



SOCIETY OF ACTUARIES

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International Survey of Emerging Risks

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Emerging risks surprise us, they sneak up on us, and after they occur everyone wonders why we didn't anticipate them in the first place. Hindsight is, indeed, 20/20. Try to recall how often you thought about the likelihood of the most recent financial bubble or a recent natural disaster prior to its occurrence. Even if you were aware of it and wanted to take action, the markets were unlikely to recognize the risk.

Recently, a group was asked to complete a survey of emerging risks for financial services firms. The International Network of Actuarial Risk Managers (INARM) is a loosely organized group of actuaries who work to share best practices across the six continents where they reside. A total of 86 responses were received during this inaugural survey. The project is likely to be repeated periodically and should receive broader exposure.

Rather than ask responders to create their own list of risks, an existing set was chosen. The World Economic Forum report on global risks, completed in January 2007, listed 23 core risks for the next decade. Respondents were asked to choose their top five emerging risks from this list, and could select other risks in addition. General categories included economic, environmental, geopolitical, societal and technological risks. Not surprisingly, this group primarily chose economic risks as the highest priority. One might hypothesize that the risks of most importance to a group of actuaries would differ from a list compiled by farmers, military officers or technology experts.

The responders were more diverse than the typical actuarial crowd, with 47 percent from outside North America (Chart 1) and 40 percent employed outside the insurance industry (Chart 2. The

charts do not add up to 100 percent due to rounding). As the survey evolves, information such as primary practice area also may be included.

The survey asked for the top five emerging risks from the list, and 369 responses were made using the core risks listed. An additional 18 responses fell in the "other" category. The dominant response, with 57 percent, was oil shock/energy supply interruptions. Given the timing of the survey, in May 2008, it will be interesting to see how this risk stands up in less hostile energy environments. For more detail about the 23 core risks, see the attached glossary of risks.

Four of the top five responses reflected economic risks. In addition to oil, they were:

- Climate change (environmental risk): 40 percent
- Blow up in asset prices/excessive indebtedness: 40 percent
- U.S. current account deficit/fall in U.S. dollar: 38 percent
- Fiscal crises caused by demographic shift: 29 percent

The most interesting response is the last one, which pertains to looking at the trends caused by an aging population and their potential effect on the financial landscape. The business press reports on the other topics on a daily basis. Demographic shifts take longer to reach critical mass.

The next most popular responses are more diverse.

- Pandemics (societal risk): 26 percent
- Chinese economic hard landing (economic risk): 23 percent
- Breakdown of critical information infrastructure (technological risk): 22 percent
- Middle East instability (geopolitical risk): 20 percent



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Chart 1

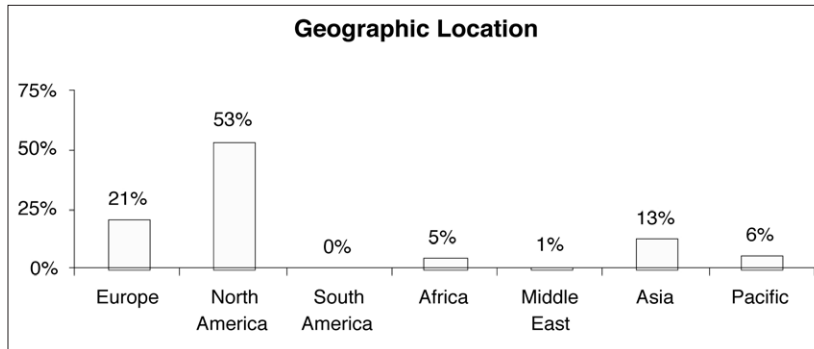
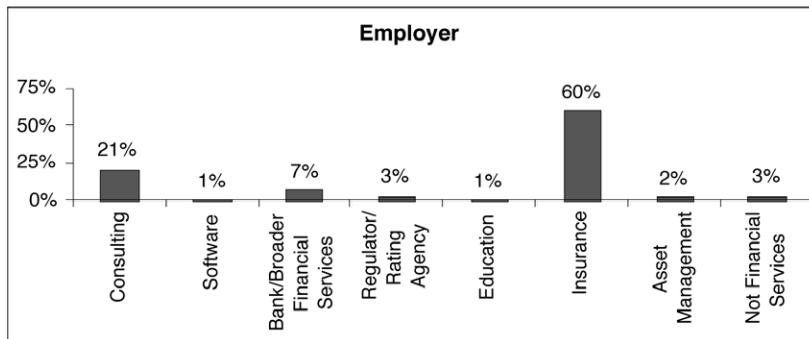


Chart 2



- Chronic diseases in the developed world (societal risk): 10 percent
- Liability regimes (societal risk): 10 percent
- Emergence of risks associated with nanotechnology (technological risk): 8 percent
- Interstate and civil wars (geopolitical risk): 8 percent
- Natural catastrophe: inland flooding (environmental risk): 7 percent
- Proliferation of weapons of mass destruction (geopolitical risk): 7 percent
- Transnational crime and corruption (geopolitical risk): 7 percent
- Natural catastrophe: earthquakes (environmental risk): 5 percent
- Failed and failing states (geopolitical risk): 5 percent

- International terrorism (geopolitical risk): 17 percent

These are the highest-ranking geopolitical risks. It is hard to classify these as emerging risks but instability caused by nation-states and organizations not tethered to physical geographic boundaries will continue to change history and be high-priority risks for world leaders.

