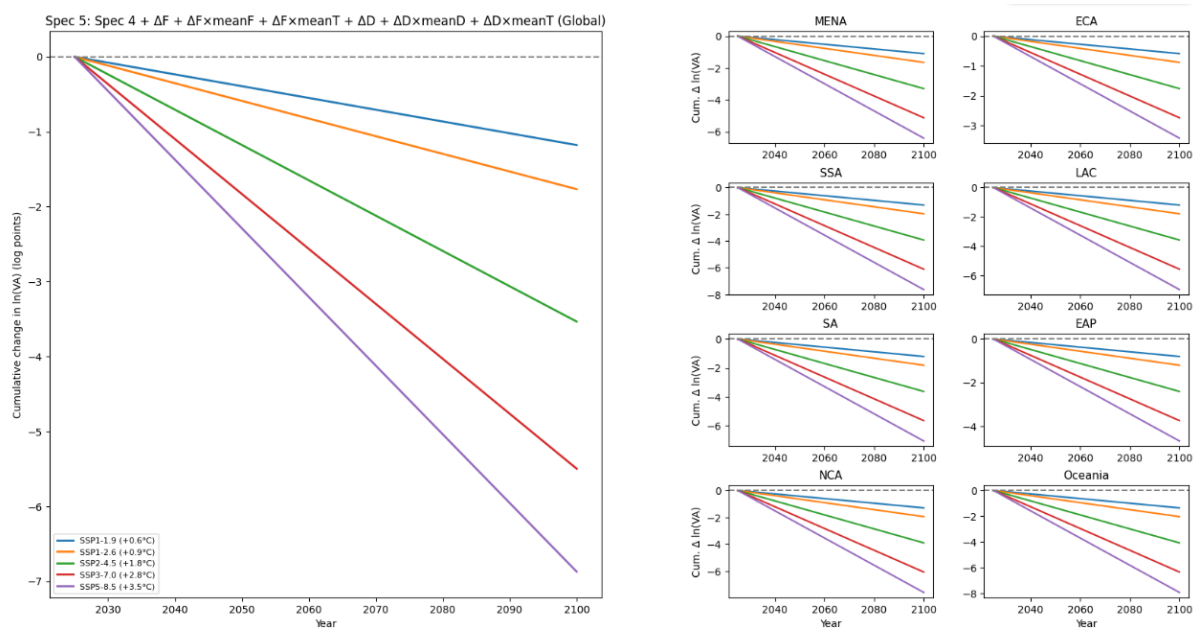


Figure S5: Warming scenarios projection for specification 5 (global) and 6 (regional).

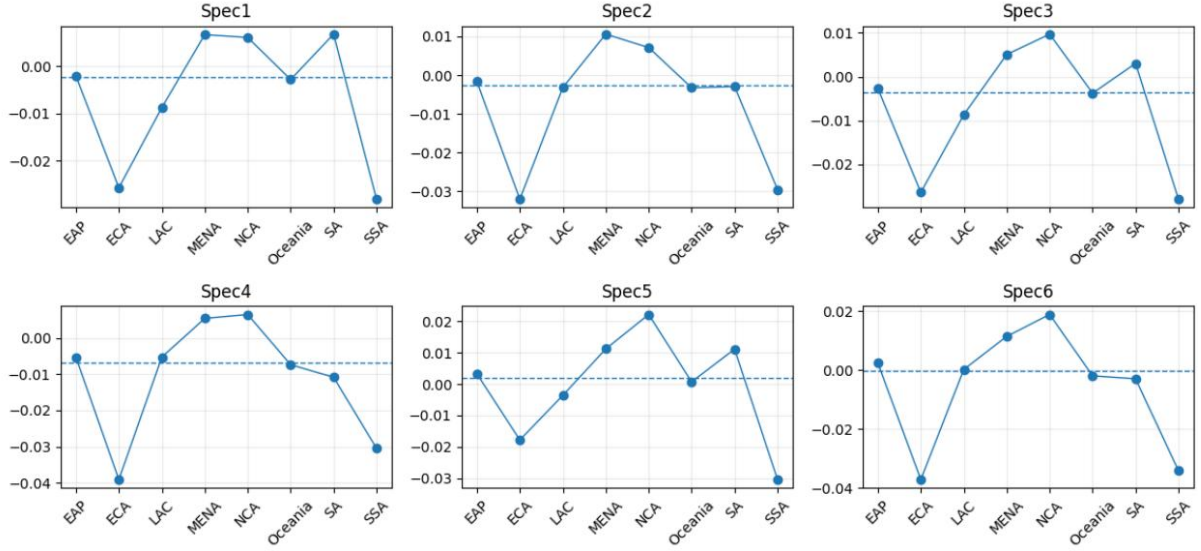


Figure S6: Leave-one-region-out. γ_1 (change in temperature term) by dropped region. Dashed line indicates full sample.

