

ABSTRACT

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The dissertation is devoted to research of the impact of catastrophic risk on systemic risk (SR) in the insurance sector. Referring to the existing state of knowledge, the main objective of the dissertation is:

- i. to investigate the relationship between catastrophic events and systemic risk,
- ii. to empirically verify whether catastrophic events can be counted as triggering events for systemic risk in the insurance sector,
- iii. to examine the role of reinsurance in mitigating the effects of catastrophic events and reducing the impact of such events on SR.

To realize the main objective, it is decomposed into 12 specific objectives, with reference to which the following main hypothesis is formulated: *The occurrence of a catastrophic event increases the systemic risk in the insurance sector and cause a rise in the strength of the linkages between the entities of the sector, leading to a contagion effect.*

The objectives of the dissertation are pursued by means of an elaborated multi-stage research procedure, in which, based on the rates of return for 36 companies – insurers and reinsurers – the change is analyzed of the values of systemic risk measures (Δ CoVaR and MES) and the values of topological network indices (characterizing the structure of insurance sector institutions' links) under the influence of a catastrophic event. The possibility of using reinsurance to mitigate the impact of a catastrophe on the insurance sector's systemic risk is also tested.

The results of the study indicate that the impact of a catastrophic event on systemic risk depends primarily on the market conditions during which the event occurs. The contribution of insurance and reinsurance companies to the creation of systemic risk increases significantly during the European immigration crisis and the war in Ukraine. The exposure of insurance and reinsurance companies to systemic risk increases significantly primarily during the war in Ukraine, and the exposure of the insurance sector as a whole increases significantly for Europe during the European immigration crisis and the war in Ukraine, for Asia during the European sovereign debt crisis and the European immigration crisis and in normal state, and for America during the European immigration crisis.

It is found that in the days following a catastrophic event, the structure of connections within the insurance sector changes. It features a stronger tendency to create hubs, i.e. structures in

which a company with many connections merges with companies with few connections, facilitating the spread of shocks within the sector. Closer ties between the sector's institutions are also observed.

Finally, dependencies between pairs of continents are found, particularly between Europe and the Americas, which limits the ability to use reinsurance to mitigate the impact of catastrophe occurrence on systemic risk.