M. Eric Johnson

# Managing Information Risk and the Economics of Security

Springer

# Managing Information Risk and the Economics of Security

# Managing Information Risk and the Economics of Security

*Edited by*

M. Eric Johnson
*Center for Digital Strategies*
*Tuck School of Business at Dartmouth*
*Hanover, NH, USA*

Springer

*Editor*
Dr. M. Eric Johnson
Tuck School of Business Administration
Dartmouth College
Hanover, NH 03755, USA
M.Eric.Johnson@tuck.dartmouth.edu

ISBN: 978-0-387-09761-9 e-ISBN: 978-0-387-09762-6

Library of Congress Control Number: 2008936480



Printed on acid-free paper

springer.com

# List of Contributors

Managing Information Risk and Economics of Security
*M. Eric Johnson, Tuck School of Business at Dartmouth*

Nonbanks and Risk in Retail Payments
*Terri Bradford, Federal Reserve Bank-Kansas City*
*Fumiko Hayashi, Federal Reserve Bank-Kansas City*
*Christian Hung, Federal Reserve Bank-Kansas City*
*Stuart Weiner, Federal Reserve Bank-Kansas City*
*Zhu Wang, Federal Reserve Bank-Kansas City*
*Richard Sullivan, Federal Reserve Bank-Kansas City*
*Simonetta Rosati, European Central Bank*

Security Economics and European Policy
*Ross Anderson, University of Cambridge*
*Rainer Boehme, Dresden University of Technology*
*Richard Clayton, University of Cambridge*
*Tyler Moore, University of Cambridge*

BORIS – Business-Oriented Management of Information Security
*Sebastian Sowa, Ruhr-University of Bochum*
*Lampros Tsinas, Munich Re*
*Roland Gabriel, Ruhr-University of Bochum*

Productivity Space of Information Security in an Extension of the Gordon-Loeb's Investment Model
*Kanta Matsuura, University of Tokyo*

Communicating the Economic Value of Security Investments; Value at Security Risk
*Rolf Hulthén, TeliaSonera AB*

Modelling the Human and Technological Costs and Benefits of USB Memory Stick Security
*Adam Beautement, UCL*
*Robert Coles, Merrill Lynch*
*Jonathan Griffin, HP Labs*
*Christos Ioannidis, University of Bath*
*Brian Monahan, HP Labs*
*David Pym, HP Labs and University of Bath*
*Angela Sasse, UCL*
*Mike Wonham, HP Labs*

# Preface

Security has been a human concern since the dawn of time. With the rise of the digital society, information security has rapidly grown to an area of serious study and ongoing research. While much research has focused on the technical aspects of computer security, far less attention has been given to the management issues of information risk and the economic concerns facing firms and nations. *Managing Information Risk and the Economics of Security* provides leading edge thinking on the security issues facing managers, policy makers, and individuals. Many of the chapters of this volume were presented and debated at the 2008 Workshop on the Economics of Information Security (WEIS), hosted by the Tuck School of Business at Dartmouth College. Sponsored by Tuck's Center for Digital Strategies and the Institute for Information Infrastructure Protection (I3P), the conference brought together over one hundred information security experts, researchers, academics, reporters, corporate executives, government officials, cyber crime investigators and prosecutors. The group represented the global nature of information security with participants from China, Italy, Germany, Canada, Australia, Denmark, Japan, Sweden, Switzerland, the United Kingdom and the US.

This volume would not be possible without the dedicated work Xia Zhao (of Dartmouth College and now the University of North Carolina, Greensboro) who acted as the technical editor. I am also grateful for the service of the WEIS program committee: Alessandro Acquisti (Carnegie Mellon University), Ross Anderson (Cambridge University), Jean Camp (Indiana University), Huseyin Cavusoglu (University of Texas, Dallas), Ramnath Chellappa (Emory University), Neil Gandal (Tel Aviv University), Anindya Ghose (New York University), Eric Goetz (Dartmouth College), Larry Gordon (University of Maryland), Karthik Kannan (Purdue University), Marty Loeb (University of Maryland), Tyler Moore (Cambridge University), Andrew Odlyzko (University of Minnesota), Brent Rowe (RTI), Stuart Schechter (Microsoft), Bruce Schneier (BT Counterpane), Sean Smith (Dartmouth College), Rahul Telang (Carnegie Mellon University), Catherine Tucker (MIT), and Hal Varian (University of California, Berkeley).

Many thanks also go to the individuals and the organizations that helped us organize WEIS: Hans Brechbühl, Jennifer Childs, Scott Dynes, Eric Goetz, David Kotz, Xia Zhao (all of Dartmouth), and Stuart Schechter (Microsoft), as well as the support of Tuck School of Business and Thayer School of Engineering at Dartmouth College; the Institute for Information Infrastructure Protection (I3P); the Institute for Security Technology Studies; and Microsoft. WEIS and the efforts to compile this book were partially supported by the U.S. Department of Homeland Security under Grant Award Number 2006-CS-001-000001, under the auspices of the Institute for Information Infrastructure Protection (I3P) and through the Institute

for Security Technology Studies (ISTS). The I3P is managed by Dartmouth College. The views and conclusions contained in this book are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Department of Homeland Security, the I3P, ISTS, or Dartmouth College.

September 2008 M. Eric Johnson

# Table of Contents