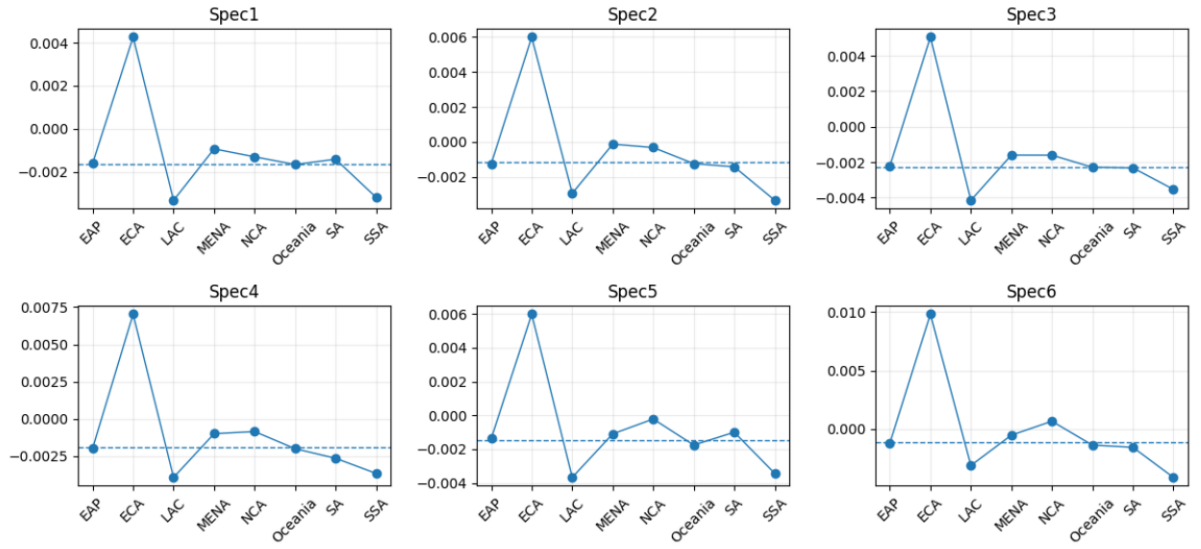


Figure S7: Leave-one-region-out. γ_2 (nonlinear temperature term) by dropped region. Dashed line indicates full sample.

Appendix 2: List of Tables

Variable	N	Mean	Std. Dev.	Min	Median	Max	IQR
$\ln VA_{icrt}$	201677	16.57	2.89	10.28	16.31	24.69	4.04
T_{crt}	201677	18.67	7.83	-4.05	21.69	29.79	12.57
$T_{crt_anomaly}$	201677	1.05	0.54	-0.54	0.99	2.59	0.71
P_{crt}	196721	1208.38	794.68	8.88	1040.05	4897.40	845.06
F_{crt}	201677	1.37	1.89	1.00e-05	0.76	16.66	1.96
D_{crt}	201677	57.87	53.51	5.34	41.54	329.24	54.15

Table S1. Summary Statistics. Notes: Summary statistics are computed from firm-level data. Large and small values are reported in scientific (e) notation. IQR denotes the interquartile range.

	$\ln VA_{icrt}$	T_{crt}	$T_{crt_anomaly}$	P_{crt}	F_{crt}	D_{crt}
$\ln VA_{icrt}$	1.000	0.080	-0.036	0.147	0.163	-0.033
T_{crt}	0.080	1.000	-0.344	0.352	0.349	0.303
$T_{crt_anomaly}$	-0.036	-0.344	1.000	-0.285	-0.343	-0.062
P_{crt}	0.147	0.352	-0.285	1.000	0.807	-0.479
F_{crt}	0.163	0.349	-0.343	0.807	1.000	-0.229
D_{crt}	-0.033	0.303	-0.062	-0.479	-0.229	1.000

Table S2. Correlation Matrix. Notes: Pairwise Pearson correlation coefficients. All values are reported to three decimal places.

