

## Assegno di Ricerca

# The Economics of Cyber Risk Insurance

### ABSTRACT

The research assistantship is included in the activity of the PNRR plan PE07, Spoke 8: "Risk Management for Future Cyber-Physical Ecosystems". In particular, the research assistant will contribute to WP1 of the project, devoted to: "Continuous Risk Management Indicators and Models". The goal of the project is to contribute to the literature on the exposure to and insurance cost of cyber risk. The expected outcome will consist of:

- 1) a technical document of review of the theoretical and empirical issues involved in the risk measurement and management of cyber risk
- 2) two research papers exploring the nature and impact of cyber risk with particular focus on the contagion and systemic features.

The project will develop along parallel theoretical and empirical lines. More specifically,

- 1) the theoretical part will consist of
  - a. the economics of cyber risk: starting from the standard Gordon-Loeb model the project will explore the relevance of introducing dependence between the probabilities of cyber attacks
  - b. the statistics of cyber risk: the project will study the tail behaviour of losses brought about by cyber risk with the task of addressing the question of insurance and re-insurance of cyber risk
- 2) the empirical part will consist of
  - a. projecting and realizing a measure of cyber risk resorting to techniques similar to those used for climate change and geopolitical risks.
  - b. projecting and realizing a measure of the exposure of specific firms to cyber risk, using both standard equity risk premium analysis and the implied information included in derivatives. This task will be conditioned by the availability of data on cyber risk attacks.

### ACTIVITY PLAN

The activity plan will consist of:

- 1) Review of literature and writing of the Technical Document (1 month)
- 2) Paper on systemic and contagion effects of credit risk (2 months)
- 3) Paper on the statistical features of cyber risk losses distribution (2 months)
- 4) Measure of cyber risk and impact on firms (7 months)

Apart from activity 1), that will be addressed first for obvious reasons, the sequence of the activities and the percentage of time devoted to each may change depending on many factors. A crucial one is the availability of data. Other factors may be due to issues that may arise during the work, such as for example the delay in the availability of data on losses specific to firms that may advise to address the analysis of the statistical features of losses at the end of the project. From this viewpoint, an important fall-out of the process will be to make a state of the art assessment of the gap between the data needed for a satisfactory measurement system of the intensity and severity of cyber risk in Europe and the data currently available or scheduled to be available in the nearest future.