

## Foreword

Looking back in history, we conceive the twentieth century as the century of wars. Most likely, we will conceive the twenty-first century as the century of (natural) catastrophes.

Wars can be avoided (unfortunately, it did not happen often in history), in contrast, most natural disasters are outside human influence. However, the consequences of disasters can be alleviated by means of risk management. For an effective risk management, information is needed about (i) the size of the risk (measured by the frequency and intensity of the hazard), and (ii) the degree of vulnerability of the economy and society. Stefan Hochrainer's thesis deals with measuring and modeling of both. While the physical risk modeling is a well developed area within statistical modeling (frequency analysis, point processes, extreme value theory, etc.), estimating the economic consequences is a more challenging task. The author studies economic effects of catastrophes by statistical analysis of macro-economic data. One interesting finding is that disasters can decrease the absolute level of economic performance, such as the GDP, while keeping growth levels nearly the same (at least after some years) as in the pre-disaster years.

The boom of new products in the financial markets, especially of new derivative instruments, has led to new risk hedging instruments such as catastrophe bonds. CAT-bonds transfer the risk to the market of investors. In this volume, such instruments as well as insurance and credit arrangements are compared within the decision problem of optimally using limited funds. For this purpose, the software tool CATSIM was developed, which determines the effectiveness of proactive risk management instruments for the long-term economic development of a country by simulation.

It is hoped that this book will contribute to its goal: To create more stable and robust economic conditions and to avoid disruptions and stress on our planet, especially in view of the fact that this planet will be even more exposed to natural hazard events in the near future.

o. Prof. Dr. Georg Pflug