Variable	VIF
$\widetilde{\Delta F_{cr}} \times \widetilde{\widetilde{F_{cr}}}$	19.378
$\widetilde{\Delta P_{cr}} \times \widetilde{\widetilde{P_{cr}}}$	16.688
$\widetilde{\Delta F_{cr}}$	15.400
$\widetilde{\widetilde{P_{cr}}}$	7.255
$\widetilde{\Delta F_{cr}} \times \widetilde{\widetilde{T_{cr}}}$	6.604
$\widetilde{\Delta P_{cr}}$	5.172
$\widetilde{\widetilde{F_{cr}}}$	5.071
$\widetilde{\Delta P_{cr}} \times \widetilde{\widetilde{T_{cr}}}$	3.541
$\widetilde{\widetilde{D_{cr}}}$	3.213
$\widetilde{\Delta \widetilde{D_{cr}}}$	2.308
$\widetilde{\widetilde{T_{cr}}}$	2.171
$\widetilde{\Delta \widetilde{D_{cr}}} \times \widetilde{\widetilde{\widetilde{D_{cr}}}}$	2.121
$\widetilde{\Delta \widetilde{D_{cr}}} \times \widetilde{\widetilde{\widetilde{T_{cr}}}}$	1.626
$\widetilde{\Delta \widetilde{T_{cr}}}$	1.248
$\widetilde{\Delta \widetilde{T_{cr}}} \times \widetilde{\widetilde{\widetilde{T_{cr}}}}$	1.240

Table S3: Variance Inflation Factors (VIF). This table reports variance inflation factors for the long-difference climate regressors and their interaction terms. Variables were mean centred prior to interaction construction.

Specification	Scenario	ΔT (°C)	2040 (H=15) Cumulative $\Delta \ln(VA)$	2060 (H=35) Cumulative $\Delta \ln(VA)$	2100 (H=75) Cumulative $\Delta \ln(VA)$
Spec1	SSP1-1.9 (+0.6°C)	0.6	-0.3050	-0.7117	-1.5250
Spec1	SSP1-2.6 (+0.9°C)	0.9	-0.4575	-1.0675	-2.2875
Spec1	SSP2-4.5 (+1.8°C)	1.8	-0.9150	-2.1350	-4.5750
Spec1	SSP3-7.0 (+2.8°C)	2.8	-1.4233	-3.3211	-7.1166
Spec1	SSP5-8.5 (+3.5°C)	3.5	-1.7791	-4.1513	-8.8957
Spec2	SSP1-1.9 (+0.6°C)	0.6	-0.2223	-0.5187	-1.1115
Spec2	SSP1-2.6 (+0.9°C)	0.9	-0.3335	-0.7781	-1.6673
Spec2	SSP2-4.5 (+1.8°C)	1.8	-0.6669	-1.5561	-3.3345
Spec2	SSP3-7.0 (+2.8°C)	2.8	-1.0374	-2.4206	-5.1870
Spec2	SSP5-8.5 (+3.5°C)	3.5	-1.2968	-3.0258	-6.4838
Spec3	SSP1-1.9 (+0.6°C)	0.6	-0.4245	-0.9906	-2.1226
Spec3	SSP1-2.6 (+0.9°C)	0.9	-0.6368	-1.4858	-3.1840
Spec3	SSP2-4.5 (+1.8°C)	1.8	-1.2736	-2.9717	-6.3679
Spec3	SSP3-7.0 (+2.8°C)	2.8	-1.9811	-4.6226	-9.9056
Spec3	SSP5-8.5 (+3.5°C)	3.5	-2.4764	-5.7783	-12.3821
Spec4	SSP1-1.9 (+0.6°C)	0.6	-0.3947	-0.9209	-1.9733
Spec4	SSP1-2.6 (+0.9°C)	0.9	-0.5920	-1.3813	-2.9600
Spec4	SSP2-4.5 (+1.8°C)	1.8	-1.1840	-2.7627	-5.9200
Spec4	SSP3-7.0 (+2.8°C)	2.8	-1.8418	-4.2975	-9.2090
Spec4	SSP5-8.5 (+3.5°C)	3.5	-2.3022	-5.3719	-11.5112
Spec5	SSP1-1.9 (+0.6°C)	0.6	-0.2357	-0.5499	-1.1784
Spec5	SSP1-2.6 (+0.9°C)	0.9	-0.3535	-0.8249	-1.7676
Spec5	SSP2-4.5 (+1.8°C)	1.8	-0.7070	-1.6497	-3.5351
Spec5	SSP3-7.0 (+2.8°C)	2.8	-1.0998	-2.5662	-5.4991

