Collaborative Research Center 649

Economic Risk

Contents

Sonderforschungsbereich 649 "Ökonomisches Risiko"
Collaborative Research Center 649 on Economic Risk

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Greeting

from the Governing Mayor of Berlin, Klaus Wowereit

Economic activity is often associated with risk. This is not necessarily bad. Indeed, a lack of risks implies a lack of opportunities. And only those who actively seize opportunities - and thereby consciously engage in risky behavior - can be successful in our market economy.

However, there are some risks that are difficult to assess and that may have a lasting negative impact on our economy. These are for example risks associated with the business cycle and with unemployment. Minimizing such risks is one of the most important challenges of our times.

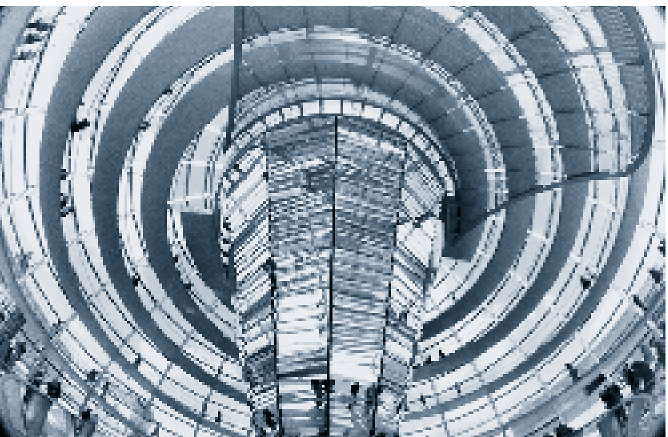
Therfore, we are pleased to see that the German Research Foundation has authorized a new Collaborative Research Center on Economic Risk in Berlin.

Researchers from the Humboldt-Universität zu Berlin, the Free University Berlin, the Technical University Berlin, the University of Potsdam, the Weierstraß Institute and the German Institute for Economic Research will join forces to investigate the causes and effects of economic risks and to develop methods for managing these risks successfully.

And there is one thing we already know: The decision of the German Research Foundation to authorize this Center is not a case of economic risk. Instead, it is a recognition of Berlin as a home of scientific excellence.

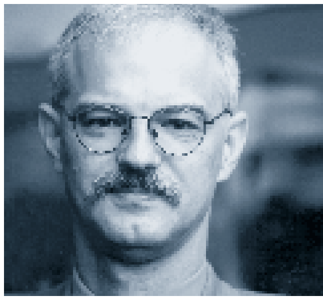
We eagerly await the results of this research endeavor.

Klaus Wowereit



Greeting

from the Vice-President for Research at the Humboldt-Universität zu Berlin, Prof. Dr. Hans Jürgen Prömel



One can recognize a good university through its excellence in research and its ability to impart the spirit of research in its teaching. And one often recognizes excellent research by its ability to obtain external funding. Hence, the German Research Foundation's authorization of the Collaborative Research Center on Economic Risk once again confirms the high quality of economic research conducted at the Humboldt-Universität zu Berlin and its collaborating institutions.

Economic policy can greatly influence the standard of living in a country. It is therefore essential to conduct economic research employing the most advanced methods and to grant public access to the scientific results obtained.

The Collaborative Research Center on Economic Risk fulfills two recommendations of the German Science Council regarding the strengthening of economic research at German universities. First, the Center focuses upon an important current topic in Economics. Second, it contributes to the improvement of empirical economic research in Germany.

I wish the Collaborative Research Center on Economic Risk much success.

Prömel

Prof. Dr. Hans Jürgen Prömel

Economic Risk

Prof. Wolfgang Härdle (head of project B1 and deputy coordinator of SFB 649) with **Prof. Harald Uhlig** (head of project C1 and coordinator of SFB 649)

"Le risque est l'onde de proue du succès." (Carl Amery)

Persistently high unemployment and increasing global economic integration require changes in social security systems. Financial market fluctuations threaten household wealth. Unforeseen technical innovations destroy the market position of well-established firms.

