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Managing Uncertainty, Mitigating Risk proposes that financial risk management broaden its approach, maintaining quantification where possible, but incorporating uncertainty. The author shows that by using broad quantification techniques, and using reason as the guiding principle, practitioners can see a more holistic and complete picture.

Understanding and managing risk and uncertainty is a central task in contemporary societies characterised by rapid social, technological and environmental change. This book presents research approaches used by scholars who all share a passion to gain new insights in how individuals, organisations and societies approach uncertain futures and their potential dangers. The contributions illustrate the usefulness of particular methods and methodologies for researching risk in order to advance the understanding and management of social, technological and environmental challenges. With research strategies and approaches from sociology, psychology, history, linguistics, anthropology, and gender studies, *Researching Risk and Uncertainty* provides guidance and inspiration to students and scholars across a range of disciplines interested in risk, disaster and social crisis.

The book analyzes, compares, and contrasts tools and techniques used in risk management at corporate, strategic business and project level and develops a risk management mechanism for the sequencing of risk assessment through corporate, strategic and project stages of an investment in order to meet the requirements of the 1999 Turnbull report. By classifying and categorizing risk within these levels it is possible to drill down and roll-up to any level of the organizational structure and to establish the risks that each project is most sensitive to, so that appropriate risk response strategies may be implemented to benefit all stakeholders. "The new edition of this book provides a clear insight into the intricacies of corporate risk manage-

ment and the addition of the case study exemplars aids understanding of the management of multiple projects in the real world." —Professor Nigel Smith, Head of the School of Civil Engineering, University of Leeds

The compilation of ground-breaking papers contained in this collection offers a complete description of the evolution of knowledge in the economics of risk and time, from its early twentieth-century explorations to its current diversity of approaches. The papers focus first on the basic decisions under uncertainty, and then on asset pricing. They cover both classical expected utility approach and its non-expected utility generalizations, with applications to dynamic portfolio choices, insurance, risk sharing, and risk prevention. Prefaced by an original introduction from the editor, this collection will be valuable for scholars in finance and macroeconomics, particularly those with an interest in the modeling foundations of consumer and investor decisions under uncertainty.

Everyday we face decisions that carry an element of risk and uncertainty. The ability to analyse, communicate and control the level of risk entailed by these decisions remains one of the most pressing challenges to the analyst, scientist and manager. This book presents the foundational issues in risk analysis ? expressing risk, understanding what risk means, building risk models, addressing uncertainty, and applying probability models to real problems. The principal aim of the book is to give the reader the knowledge and basic thinking they require to approach risk and uncertainty to support decision making. Presents a statistical framework for dealing with risk and uncertainty. Includes detailed coverage of building and applying risk models and methods. Offers new perspectives on risk, risk assessment and the use of parametric probability models. Highlights a number of applications from business and industry. Adopts a conceptual approach based on elementary probability calculus and statistical theory. Foundations of Risk Analysis

provides a framework for understanding, conducting and using risk analysis suitable for advanced undergraduates, graduates, analysts and researchers from statistics, engineering, finance, medicine and the physical sciences, as well as for managers facing decision making problems involving risk and uncertainty.

The need to understand the theories and applications of economic and finance risk has been clear to everyone since the financial crisis, and this collection of original essays proffers broad, high-level explanations of risk and uncertainty. The economics of risk and uncertainty is unlike most branches of economics in spanning from the individual decision-maker to the market (and indeed, social decisions), and ranging from purely theoretical analysis through individual experimentation, empirical analysis, and applied and policy decisions. It also has close and sometimes conflicting relationships with theoretical and applied statistics, and psychology. The aim of this volume is to provide an overview of diverse aspects of this field, ranging from classical and foundational work through current developments. Presents coherent summaries of risk and uncertainty that inform major areas in economics and finance Divides coverage between theoretical, empirical, and experimental findings Makes the economics of risk and uncertainty accessible to scholars in fields outside economics