Spec5	SSP5-8.5 (+3.5°C)	3.5	-1.3748	-3.2078	-6.8739
Spec6	SSP1-1.9 (+0.6°C)	0.6	-0.2074	-0.4839	-1.0369
Spec6	SSP1-2.6 (+0.9°C)	0.9	-0.3111	-0.7258	-1.5554
Spec6	SSP2-4.5 (+1.8°C)	1.8	-0.6221	-1.4517	-3.1107
Spec6	SSP3-7.0 (+2.8°C)	2.8	-0.9678	-2.2581	-4.8389
Spec6	SSP5-8.5 (+3.5°C)	3.5	-1.2097	-2.8227	-6.0486

Table S4: Climate Loss Estimates (Specs 1–6) across warming scenarios and time horizon using sample mean baseline of 19.1480 °C

Region	List of Countries	Number of Countries
EAP	China, Indonesia, Vietnam, Malaysia, Philippines, Mongolia	6
ECA	Albania, Armenia, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Georgia, Greece, Hungary, Ireland, Italy, Kazakhstan, Kosovo, Kyrgyz Republic, Latvia, Moldova, Lithuania, Malta, Romania, Montenegro, North Macedonia, Poland, Tajikistan, Turkey, Uzbekistan, Portugal, Russia, Serbia, Slovak Republic, Slovenia, Spain, Sweden, Ukraine	38
LAC	Argentina, Barbados, Colombia, Bolivia, Brazil, Chile, Dominican Republic, Ecuador, Jamaica, Peru, Paraguay, Trinidad and Tobago, Suriname, Uruguay, Venezuela	15
MENA	Afghanistan, Iraq, West Bank and Gaza, Yemen, Israel, Egypt, Jordan, Lebanon, Morocco, Pakistan, Tunisia	11
NCA	Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama	7
Oceania	Samoa, Vanuatu, Tonga	3
SA	Bangladesh, Bhutan, Cambodia, India, Indonesia, Lao PDR, Myanmar, Nepal, Philippines, Timor-Leste	10
SSA	Angola, Benin, Botswana, Burkina Faso, Burundi, Central African Republic, Cape Verde, Cameroon, Chad, Côte d'Ivoire, DRC, Eswatini, Ghana, Zambia, Zimbabwe, Guinea, Ethiopia, Kenya, Lesotho, Liberia, Malawi, Mali, Mauritius, Mexico, Mozambique, Madagascar, Rwanda, Senegal, South Sudan, Niger, Nigeria, Namibia, Papua New Guinea, Tanzania, Togo, Sierra Leone, South Africa, Uganda	38
World	Total World Countries Covered	125

Table S5: Observed regions and countries

Country	Num Observations	Unique Years	Num Unique Years
Afghanistan	985	2005, 2009	2
Albania	912	2009, 2013, 2019	3
Angola	1215	2006, 2010, 2024	3
Argentina	3108	2006, 2010, 2017	3
Armenia	1280	2009, 2013, 2019	3
Azerbaijan	995	2009, 2013, 2019	3
Bangladesh	3196	2007, 2011, 2013	3
Barbados	303	2010, 2023	2
Belarus	1233	2008, 2013, 2018	3
Belgium	934	2020, 2024	2
Benin	861	2004, 2009, 2016, 2024	4
Bhutan	658	2009, 2015, 2024	3
Bolivia	1339	2006, 2010, 2017	3
Bosnia and Herzegovina	1434	2009, 2013, 2019, 2023	4
Botswana	1232	2006, 2010, 2023	3
Brazil	3444	2003, 2009	2
Bulgaria	2063	2009, 2013, 2019, 2023	4
Burkina Faso	913	2006, 2009, 2024	3
Burundi	318	2014, 2025	2
Cambodia	892	2016, 2023	2
Cameroon	1546	2006, 2009, 2016, 2024	4
Cape Verde	417	2006, 2009, 2024	3
Central African Republic	301	2011, 2023	2
Chad	467	2009, 2018, 2023	3
Chile	2050	2006, 2010	2
China	4889	2012, 2024	2
Colombia	3854	2006, 2010, 2017, 2023	4
Costa Rica	895	2010, 2023	2
Croatia	2036	2007, 2009, 2013, 2019, 2023	5
Cyprus	486	2019, 2024	2
Czech Republic	1006	2009, 2013, 2019	3
Côte d'Ivoire	1536	2009, 2016, 2023	3
DRC	888	2010, 2013	2
Dominican Republic	719	2010, 2016	2
Ecuador	2183	2003, 2006, 2010, 2017, 2024	5
Egypt	4711	2013, 2016	2
El Salvador	2501	2006, 2010, 2016, 2023	4
Estonia	1266	2009, 2013, 2019, 2023	4
Eswatini	306	2016, 2024	2
Ethiopia	1492	2011, 2015	2
Georgia	1906	2008, 2013, 2019, 2023	4
Ghana	2640	2007, 2013, 2023	3
Greece	1200	2018, 2023	2
Guatemala	1912	2003, 2006, 2010, 2017	4
Guinea	310	2016, 2025	2
Honduras	1578	2003, 2006, 2010, 2016	4
Hungary	2237	2009, 2013, 2019, 2023	4
India	18657	2014, 2022	2
Indonesia	5719	2009, 2015, 2023	3