These uncertainties exemplify a phenomenon known as economic risk. We will investigate this topic within the Collaborative Research Center 649, which has been established by the German Research Foundation and which is part of the interdisciplinary Center for Applied Statistics and Economics (CASE) at the Humboldt-Universität zu Berlin. Participating economists, mathematicians and statisticians come from the Humboldt-Universität zu Berlin as well as the Free University Berlin, the Technical University Berlin, the University of Potsdam, the Weierstraß Institute for Applied Analysis and Stochastics (WIAS) and the German Institute for Economic Research (DIW). Excellent graduate students actively participate in the research done within the Collaborative Research Center 649, thereby obtaining cutting edge training and education.

The researchers employ empirical as well as quantitative-theoretical methods. They are supported by an innovative Financial and Economic Data Center. We also aim to provide external researchers with access to the data, algorithms and results. The Collaborative Research Center 649 encourages the visits of guest researchers.

The results of the research should improve the decision-making capabilities of both public and private institutions. Economic risks shall be reduced and economic opportunities shall be better exploited.

This brochure serves as a guide to our projects. We hope you gain many new and useful insights.

Harald Uhlig

Prof. Harald Uhlig, Ph.D. (coordinator)

W. Härdle

Prof. Dr. Wolfgang Härdle (deputy coordinator)

Collaborative Research Center on Economic Risk – Objectives

Improving the economic prospects of people, firms or entire nations requires a precise understanding of economic risks. Therefore, the Collaborative Research Center on Economic Risk seeks answers to the following questions.

Prof. Ernst Maug
(head of project A1 and B4)

Research Questions

What are the main economic risks and what are their consequences? Which risks affect individual households and firms? Which risks affect the economy as a whole? Which risks specifically affect financial markets?

Examples: How does demand uncertainty influence a firm's investment and price setting decisions? How does the risk of unemployment affect an individual's decision whether to obtain certain qualifications? What causes business cycles? How do business cycles affect households and firms? How do business cycles influence financial markets?

Prof. Michael Burda
(head of project C7)

What should be done about these risks?
How should risks be allocated and managed?

Examples: How can households and firms insure themselves against risks? What role do financial markets play in the allocation of risk? Who ultimately bears risk? Does monetary or fiscal policy influence business cycles? What is optimal monetary and fiscal policy?

Are risks insurable?
What are the limits to insurability?

Examples: Which individual risks can be insured on markets? Global risks, e.g. risks associated with international business cycles, are not insurable for the economy as a whole. How should one deal with these uninsurable risks?

Prof. Dorothea Kübler
(head of project A6)

Project Groups

We will research these questions within three project groups and a data center.

Researchers in Project Group A focus on the microeconomic and decision-theoretic dimensions of risk. They investigate how individuals perceive certain risks. Moreover, they study how risks influence individual decisions and optimal contracts.

Prof. Axel Werwatz
(head of project B3)

Researchers in Project Group B conduct quantitative research on financial markets and risk valuation. Financial markets are prime examples of markets where risk is priced and allocated. The aim here is to develop new statistical methods to analyze risk valuation and to apply these new methods to a series of important financial markets.

In Project Group C, researchers focus on macroeconomic risks. Such risks cannot simply be "diversified away," but rather must be managed in other ways, for example, through monetary or fiscal policy.

The Financial and Economic Data Center supports the empirical and quantitative-theoretical research of the Collaborative Research Center 649. The Data Center offers all participating researchers a variety of resources such as data sets, software and numerical algorithms. Moreover, the Data Center serves as a portal for the publication of research results.

Juniorprof. Bartosz Maćkowiak
(head of project C3)

Research and Education

Beyond seeking answers to the aforementioned questions, the Collaborative Research Center on Economic Risk pursues two other goals.

First, the Center aims to improve the quality of economic research in Germany. A recent international comparison of economics departments commissioned by the European Economic Association (EEA) named only two German departments among the 100 worldwide leading institutions (Kalaitzidakis et al., JEEA, 2003, 1346–1366). In comparison to the United States, Germany has fallen behind. The Collaborative Research Center on Economic Risk aims to narrow this gap.

Second, the Center intends to increase the international competitiveness of economists trained in Germany. Few German-trained economists work in international organizations such as the International Monetary Fund (IMF), the Organization for Economic Cooperation and Development (OECD) or the World Bank. The Collaborative Research Center on Economic Risk aims to correct this discrepancy by providing high-quality training to young researchers.