This volume is intended to stimulate a change in the practice of decision support, advocating an interdisciplinary approach centred on both social and natural sciences, both theory and practice. It addresses the issue of analysis and management of uncertainty and risk in decision support corresponding to the aims of Integrated Assessment. A pluralistic method is necessary to account for legitimate plural interpretations of uncertainty and multiple risk perceptions. A wide range of methods and tools is presented to contribute to adequate and effective pluralistic uncertainty management and risk analysis in decision support endeavours. Special attention is given

to the development of one such approach, the Pluralistic Framework for Integrated uncertainty Management and risk Analysis (PRIMA), of which the practical value is explored in the context of the Environmental Outlooks produced by the Dutch Institute for Public Health and Environment (RIVM). Audience: This book will be of interest to researchers and practitioners whose work involves decision support, uncertainty management, risk analysis, environmental planning, and Integrated Assessment.

This book adds to the resolution of two problems in finance and economics: i) what is macro-financial uncertainty? : How to measure it? How is it different from risk? How important is it for the financial markets? And ii) what sort of asymmetries underlie financial risk and uncertainty propagation across the global financial markets? That is, how risk and uncertainty change according to factors such as market states or market participants. In Chapter 2, which is entitled "Momentum Uncertainties", the relationship between macroeconomic uncertainty and the abnormal returns of a momentum trading strategy in the stock market is studied. We show that high levels of uncertainty in the economy impact negatively and significantly the returns of a portfolio of stocks that consist of buying past winners and selling past losers. High uncertainty reduces below zero the abnormal returns of momentum, extinguishes the Sharpe ratio of the momentum strategy, while increases the probability of momentum crashes both by increasing the skewness and the kurtosis of the momentum return distribution. Uncertainty acts as an economic regime that underlies abrupt changes over time of the returns generated by momentum strategies. In Chapter 3, "Measuring Uncertainty in the Stock Market", a new index for measuring stock market uncertainty on a daily basis is proposed. The index considers the inherent differentiation between uncertainty and the common variations between the series. The second contribution of chapter 3 is to show how this financial uncertainty index can also serve as an indicator of macroeconomic uncertainty. Finally, the dynamic relationship between uncertainty and the series of consumption, interest rates, production and stock market prices, among others, is analyzed. In chapter 4: "Uncertainty, Systemic Shocks and the Global Banking Sector: Has the Crisis Modified their Relationship?" we explore the stability of systemic risk and uncertainty propagation among financial institutions in the global economy, and show that it has remained stable over the last decade. Additionally, a new simple tool for measuring the resilience of financial institutions to th-

ese systemic shocks is provided. We examine the characteristics and stability of systemic risk and uncertainty, in relation to the dynamics of the banking sector stock returns. This sort of evidence is supportive of past claims, made in the field of macroeconomics, which hold that during the global financial crisis the financial system may have faced stronger versions of traditional shocks rather than a new type of shock. In chapter 5, "Currency downside risk, liquidity, and financial stability", downside risk propagation across global currency markets and the ways in which it is related to liquidity is analyzed. Two primary contributions to the literature follow. First, tail-spillovers between currencies in the global FX market are estimated. This index is easy to build and does not require intraday data, which constitutes an important advantage. Second, we show that turnover is related to risk spillovers in global currency markets. Chapter 6 is entitled "Spillovers from the United States to Latin American and G7 Stock Markets: A VAR-Quantile Analysis". This chapter contributes to the studies of contagion, market integration and cross-border spillovers during both regular and crisis episodes by carrying out a multivariate quantile analysis. It focuses on Latin American stock markets, which have been characterized by a highly positive dynamic in recent decades, in terms of market capitalization and liquidity ratios, after a far-reaching process of market liberalization and reforms to pension funds across the continent during the 80s and 90s. We document smaller dependences between the LA markets and the US market than those between the US and the developed economies, especially in the highest and lowest quantiles.

