Are Global Economic Losses from Natural Hazards Increasing?

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1. ABSTRACT

Economic losses from natural hazards are assessed for the period 1995-2013. Global and regional results appear to suggest socioeconomic factors rather than the natural hazards themselves are the main drivers of perceived increase in economic losses over the past 20 years. The average annual economic losses presented herein could be used as a benchmark for the Sendai Framework which aims to “Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030”

3. METHODS

A database of economic losses by event was compiled from publically available Swiss Re Sigma reports for the period 1995-2013. Reported losses were normalised relative to the base year of 2013 according to the equation:

\[ D_b = D_y \times \frac{I_y}{I_y} \times \frac{GDP_b}{GDP_y} \times \frac{Echg_y}{Echg_b} \]

Where \( D_b \) is the normalised damage (USD) for the base year; \( D_y \) is the reported value (USD) for year \( y \); \( I_y \) is the inflation adjustment; \( GDP_y \) and \( GDP_b \) is the national or regional adjustment for wealth and population and \( Echg_y \) is the exchange rate adjustment. Compiled economic event losses were distributed to the affected countries using AIR's historical loss footprints or the relative GDP. A yearly correction to scale the sum of global compiled event losses was made to be consistent with the total reported economic loss (Swiss Re).

4. NORMALISED GLOBAL ECONOMIC LOSSES

Figure 1. Comparison of un-normalised (green) and normalised (blue) global economic loss time series for natural hazards. Although it is beyond the scope of this poster to illustrate regional normalised economic loss times series, none of the regions exhibit a statistically significant trend over the studied period.

5. CONCLUSIONS: GLOBAL & REGIONAL LOSS INDICES

The absence of global and regional trends in economic losses after normalisation likely indicates that socioeconomic factors rather than the natural hazards themselves are driving the observed annual increase in total economic loss.

Sendai Framework for Disaster Risk Reduction 2015-2030 aims to “Reduce direct disaster economic loss in relation to GDP by 2030”. To monitor this target we propose the use of a global/regional loss index:

\[ \text{Global/Regional Loss Index in year } y = \frac{\text{Global/Regional economic loss index in year } y}{\text{Global/Regional GDP in year } y} \]

The long-term averages provide benchmarks for future economic losses and a means of assessing the effectiveness of mitigation strategies and building design codes.

Historically the insurance industry has been the custodian of economic loss data. Yet a plethora of factors could mitigate strategies and building design codes. To investigate, historical loss estimates need to be “normalised”.

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