# Large Commercial Risks in Insurance:
# An Asia-Pacific perspective and dataset

With industry data, **Dr Andreas Milidonis** of **Insurance Risk and Finance Research Centre** (IRFRC) analyses and shares the underwriting experiences of insuring large commercial risks in Asia Pacific.

L arge Commercial Risks (LCR) can be defined as insurable risks related to man-made losses (eg fire, explosion, among others), related to commercial lines of business such as commercial, manufacturing, and energy on-shore exposures. LCR constitute a largely unexplored insurance tranche, primarily due to the lack of historical insurance loss data.

A newly completed project by the Insurance Risk and Finance Research Centre (www.IRFRC.com) at Nanyang Technological University, in coordination with Imperial College Business School, London and with the support of the Insurance Intellectual Capital Initiative (IICI), has assembled a unique dataset from Large Commercial Risk losses in Asia-Pacific (APAC) covering the period 2000-2013.

The data was generously contributed by one global reinsurance company and two large Lloyd's syndicates in London. This dataset is the result of the project co-lead by Dr Milidonis (IRFRC and University of Cyprus) and Enrico Biffis (Imperial College Business School), which can be referred to as the "IRFRC LCR Dataset".

### Categorised by economic developments and time period before and after 2008 crisis

As expected, the dataset is fully anonymised, as the LCR losses are aggregated along a few dimensions. First, data is categorised based on the World Bank's economic development classification. This means that losses either come from "developed" or "developing" countries. The second dimension used to aggregate the data is the time period covered. Data is grouped into (at least) two time-periods: the period before and after the 2008 crisis.

The "IRFRC LCR Dataset" is a first step for insurance market participants and academic researchers to understand the typically unexplored area of large commercial risks. Specifically, it provides the following benefits:
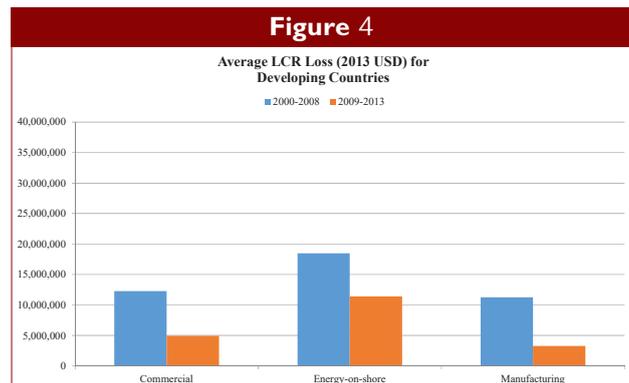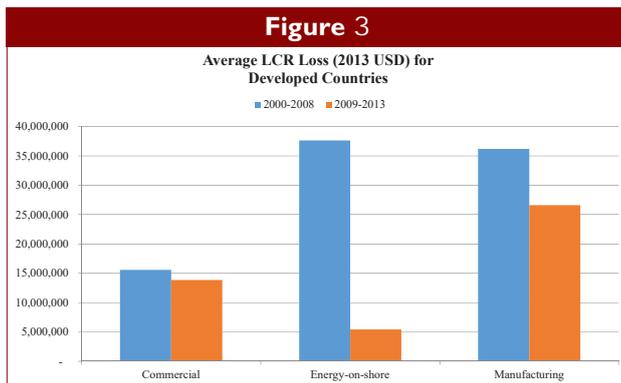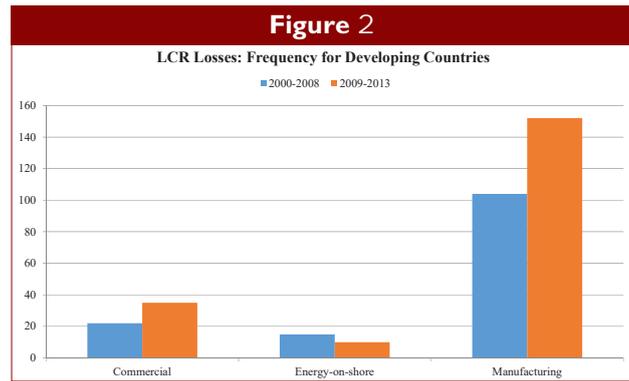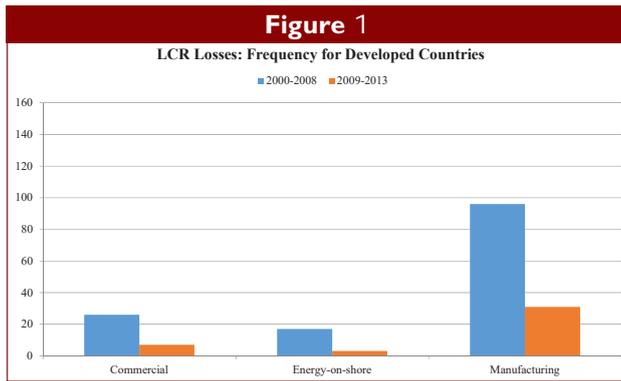
- It is the first publicly available dataset for LCR losses in APAC region, thus providing useful input to insurance-related businesses, academics and regulatory agencies in the region.
- It allows analysis by occupancy type, different time periods and exposures in regions with different economic development
- It allows the identification of potential structural breaks in losses before and after a major event such as the 2008 crisis or the Thai floods in 2011, which continue to be a major reference point for the insurance industry in the APAC region.
- It allows inferences related to LCR premiums quoted in the market.
- In general, it provides more information to both sides of the insurance market (supply and demand) thus allowing the reduction in price volatility currently quoted in the marketplace.