Relaxing between lectures in Motzen

Dr. Ingolf Dittmann (head of project B4), **Dr. Carsten Trenkler** (head of project C2) and **Dr. Ralf Brüggemann** (head of project C2)

Worldwide Transdisciplinary Cooperation

The Collaborative Research Center on Economic Risk is a center of transdisciplinary research where insights from Economics, Mathematics and Statistics are merged. The exchange of information occurs via the daily cooperation among researchers from different research groups and is further enhanced through periodic "jours fixes" and internal workshops.

The Collaborative Research Center 649 seeks an intellectual exchange with researchers from all around the world. Seminars given by external researchers play an especially important role. The key seminar series are the "Schumpeter Seminar," the "Quantitative Finance Seminar," and the "Mathematical Statistics Seminar." Special lecture series, such as the "Schumpeter Lecture Series" and the "Hermann Otto Hirschfeld Lectures" will be offered in addition to these seminars.

Further information: **http://sfb649.wiwi.hu-berlin.de**

Dr. Carsten Trenkler
(head of project C2),
Prof. Ernst Maug
(head of project A1 and B4) and
Prof. Albrecht Ritschl
(head of project C5)

Prof. Jordi Galí
(Universitat Pompeu Fabra),
Prof. Boyan Jovanovic
(New York University),
Prof. Martin Eichenbaum
(Northwestern University),
Prof. Robert Hall
(Stanford University) and
Prof. Harald Uhlig
(Humboldt-Universität zu Berlin,
coordinator of SFB 649)

The Financial and Economic Data Center (FEDC)

The Financial and Economic Data Center supports the empirical research and the computer-aided quantitative-theoretical research of the Collaborative Research Center 649. The functions of the FEDC span four areas.

The FEDC is responsible for the **central acquisition and administration of data**. The economic research conducted by the Collaborative Research Center on Economic Risk is largely empirical. Therefore there is a great need for data. Centralizing both data acquisition and data administration reduces costs. For example, the ExecuComp data base contains data on managerial compensation, which is necessary for several projects of project group A. Datastream and EcoWin are commercial data bases for macroeconomic and financial market data, which are integral to various projects of project groups B and C. The central administration of data also makes it possible to grant guest researchers and students access to the data.

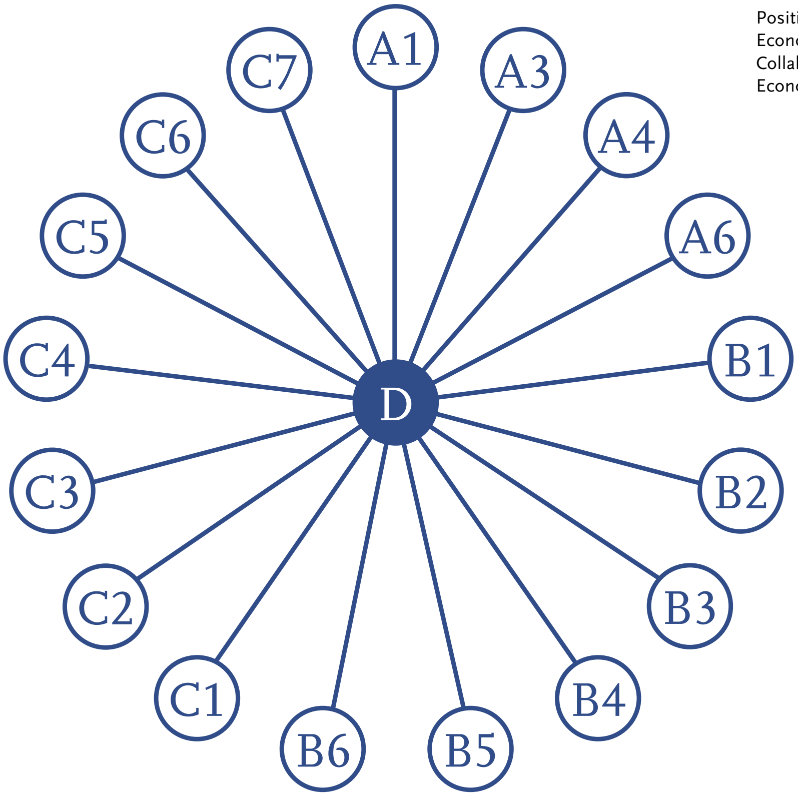
The FEDC offers all projects **central computing capacity**. Many projects of the Collaborative Research Center 649 require the execution of complex calculations. A central hardware platform provides the appropriate computing power.