Risk, Uncertainty, and Profit is a groundbreaking work of economic theory, distinguishing between risk, which is by nature measurable and quantifiable, and uncertainty, which can be neither be measured nor quantified. We begin with an analysis of the functions of profit, risk and uncertainty in the economy. Frank H. Knight introduces his work with a discussion on profit and how there are conflicts about its nature between various economic theorists. As the title implies, the author's chief concern is the interplay between making a profit, incurring risk, and determining if there is uncertainty. Risks are different from uncertainty in that they can be measured and protected against. For example a location chosen for a factory or farm may have a measured risk of flooding in a given year. Businesses, insurers and investors alike can be made aware of this, and behave according to the quantified risk.

Risk as we now know it is a wholly new phenomenon, the by-product of our ever more complex and powerful technologies. In business, policy making, and in everyday life, it demands a new way of looking at technological and environmental uncertainty. In this definitive volume, four of the world's leading risk researchers present a fundamental critique of the prevailing approaches to understanding and managing risk - the 'rational actor paradigm'. They show how risk studies must incorporate the competing interests, values, and rationalities of those involved and find a balance of trust and acceptable risk. Their work points to a comprehensive and significant new theory of risk and uncertainty and of the decision making process they require. The implications for social, political, and environmental theory and practice are enormous. Winner of the 2000-2002 Outstanding Publication Award of the Section on Environment and Technology of the American Sociological Association

This is a major, and deeply thoughtful, contribution to understanding uncertainty and risk. Our world and its unprecedented challenges need such ways of thinking! Much more than a set of contributions from different disciplines, this book leads you to explore your own way of perceiving your own area of work. An outstanding contribution that will stay on my shelves for many years. Dr Neil T. M. Hamilton, Director, WWF International Arctic Programme This collection of essays provides a unique and fascinating overview of perspectives on uncertainty and risk across a wide variety of disciplines. It is a valuable and accessible sourcebook for specialists and laypeople alike. Professor Renate Schubert, Head of the Institute for Environmental Decisions and Chair of Economics at the Swiss Federal Institute of Technology This comprehensive collection of disciplinary perspectives on uncertainty is a definitive guide to contemporary insights into this Achilles heel of modernity and the endemic hubris of institutional science in its role as public authority. It gives firm foundations to the fundamental historic shift now underway in the world, towards normalizing acceptance of the immanent condition of ignorance and of its practical corollaries: contingency, uncontrol, and respect for difference. Brian Wynne, Professor of Science Studies, Lancaster University Bammer and Smithson have assembled a fascinating, important collection of papers on uncertainty and its management. The integrative nature of Uncertainty and Risk makes it a landmark in the intellectual history of this vital cross-disciplinary concept. George Cvetkovich, Director, Center for Cross-Cultural Research, Western Washington Uni-

versity Uncertainty governs our lives. From the unknowns of living with the risks of terrorism to developing policies on genetically modified foods, or disaster planning for catastrophic climate change, how we conceptualize, evaluate and cope with uncertainty drives our actions and deployment of resources, decisions and priorities. In this thorough and wide-ranging volume, theoretical perspectives are drawn from art history, complexity science, economics, futures, history, law, philosophy, physics, psychology, statistics and theology. On a practical level, uncertainty is examined in emergency management, intelligence, law enforcement, music, policy and politics. Key problems that are a subject of focus are environmental management, communicable diseases and illicit drugs. Opening and closing sections of the book provide major conceptual strands in uncertainty thinking and develop an integrated view of the nature of uncertainty, uncertainty as a motivating or de-motivating force, and strategies for coping and managing under uncertainty.

This work has been selected by scholars as being culturally important and is part of the knowledge base of civilization as we know it. This work is in the public domain in the United States of America, and possibly other nations. Within the United States, you may freely copy and distribute this work, as no entity (individual or corporate) has a copyright on the body of the work. Scholars believe, and we concur, that this work is important enough to be preserved, reproduced, and made generally available to the public. To ensure a quality reading experience, this work has been proofread and republished using a format that seamlessly blends the original graphical elements with text in an easy-to-read typeface. We appreciate your support of the preservation process, and thank you for being an important part of keeping this knowledge alive and relevant.

