



## **Application of an empirical model for the estimation of flood losses in the business sector**

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The estimation of potential economic losses is an important part of the planning process for flood mitigation measures. In past events high damages in the industrial and commercial sector contributed a considerable part to the total losses. Hence, loss models for the business sector, which link flood exposure data with information about the characteristics and assets of companies at risk, are fundamental for the reasonable planning of flood mitigation measures.

After the 2002 flood along the river Elbe and its tributaries, data from 415 flood-affected companies in Saxony, Germany, were collected via telephone-surveys. Based on this dataset an empirical loss model was developed. It distinguishes between loss to buildings and loss to equipment and inventory. Four business lines as well as three company sizes (given in number of employees) are differentiated. Water depth was identified as the most important flood impact parameter. Factors, which can be additionally included in the model, are contamination of the flood water and applied precautionary measures. For instance, for small companies (with less than ten employees) from the production industry, trade and services, loss ratios for buildings are estimated to be 8-10% given a water depth up to 20cm, whereas in finance industry 14% are estimated. The occurrence of heavy contamination without any precautionary measures can increase these ratios by up to 11%. No contamination and good precaution result in a reduction by up to 20%.

As the model works with loss ratios, a database with the asset values for business buildings as well as for equipment and inventory is necessary to derive the absolute loss. Macroeconomic data in combination with geodata and spatial data were used to create such a business-value-database for Germany. Adapted to the use with the

model, the asset values in the database are distinguishable for different business lines and sizes of company.

In this contribution the model applications to the cities of Döbeln, Flöha and Eilenburg in Saxony are presented. To check the performance of the model and of the business-value-database, the results are compared with damage records of the flood in 2002 from SAB, Saxony's bank for reconstruction.