Iraq	1775	2011, 2022	2
Ireland	1215	2020, 2024	2
Israel	871	2013, 2024	2
Italy	1976	2019, 2024	2
Jamaica	591	2010, 2024	2
Jordan	1174	2013, 2019	2
Kazakhstan	3603	2009, 2013, 2019, 2024	4
Kenya	2439	2007, 2013, 2018	3
Kosovo	743	2009, 2013, 2019	3
Kyrgyz Republic	1219	2009, 2013, 2019, 2023	4
Lao PDR	1802	2009, 2012, 2016, 2018, 2024	5
Latvia	1326	2009, 2013, 2019, 2024	4
Lebanon	1093	2013, 2019	2
Lesotho	450	2016, 2023	2
Liberia	459	2009, 2017, 2025	3
Lithuania	904	2009, 2013, 2019	3
Madagascar	1379	2009, 2013, 2022	3
Malawi	826	2009, 2014, 2025	3
Malaysia	3200	2015, 2019, 2024	3
Mali	1582	2003, 2007, 2010, 2016, 2024	5
Malta	483	2019, 2024	2
Mauritius	1483	2009, 2020, 2023	3
Mexico	4282	2006, 2010, 2023	3
Moldova	1387	2009, 2013, 2019, 2024	4
Mongolia	1082	2009, 2013, 2019	3
Montenegro	567	2009, 2013, 2019, 2023	4
Morocco	2101	2013, 2019, 2023	3
Mozambique	1200	2007, 2018	2
Myanmar	1239	2014, 2016	2
Namibia	887	2014, 2024	2
Nepal	1432	2009, 2013, 2023	3
Nicaragua	1599	2003, 2006, 2010, 2016	4
Niger	439	2005, 2009, 2017	3
Nigeria	9263	2007, 2009, 2014, 2025	4
North Macedonia	1086	2009, 2013, 2019	3
Pakistan	2547	2013, 2022	2
Panama	969	2006, 2010	2
Papua New Guinea	210	2015, 2024	2
Paraguay	1716	2006, 2010, 2017, 2023	4
Peru	4622	2006, 2010, 2017, 2023	4
Philippines	3663	2009, 2015, 2023	3
Poland	5816	2009, 2013, 2019, 2024, 2025	5
Portugal	2069	2019, 2023	2
Romania	2861	2009, 2013, 2019, 2023	4
Russia	6547	2009, 2012, 2019	3
Rwanda	1171	2006, 2011, 2019, 2023	4
Samoa	266	2009, 2023	2
Senegal	2091	2003, 2007, 2014, 2024	4
Serbia	1611	2009, 2013, 2019, 2024	4
Sierra Leone	511	2009, 2017, 2023	3
Slovak Republic	1436	2009, 2013, 2019, 2024	4
Slovenia	1357	2009, 2013, 2019, 2024	4
South Africa	2028	2007, 2020	2

South Sudan	895	2014, 2024	2
Spain	2482	2021, 2024	2
Suriname	385	2010, 2018	2
Sweden	1791	2014, 2020, 2024	3
Tajikistan	1435	2008, 2013, 2019, 2024	4
Tanzania	1832	2006, 2013, 2023	3
Timor-Leste	514	2009, 2015, 2021	3
Togo	453	2009, 2016, 2023	3
Tonga	300	2009, 2024	2
Trinidad and Tobago	484	2010, 2025	2
Tunisia	1852	2013, 2020, 2024	3
Turkey	5235	2005, 2008, 2013, 2024	4
Uganda	1325	2006, 2013	2
Ukraine	3190	2008, 2013, 2019	3
Uruguay	1935	2006, 2010, 2017, 2024	4
Uzbekistan	3003	2008, 2013, 2019, 2024	4
Vanuatu	239	2009, 2023	2
Venezuela	820	2006, 2010	2
Vietnam	3199	2005, 2009, 2015	3
West Bank and Gaza	1159	2013, 2019, 2023	3
Yemen	830	2010, 2013	2
Zambia	1924	2007, 2013, 2019	3
Zimbabwe	1199	2011, 2016	2
Total	232152		

Table S6: List of observed countries, number of observed firms, observation years, and number of survey wave.