Risks and uncertainties?market, financial, operational, social, humanitarian, environmental, and institutional?are the inherent realities of the modern world. Stock market crashes, demonetization of currency, and climate change constitute just a few examples that can adversely impact financial institutions across the globe. To mitigate these risks and avoid a financial crisis, a better understanding of how the economy responds to uncertainties is needed. *Maintaining Financial Stability in Times of Risk and Uncertainty* is an essential reference source that discusses how risks and uncertainties affect the financial stability and security of individuals and institutions, as well as probable solutions to miti-

gate risk and achieve financial resilience under uncertainty. Featuring research on topics such as financial fraud, insurance ombudsman, and Knightian uncertainty, this book is developed for researchers, academicians, policymakers, students, and scholars.

International law is a system of rules and principles that regulates behaviour between international actors in the present, but is based on what is expected to happen in the future. This book explores how risk and uncertainty are imagined, articulated, and managed across the various fields of international law.

Law and Uncertainty: Risks and Legal Processes examines the role of the law and legal institutions in coping with the risks and uncertainties that pervade our lives. It examines key concerns, such as how issues relating to risks can be dealt with by means of legal processes, and how risks can be controlled through different legal formulations and techniques. The contents cover a wide range of risk issues as they arise in legal contexts, ranging from the problems of assessing risks within the criminal justice system to the difficulties that judges encounter in processing risk-laden issues through the courts. This study brings together papers delivered at the WG Hart Legal Workshop of 1995, held at the Institute for Advanced Legal Studies in London.

If the very thought of budgets pushes your sanity over the limit, then this practical, easy-to-use guide is just what you need. *Budgeting Basics and Beyond, Third Edition* equips you with an all-in-one resource guaranteed to make the budgeting process easier, less stressful, and more effective. Written by Jae Shim and Joel Siegel, the new edition covers Balanced Scorecard, budgeting for nonprofit organizations, business simulations for executive and management training, and much more!

Both risk and uncertainty are neo-liberal concepts, which can be viewed as complementary techniques for governing diverse aspects of life, rather than natural states of things. This new book examines the way these constructs govern the production of wealth through 'uncertain' speculation and 'calculable' investment formulae. The way in which risk and uncertainty govern the minimisation of harms through insurance and through the uncertain practices of 'reasonable foresight' is discussed, and O Malley looks at the way these same techniques were historically forged out of moral and social beliefs about how to govern properly. In addition, the book analyzes how, during this process, ideas such as

'contract' and distinctions between insurance and gambling were invented to order to 'properly' govern the risky and uncertain future.

They begin by studying various environmental issues such as climate change and biodiversity conservation to underline the importance of identifying different forms of uncertainty have on economic development and environmental policies, and study the attitudes of different user-groups to these issues. Finally, they examine the natural resource management dilemmas faced by the private sector including issues of optimal resource allocation, insurance problems and consumer behaviour.

A timeless classic of economic theory that remains fascinating and pertinent today, this is Frank Knight's famous explanation of why perfect competition cannot eliminate profits, the important differences between "risk" and "uncertainty," and the vital role of the entrepreneur in profitmaking. Based on Knight's PhD dissertation, this 1921 work, balancing theory with fact to come to stunning insights, is a distinct pleasure to read. FRANK H. KNIGHT (1885-1972) is considered by some the greatest American scholar of economics of the 20th century. An economics professor at the University of Chicago from 1927 until 1955, he was one of the founders of the Chicago school of economics, which influenced Milton Friedman and George Stigler.

A must-read for anyone who makes business decisions that have a major financial impact. As the recent collapse on Wall Street shows, we are often ill-equipped to deal with uncertainty and risk. Yet every day we base our personal and business plans on uncertainties, whether they be next month's sales, next year's costs, or tomorrow's stock price. In *The Flaw of Averages*, Sam Savage known for his creative exposition of difficult subjects describes common avoidable mistakes in assessing risk in the face of uncertainty. Along the way, he shows why plans based on average assumptions are wrong, on average, in areas as diverse as healthcare, accounting, the War on Terror, and climate change. In his chapter on Sex and the Central Limit Theorem, he bravely grasps the literary third rail of gender differences. Instead of statistical jargon, Savage presents complex concepts in plain English. In addition, a tightly integrated web site contains numerous animations and simulations to further connect the seat of the reader's intellect to the seat of their pants. *The Flaw of Averages* typically results when someone plugs a single number into a spreadsheet to represent an uncertain fu-

