Modeling Flood Insurance Penetration in the European Non-Life Market: An Overview

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Non-life property insurance plays a significant role in assessing and managing economic risk. Understanding the exposure, or property at risk, helps insurers and reinsurers to better categorize and manage their portfolios. However, the nature of the flood peril, in particular adverse selection, has led to a complex system of different insurance covers and policies across Europe owing to its public and private distinctions based on premiums provided as ex ante or ex post, socio-economic characterization and various compensation schemes. To model this significant level of complexity within the European flood insurance market requires not only extensive data research, close understanding of insurance companies and associations as well as historic flood events, but also careful evaluation of the flood hazard in terms of return periods and flood extents, and the economic/ financial background of the geographies involved.

This abstract explores different approaches for modeling the flood insurance penetration rates in Europe depending on the information available and complexity involved. For countries which have either a regulated market with mandatory or high penetration rate, as for example found in the UK, France and Switzerland, or indeed countries with negligible insurance cover such as Luxembourg, assumptions about the penetration rates can be made at country level. However, in countries with a private insurance market, the picture becomes inherently more complex. For example in both Austria and Germany, flood insurance is generally restricted, associated with high costs to the insured or not available at all in high risk areas. In order to better manage flood risk, the Austria and German government agencies produced the risk classification systems HORA and ZÜRS, respectively, which categorize risk into four risk zones based on the exceedance probability of a flood occurrence. Except for regions that have preserved mandatory flood inclusion from past policies, insurance cover is generally limited or not available in high risk zones due to high risk proximity. To estimate this relationship, flood extent maps, modeled return periods, socio- economic indicators and the spatial distribution of insured portfolios can be used to quantify the economic to insured exposure ratio.

Adequately modeling these insurance conditions not only allows developing an industry view of the exposed property and values at risk from flood but also improves loss assessments. From an insurance perspective, such a model is beneficial for assessing insurance cover related to flood damage – especially due to differences in policies in high-exposure zones – the role of governments, and to assist insurers and reinsurers to make informed decision in allocating their portfolios.