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Climate Change and Its Implications for the Insurance Industry

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Authors' note: The insurance sector was not one of the sectors included in the National Climate Assessment report. However, it is one of the largest sectors globally and also one of primary importance in Nebraska. The commentary below is provided to raise awareness of the concerns of this sector with regard to climate change and, specifically, the increasing frequency of extreme climatic events.

Commentary:

Climate Change and Its Implications for the Insurance Industry

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As noted previously, climate change will lead to a probable increase in the occurrence of weather-related disaster events. These events could lead to declining revenue in the insurance industry, the world's largest economic sector, with revenue of \$4.6 trillion per year, or 7% of the global economy (Mills, 2012). Climatic events have accounted for 72% of global insurance claims and insured losses from 1980 to 2012, totaling \$0.97 trillion (Munich Re, 2013). Estimated losses are ~0.5% of global Gross Domestic Product (GDP) and losses are increasing at ~6% a year in real terms (Lomborg, 2010). The United Nations Framework Convention on Climate Change estimated total costs could be 1-1.5% of world GDP in 2030, or \$0.85-1.35 trillion per year in 1990 dollars (Lomborg, 2010). It was also recently estimated that \$0.24-0.51 trillion worth of U.S. property will likely be below sea level by 2100 (Bloomberg et al., 2014).

In 2013, the World Economic Forum ranked increasing greenhouse gas emissions as the third highest risk by probability for the global economy and failure of climate-change adaptation as fifth in terms of having the most negative impact for the global economy (WEF, 2013). Expert statistical assessment of risks is often inconsistent with the perception of risk by lay persons and professionals in decision making, as reports suggest (Kahneman, 2011; Kunreuther et al., 2001). People who have recently experienced a catastrophe may find it easier to imagine the catastrophe occurring again and feel a higher perceived risk than people who have

not experienced the catastrophe (Kahneman, 2011; Botzen, 2013).

The National Catastrophe Service (NatCatService) provided by Munich RE, the world's largest reinsurance company, has extensive data on climatic events and natural catastrophes. The increasing occurrence of natural catastrophes in the United States and globally is of great interest to the insurance industry. North America, Central America, and the Caribbean account for the majority of global insured and overall losses. The NatCatService database underestimates damages from climatic events because only large events are included; although many people see the threat of climate change in the form of major natural disasters, 60% of total insured losses come from smaller events (Vellinga et al., 2001).

Insurance claims in the future may increase considerably if climate change projections and socioeconomic developments result in an increased frequency and magnitude of natural catastrophe damage, as reports suggest (Dlugolecki, 2000, 2008; Mills, 2005; Vellinga et al., 2001). Botzen (2013) argues that socioeconomic developments have been the main reason for the rapid increase of the total amount of damage that has been observed in recent years across the globe. The costs of climate change are also more likely to markedly increase if climate change is abrupt instead of gradual (Botzen, 2013; National Academy of Sciences, 2002). Because of the nonlinear changes associated with a

changing climate (for example, projected sea-level rise), experience over the last 50-100 years has been identified as an ineffective predictor of future insurance losses (Mills, 2012).

In 2008, the National Association of Insurance Commissioners (NAIC) noted that “global warming and the associated climate change represent a significant challenge for Americans. As regulators of one of the largest American industries, the insurance industry, it is essential that we assess and, to the extent possible, mitigate the impact global warming will have on insurance” (NAIC, 2008).

In 2010, Nebraska insurance agencies added around \$10.3 billion to the state economy and accounted for 5% of total Nebraska payrolls (Thompson and Goss, 2010). It is also estimated that the insurance industry will add ~67,000 jobs, approximately a 3% gain, between 2008 and 2018 (Thompson and Goss, 2010). Nebraska is one of four states (Connecticut, Iowa, and Wisconsin are the others) with a significantly high proportion of outreach from state insurance agencies, meaning these states are exposed to risks from elsewhere (Thompson and Goss, 2010). Roughly \$4 billion was reported in premiums by property insurance businesses of Nebraska, with \$1.5 billion directly related to weather. Another major source of income for Nebraska insurance is crop insurance. In 2012, Nebraska insurance companies garnered \$850 million in premiums based on farm insurance strictly in Nebraska; this is compared to the \$14.6 billion in farm premiums in the United States as a whole (NAIC, 2013). The state’s wealth and tax revenue is also at risk, with 10% of total GDP coming from insurance and finance alone (NEDED, 2013).

The insurance sector is a potential driver of adaptation to climate change. Mills (2012) notes “the insurance sector is a global clearing-house for climate risks that affect every under-writing area and investment. Where insurers recoil in the face of climate change, consumers will encounter acute affordability issues accompanied by huge holes in this societal safety net. But insurers’ efforts to date demonstrate that market-based mechanisms can support greenhouse-gas emission reductions and adaptation to otherwise unavoidable impacts.” Mills

(2009) also notes “the insurance sector, which is the world’s largest industry in terms of revenue, could be a major partner in managing, spreading, and providing incentives for reducing natural catastrophe risk and, thereby, could promote adaptation to climate change.” While financial relief is the general tool after a catastrophe, the insurance industry may aid society in adapting to increasing risk and may enhance economic resilience to catastrophes by providing incentives for risk reductions (Mills and Lecompte, 2007). Jacques Attali, former president of the European Bank for Reconstruction and Development, went further in his assessment of the future: “Insurance companies will insist that businesses comply with the norms decreed by such agencies in order to reduce climatic disturbances and the damage caused by natural disasters that might follow in their wake” (Attali, 2006). In a recent development, an insurance company is suing the city of Chicago for failing to prevent flooding related to climate change, in what experts suggest could be a landmark case (Lehmann, 2014). A trio of global initiatives has aggregated 129 insurance firms from 29 countries to support climate research and develop adaptation techniques to climate change, but only one in eight companies currently has a formal strategy to adapt to climate change (Mills, 2012).



Grasshopper infestation in a drought-stressed corn field east of Lincoln, June 2002. Increased drought frequency and warmer winters associated with climate change will increase pest infestation in Nebraska.

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