ture quantity. Savage finishes the book with a discussion of the emerging field of Probability Management, which cures this problem through a new technology that can pack thousands of numbers into a single spreadsheet cell. Praise for *The Flaw of Averages* "Statistical uncertainties are pervasive in decisions we make every day in business, government, and our personal lives. Sam Savage's lively and engaging book gives any interested reader the insight and the tools to deal effectively with those uncertainties. I highly recommend *The Flaw of Averages*." —William J. Perry, Former U.S. Secretary of Defense "Enterprise analysis under uncertainty has long been an academic ideal. . . . In this profound and entertaining book, Professor Savage shows how to make all this practical, practicable, and comprehensible." —Harry Markowitz, Nobel Laureate in Economics

This edited volume looks at whether it is possible to be more transparent about uncertainty in scientific evidence without undermining public understanding and trust. With contributions from leading experts in the field, this book explores the communication of risk and decision-making in an increasingly post-truth world. Drawing on case studies from climate change to genetic testing, the authors argue for better quality evidence synthesis to cut through the noise and highlight the need for more structured public dialogue. For uncertainty in scientific evidence to be communicated effectively, they conclude that trustworthiness is vital: the data and methods underlying statistics must be transparent, valid, and sound, and the numbers need to demonstrate practical utility and add social value to people's lives. Presenting a conceptual framework to help navigate the reader through the key social and scientific challenges of a post-truth era, this book will be of great relevance to students, scholars, and policy makers with an interest in risk analysis and communication.

Since I wrote the Foreword for the second edition of this book, risk management processes have become much more widely used, but controversy about what should be done and how best to do it has grown. Managing risk is a risky business. Chapman and Ward provide an in-depth explanation of why it is important to understand and manage underlying uncertainty in all its forms, in order to realise opportunities more fully and enhance corporate performance. They show what best practice should look like. The implications go well beyond the conventional wisdom of project risk management, providing an enlightening new perspective. —Professor Tony

M. Ridley Imperial College London, Past President, Institution of Civil Engineers
Chris Chapman and Stephen Ward continue to educate the profession with this masterful exposition of the differences between, and the potentials for combinations of, risk, uncertainty and opportunity. Particularly welcome is the way they integrate this trio into the project lifecycle – the bedrock of project management control and organization. —Peter W.G. Morris Head of School and Professor of Construction and Project Management University College London
Chris Chapman and Stephen Ward's books on Project Risk Management have been an essential part of my repertoire for twenty years, and they are top of my recommended reading for the courses I do on that subject. In this book they have enhanced their previous work to focus on uncertainty management and emphasise more strongly opportunities for improving project performance, rather than just identifying what can go wrong. A structured process is an essential part of managing project uncertainty, and their process is one of the most powerful. This book will be added to my repertoire. —Rodney Turner Professor of Project Management, SKEMA Business School Lille A profoundly important book. With *How to Manage Project Opportunity and Risk*, Chris Chapman and Stephen Ward take a good thing and make it better. Members of the project management profession have been influenced for years by their insights into project risk management. With this latest instalment the authors demonstrate that risk and uncertainty needn't be dreaded; in fact, the reverse side of the 'risk coin' has always been opportunity. My sincere appreciation to Chapman and Ward for turning this particular coin over and showing readers, academic and practitioner alike, the opportunity embedded in managing projects. —Jeffrey K. Pinto Andrew Morrow and Elizabeth Lee Black Chair in Management of Technology Sam and Irene Black School of Business, Penn State Erie