The FEDC is also responsible for the **central acquisition and administration of software**. The researchers will analyze extensive financial and economic data and will solve theoretical models with modern numerical methods. Thus they need scientific software such as MATLAB. Central procurement and administration of this type of software allows the Collaborative Research Center 649 to further reduce its costs.

Finally, the FEDC serves as a **portal**. Researchers make their results available to the public in the form of discussion papers (ISSN 1860–5664). Furthermore, the FEDC provides external researchers with access to the methods and algorithms developed within the Collaborative Research Center 649. Moreover, several research groups themselves generate new or enhanced data in their research, which can serve as intermediate and interesting input to others. Examples include information on country-specific risk premia, implied volatility surfaces, or experimental data. External researchers have access to this enhanced data through the FEDC.

The Collaborative Research Center on Economic Risk encourages the visits of guest researchers who wish to conduct empirical or theoretical research on economic risk at the Humboldt-Universität zu Berlin. Interested researchers are asked to send their curriculum vitae along with a short description of their project via email to the office of the Collaborative Research Center 649 (**sfb@wiwi.hu-berlin.de**). Within its capacity constraints, the Center will provide guest researchers access to the Center's resources. Guest researchers themselves are expected to cover their travel and accommodation costs.

Further information: **http://sfb649.wiwi.hu-berlin.de/fedc**



Position of the Financial and Economic Data Center within the Collaborative Research Center on Economic Risk

Prof. Harald Uhlig (head of project C1 and coordinator of SFB 649) gives an introduction to the EcoWin data base

The Projects

Project Group A: Individual and Contractual Responses to Risk

A1: Risk and the design of executive compensation contracts (Prof. Ernst Maug, Ph.D.)
The objective of this project is to develop and test a model that can explain the structure of executive compensation contracts. Researchers take into account that contracts can be renegotiated.

A3: Optimization of dynamic consumption streams under uncertainty (Prof. Dr. Alexander Schied)
Classical financial mathematics uses stochastic models to specify the evolution of future market prices, but in practice even the choice of the model is subject to uncertainty. The aim of this project is to investigate the impact of this model uncertainty on the problem of determining optimal consumption and investment plans.

A4: Optimal allocation of risk in organizations (Prof. Dominique Demougin, Ph.D.)
Researchers analyze incentive schemes and allocation of risk in organizations, paying special attention to the incentives created by reputation mechanisms.

A6: Strategic risk in experimental games (Prof. Dr. Dorothea Kübler)
The research group studies the factors determining strategic uncertainty in experimental games. In order to measure strategic uncertainty, participants are asked about their beliefs regarding other participants' behavior.

Project Group B: Financial Markets and Risk Valuation

B1: Dynamic semiparametric modelling (Prof. Dr. Wolfgang Härdle)
The focus of this project is the dynamic semiparametric modelling of risk factors. Researchers develop and apply statistical theory in this area.

B2: Valuation of brands and branding strategies (Prof. Dr. Lutz Hildebrandt)
This project is concerned with brand management. The research team aims to estimate the effect of different brand strategies on brand value and firm value.

B3: Real estate valuation and investment (Prof. Dr. Franz Hubert, Prof. Axel Werwatz, Ph.D.)
Researchers study household investment in real estate and the related risks. Researchers pay special attention to real estate valuation.

B4: Measuring firm value and risk premia (Dr. Ingolf Dittmann, Prof. Ernst Maug, Ph.D.)
Using an extensive data base with market and balance sheet data, researchers study firm valuation models that can be used to estimate risk premia and costs of capital on a factor basis.

B5: Structure adaptive data analysis (Prof. Dr. Vladimir Spokoiny)
Researchers aim to develop structure adaptive methods for different problems in statistical data analysis and to apply these methods to risk management.

B6: Stochastic analysis of financial markets with heterogeneous information (Prof. Dr. Peter Imkeller)
Researchers model financial markets where agents with different levels of information interact with each other.