Sorted by response rate, here are the remaining 13 risks:

- Retrenchment from globalization (geopolitical risk): 15 percent
- Natural catastrophe: tropical storms (environmental risk): 14 percent
- Loss of freshwater services (environmental risk): 10 percent
- Infectious diseases in the developing world (societal risk): 10 percent

With even the 23rd-highest response rate at 5 percent, the core risks provide a solid group with which to work. The response rates at another point in time would likely yield a different answer. It will be interesting to trend this survey over time. The current focus has been on energy imbalances and the subprime crisis, and that is reflected in the responses. Recent events, such as if a major metropolitan area like Tokyo had been hit by an earthquake or if a nuclear warhead had gone off somewhere in the world, will drive responses to some unknown extent. This is the opposite of the old saying, “Out of sight, out of mind.”

Those who decided that these 23 trends were not broad enough tended to look at societal and economic risks, sometimes combining them. An example of this is the combination of depleted resources and a shift in the balance of power from developed countries with stable populations to developing countries with growing populations. Other examples focused on food shortages, bioengineering developments and several who expressed concern about

the unintended consequences of accounting requirement changes.

Learnings

Any survey is limited by its size and participant expertise, but this group of INARM actuaries has provided a first look at what risk managers are worried about internationally as they gaze into their crystal balls. It also shows the bias that any given group will have based on their knowledge, location and experience. This survey can help other risk professionals, especially actuaries, improve their thought processes regarding emerging risks to provide better insights on the topic.

Functioning risk areas can include this type of information to help their efforts evolve. No matter which industry you are involved in, these risks have the potential to affect your company's results. This survey can help prioritize risk-education efforts. One way is to facilitate a workshop to prioritize current risks. By starting off talking about future risks, it puts some perspective on previous prioritizations and reminds participants that the list must evolve over time and not simply be copied from the last pass.

Glossary of Risks

The following 23 core risks were defined in "Global Risks 2007: A Global Risk Network Report," and can be found at www.weforum.org/pdf/CSI/Long_Global_Risk_Report_2007.pdf. What follows is a summary of these risks.

Economic Risks

- Oil price shock/energy supply interruption—Oil prices rise steeply due to major supply disruption.
- U.S. current account deficit/fall in U.S. dollar—U.S. current account deficit triggers a major fall in the dollar's value.

- Chinese economic hard landing—China's economic growth slows, potentially as a result of protectionism, internal political or economic difficulties.
- Fiscal crises caused by demographics shift—Aging populations in developed economies drive economic stagnation by forcing governments to raise taxes or increase borrowing.
- Blow up in asset prices/excessive indebtedness—Personal assets, such as housing, collapse in the United States and Europe, fueling a recession.

Environmental Risks

- Climate change—Climate change generates both extreme events and gradual changes, affecting infrastructure, agricultural yields and human lives.
- Loss of freshwater services—Water shortages.
- Affect agriculture, businesses and human lives.
- Natural catastrophe: tropical storms—Hurricane or typhoon passes over a heavily populated area, leading to catastrophic economic losses and/or high human death tolls.
- Natural catastrophe: earthquakes—Strong earthquake(s) occur in heavily populated areas.
- Natural catastrophe: inland flooding—Flooding associated with rivers causes significant economic losses, fatalities and disruption.

Geopolitical Risks

- International terrorism—Attacks disrupt economic activity, causing major human and economic losses. Indirectly, attacks aid retrenchment from globalization.
- Proliferation of weapons of mass destruction—Trend fatally weakens the Nuclear Non-

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Proliferation Treaty and leads to the spread of nuclear technologies.

- Interstate and civil wars—Major interstate or civil war breaks out.
- Failed and failing states—Trend of widening gap between order and disorder.
- Trans-national crime and corruption—Corruption continues to be endemic and organized crime successfully penetrates the global economy.
- Middle East instability—The Israel-Palestine conflict and Iraqi civil war continue.
- Retrenchment from globalization—Rising concerns about cheap imports and immigration sharpen protectionism in developed countries. Emerging economies become more nationalist and state-oriented.

Societal Risks

- Pandemics — A pandemic emerges with high mortality among economically productive segments of the population.
- Infectious disease in the developing world —HIV/AIDS continues to spread geographically. Other diseases could develop.
- Chronic disease in the developed world—Obesity, diabetes and cardiovascular diseases become widespread.
- Liability regimes—U.S. liability costs rise by multiples of gross domestic product (GDP) growth, with litigiousness spreading to Europe and Asia.

Technological Risks

- Breakdown of Critical Information Infrastructure (CII)—A major disruption of the availability, reliability and resilience of CII caused by cyber crime, a terrorist attack or technical failure. Results are felt in major infrastructure: power distribution, water supply, transportation, telecommunication, emergency services and finance.
- Emergence of risks associated with nanotechnology—Studies indicate health impairment due to under regulated exposure to a class of commonly used nanoparticles (used in paint, nano-coated clothing, cosmetics or health care), exhibiting unexpected, novel properties and easily entering the human body. ♦