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An Exploration of Trends in Normalized Weather-related Catastrophe Losses

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In order to evaluate potential trends in global weather-related catastrophe losses, it is important to compensate for changes in asset values and exposures over time. Here we survey weather-related catastrophe losses from 1950 through 2005 from regions in the principal developed (Australia, Canada, Europe, Japan, South Korea, United States) and developing (Caribbean, Central America, China, India, the Philippines) regions of the world. We normalize losses to 2005 U.S. dollars by adjusting for changes in wealth, inflation and population, and look for the existence of trends for the full record, and from 1970 onwards (when the global record becomes more comprehensive). After normalization, one would expect the trend in weather-related catastrophe losses to be driven primarily by climatic changes over this period, along with changing vulnerability. To test for the prior, we examine the relationship between global normalized catastrophe losses and the global temperature increase. We also examine trends in normalized losses by peril and by region, and compare these to observed climatological records of trends to extract how closely the normalized losses relate to peril event records. Trends in tropical cyclones are examined in detail in this respect.