### Call for more data from industry

As mentioned above, the dataset is freely available through the IRFRC website. An extended account of the data collection exercise can be found on the project's report, also downloadable from the IRFRC's website.

Given the ongoing efforts of the project leaders to continue to highlight more aspects of the LCR insurance

## Figure 1

**LCR Losses: Frequency for Developed Countries**



## Figure 2

**LCR Losses: Frequency for Developing Countries**



## Figure 3

**Average LCR Loss (2013 USD) for Developed Countries**



## Figure 4

**Average LCR Loss (2013 USD) for Developing Countries**



business in APAC, it would be beneficial not only for the insurance industry but also for academia if more companies would contribute their LCR loss experience to the "IRFRC LCR Database" by contacting directly the project leaders. (Contact details at end of article).

### IRFRC LCR Dataset

In the charts that follow, we provide some descriptive statistics of the "IRFRC LCR Dataset".

In Figure 1, we show the number of LCR losses (with an insured payment of at least US$150,000) for the three major occupancy categories (commercial, energy-on-shore and manufacturing) in developed countries in APAC. The frequency is shown for the period before and after the 2008 crisis.

Figure 2 shows the same information but for developing countries in APAC.

In Figures 3 and 4 we show the average LCR loss for the same categories as above. Specifically, Figure 3 focuses on the developed regions for the period before and after the 2008 crisis while Figure 4 focuses on the developing countries.

The data is analysed in three major steps. First, loss modelling methodology is used to analyse the tail characteristics of LCR losses, primarily by applying the Generalised Pareto distribution.

Second, a variation of the Generalised Pareto distribution with co-variates is applied jointly on the dataset, instead of conducting sub-sample analysis, eg on specific sample periods or by occupancy type.

The third part of the analysis focuses on hypothetical scenarios where an insurance company considers expanding in the LCR insurance business in the APAC region. Specifically the impact of including business from specific occupancy types (as an example) onto a well-diversified

insurance portfolio is examined.

### LCR losses from manufacturing lines have thicker tails

The project's major results are that LCR losses arising from manufacturing lines have thicker tails than commercial lines. In addition it is observed that increasing business in developed (vs developing) regions is followed by an increase in both average losses but also in tail thickness.

Moreover, focusing on developing regions, larger variation in claims is observed, possibly arising from the higher degree in variability in the exposures in developing regions compared to more homogeneous exposures in developed regions.

Finally, given the floods in Thailand in 2011 (which coincided with the post-2008 crisis in western countries), we conduct an exploratory analysis to identify any structural breaks in insurance business, in the period before and after this date.

The analysis (tail regressions conditional on covariates including controlling for the two time-periods) shows that in developing regions, the average LCR loss has dropped in the post-2011 (and also post-2008) period.

Interested readers may find the extensive research report useful (freely available from www.irfrc.com).

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