Project Group C: Macroeconomic Risks

C1: Macroeconomic risks: factors, the role of capital markets and implications for economic policy (Prof. Harald Uhlig, Ph.D.)
This research group investigates the causes of macroeconomic risks and the management of these risks through monetary and fiscal policy. Researchers develop and apply new methods in time series analysis and quantitative-theoretical analysis.

C2: Unit root and cointegration methods (Dr. Ralf Brüggemann, Dr. Carsten Trenkler)
Researchers empirically analyze macroeconomic risks using multivariate time series analysis with the aim of further developing these techniques.

C3: International macroeconomic risk, its sources and how policy can manage it (Juniorprof. Bartosz Maćkowiak, Ph.D.)
Researchers analyze the causes of international business cycles using Bayesian time series analysis. Moreover, researchers analyze rational inattention and its macroeconomic consequences.

C4: Stochastic optimization for economic models under consideration of time lag effects (Dr. Markus Reiß)
The research team analyzes time lag effects in economies with uncertainty. The aim is to derive optimal policy rules.

C5: Macroeconomic risk from a long-run perspective (Prof. Dr. Albrecht Ritschl)
This group studies macroeconomic risk and its determinants from an historical perspective. It also analyzes the international spread of macroeconomic risk during the history of globalization.

C6: Quantitative analysis of monetary policy in the enlarged European Union (Dr. Imke Brüggemann)
This project analyzes macroeconomic risks associated with the enlargement of the European Monetary Union. Structural models will be used and evaluated empirically.

C7: Employment risk: human capital, wages and unemployment (Prof. Michael C. Burda, Ph.D.)
This project investigates the role played by risk for the process of human capital formation. The theoretical findings will be evaluated empirically using both micro and macroeconomic data sets.

Further information:
http://sfb649.wiwi.hu-berlin.de/projects

Activities and Discussion Papers

Prof. Jordi Galí
(Universitat Pompeu Fabra)
during the Schumpeter
Lecture Series July 2004

The Collaborative Research Center 649 is intended as a forum for frontier research. To this end, the Center organizes seminars and conferences and publishes its results as discussion papers.

1 Seminars

Guests of the Collaborative Research Center 649 present their work in one of three seminar series. The “Schumpeter Seminar” is intended as a forum for the newest results in macroeconomics and related fields. Recent guests to the “Schumpeter Seminar” include Jordi Galí (Pompeu Fabra), Jörn-Steffen Pischke (London School of Economics), José Víctor Ríos Rull (University of Pennsylvania) and Michael Woodford (Columbia). The “Quantitative Finance Seminar” emphasizes financial markets. The “Mathematical Statistics Seminar” focuses on methods. In addition, there are three lecture series: the “Schumpeter Lecture Series,” the “CASE Distinguished Lecture Series” and the “Hermann Otto Hirschfeld Lectures.” The “Hermann Otto Hirschfeld Lectures” were held in 2003 by Joel Horowitz (Northwestern) and in 2004 by Paul Embrechts (ETH Zürich). In 2005 and 2006, Francis Diebold (University of Pennsylvania) and Stephen Stigler (University of Chicago) are expected to hold this lecture.

Nobel prize winner
Prof. Edward Prescott
(Arizona State University)
during his talk in Berlin June 2003

2 Conferences

A conference on economic risk is planned each year. This year’s conference is co-organized by Professor Harald Uhlig and the Deutsche Bundesbank and is entitled “Macroeconomic Risk and Policy Responses”. The conference will take place in Berlin on the 27th and 28th of May 2005. Among the expected lecturers are John Campbell (Harvard), Lawrence Christiano (Northwestern), Lars Hansen (University of Chicago), Narayana Kocherlakota (Stanford), Christopher Sims (Princeton) and Lars Svensson (Princeton).

3 “Jours Fixes” and Internal Workshops

The scientific exchange within the Collaborative Research Center 649 is enhanced by regularly scheduled “jours fixes” and internal workshops. The “jours fixes” are meetings during which Center researchers present their results to colleagues from other projects. As part of the internal workshops, researchers from different projects form groups to enhance the pursuit of collaborative work.

4 Discussion Papers

The Collaborative Research Center 649 publishes its research results in the form of discussion papers (ISSN 1860-5664) on the internet (**http://sfb649.wiwi.hu-berlin.de/fedc**). When possible, the methods and data used in the paper are also made available. The aim here is to achieve the maximum level of transparency possible.

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