This book critically discusses and systematically compares J.M. Keynes and F. H. Knight, two giants in the history of economic thought. In 1921 they both published apparently similar books on risk, probability, and uncertainty. However, while Knight's contribution on risk and uncertainty is now well recognized, Keynes's work on probability and uncertainty has been somewhat ignored in the shadow of his more famous *The General Theory of Employment, Interest and Money* (1936). Focusing on an earlier yet equally important volume by Keynes, *A Treatise on Probability* (1921), this book sheds a light on his outstanding ideas and the lasting influence on his later

works, including *The General Theory*. There are few books that systematically discuss Keynes and Knight, although there are remarkable comparisons between Keynes's concept of probability and uncertainty and Knight's distinction between a measurable risk and a non-measurable uncertainty. This timely book unifies Keynes and Knight into a new, comprehensive approach to a very complex human behavior. This edited book offers the first complete overview of risk in the art market by bringing together contributions from a wide range of international thought-leaders on the topic – both practitioners and leading scholars who investigate the specific types of uncertainty that exist in the art market as well as the dominant models used to manage the risks. An essential read for both art world practitioners, as well as scholars and students, *Risk and Uncertainty in the Art Market* elucidates the dynamics and unique qualities of the art market as well as developing insights relevant to other sectors, including sociology, business and management, economics and finance.

Role of the entrepreneur in a distinct role of profit.

Written by leading experts in the field, *Social Theories of Risk and Uncertainty* is an introduction to mainstream theorizing on risk and uncertainty in sociology. Provides an overview of the historical developments and conceptual aspects of risk. Identifies why theorizing on risk is necessary and highlights specific sociological contributions to this field of research. Explores key topics including risk society and reflexive modernization, culture and risk, governmentality and risk, systems theory and risk, and edgework and voluntary risk taking. Offers a comprehensive look at the promises, pitfalls, and perspectives of risk theorizing.

Whether we like it or not we all feel that the world is uncertain. From choosing a new technology to selecting a job, we rarely know in advance what outcome will result from our decisions. Unfortunately, the standard theory of choice under uncertainty developed in the early forties and fifties turns out to be too rigid to take many tricky issues of choice under uncertainty into account. The good news is that we have now moved away from the early descriptively inadequate modeling of behavior. This book brings the reader into contact with the accomplished progress in individual decision making through the most recent contributions to uncertainty modeling and behavioral decision making. It also introduces the reader into the many subtle issues to be resolved for rational choice un-

der uncertainty.

Risk and Uncertainty in Dam Safety, is an authoritative, comprehensive, valuable and welcome contribution to dam safety practices. Through the presentation of a systematic and integrated process, it assists the dam owner in evaluating the needs for dam safety improvement, selecting and prioritizing remedial and corrective actions, and improving the operation, maintenance and surveillance procedures. The book is a result of the unique cooperation among experienced and knowledgeable dam owners, dam safety managers and engineers, and experts in the theoretical basis for risk assessment.

The Palgrave Encyclopedia of Strategic Management has been written by an international team of leading academics, practitioners and rising stars and contains almost 550 individually commissioned entries. It is the first resource of its kind to pull together such a comprehensive overview of the field and covers both the theoretical and more empirically/practitioner oriented side of the discipline.

In every decision problem there are things we know and things we do not know. Risk analysis science uses the best available evidence to assess what we know while it is carefully intentional in the way it addresses the importance of the things we do not know in the evaluation of decision choices and decision outcomes. The field of risk analysis science continues to expand and grow and the second edition of *Principles of Risk Analysis: Decision Making Under Uncertainty* responds to this evolution with several significant changes. The language has been updated and expanded throughout the text and the book features several new areas of expansion including five new chapters. The book's simple and straightforward style—based on the author's decades of experience as a risk analyst, trainer, and educator—strips away the mysterious aura that often accompanies risk analysis. Features: Details the tasks of risk management, risk assessment, and risk communication in a straightforward, conceptual manner Provides sufficient detail to empower professionals in any discipline to become risk practitioners Expands the risk management emphasis with a new chapter to serve private industry and a growing public sector interest in the growing practice of enterprise risk management Describes dozens of quantitative and qualitative risk assessment tools in a new chapter Practical guidance and ideas for using risk science to improve decisions and their outcomes is found in a new chapter on decision making under uncertainty Practical methods for helping risk

professionals to tell their risk story are the focus of a new chapter Features an expanded set of examples of the risk process that demonstrate the growing applications of risk analysis As before, this book continues to appeal to professionals who want to learn and apply risk science in their own professions as well as students preparing for professional careers. This book remains a discipline free guide to the principles of risk analysis that is accessible to all interested practitioners. Files used in the creation of this book and additional exercises as well as a free student version of Palisade Corporation's Decision Tools Suite software are available with the purchase of this book. A less detailed introduction to the risk analysis science tasks of risk management, risk assessment, and risk communication is found in *Primer of Risk Analysis: Decision Making Under Uncertainty*, Second Edition, ISBN: 978-1-138-31228-9.

At its core, economics is about making decisions. In the history of economic thought, great intellectual prowess has been exerted toward devising exquisite theories of optimal decision making in situations of constraint, risk, and scarcity. Yet not all of our choices are purely logical, and so there is a longstanding tension between those emphasizing the rational and irrational sides of human behavior. One strand develops formal models of rational utility maximizing while the other draws on what behavioral science has shown about our tendency to act irrationally. In *Risk, Choice, and Uncertainty*, George G. Szpiro offers a new narrative of the three-century history of the study of decision making, tracing how crucial ideas have evolved and telling the stories of the thinkers who shaped the field. Szpiro examines economics from the early days of theories spun from anecdotal evidence to the rise of a discipline built around elegant mathematics through the past half century's interest in describing how people actually behave. Considering the work of Locke, Bentham, Jevons, Walras, Friedman, Tversky and Kahneman, Thaler, and a range of other thinkers, he sheds light on the vast scope of discovery since Bernoulli first proposed a solution to the St. Petersburg Paradox. Presenting fundamental mathematical theories in easy-to-understand language, *Risk, Choice, and Uncertainty* is a revelatory history for readers seeking to grasp the grand sweep of economic thought.

Risk, Uncertainty, and Profit is a groundbreaking work of economic theory, distinguishing between risk, which is by nature measurable and quantifiable, and uncertainty, which can be neither be measured nor quantified. We begin with an analysis of the functions of profit, risk and uncer-

tainty in the economy. Frank H. Knight introduces his work with a discussion on profit and how there are conflicts about its nature between various economic theorists. As the title implies, the author's chief concern is the interplay between making a profit, incurring risk, and determining if there is uncertainty. Risks are different from uncertainty in that they can be measured and protected against. For example a location chosen for a factory or farm may have a measured risk of flooding in a given year. Businesses, insurers and investors alike can be made aware of this, and behave according to the quantified risk. For Knight, the larger business is able to mitigate the inherent uncertainties of, for example, launching a new product. Their financial resources are superior, and they can invest in market research and advertising, that a product may avoid failure and go on to deliver a profit for the company. Smaller companies and individual entrepreneurs therefore bear greater risks, but may reap proportionally greater rewards if their business eventually profits. Knight goes on to make the stunning observation that entrepreneurs and businesses receive monetary compensation not necessarily for innovating, but for bearing with uncertainties inherent to running a business. He also discusses the existence of the state: taxation policies, regulations and political instability can result in an uncertain environment that makes business both large and small harder to conduct. The author demonstrates an immense and disciplined knowledge and economic theory. He steadfastly presents his ideas with care not to deviate or contradict himself, that the reader may distinguish the interaction between the profit motive, quantifiable risk, and various uncertainties.

A comprehensive framework for assessing strategies for managing risk and uncertainty, integrating theory and practice and synthesizing insights from many fields. This book offers a framework for making decisions under risk and uncertainty. Synthesizing research from economics, finance, decision theory, management, and other fields, the book provides a set of tools and a way of thinking that determines the relative merits of different strategies. It takes as its premise that we make better decisions if we use the whole toolkit of economics and related fields to inform our decision making. The text explores the distinction between risk and uncertainty and covers standard models of decision making under risk as well as more recent work on decision making under uncertainty, with a particular focus on strategic interaction. It also examines the implications of in-

complete markets for managing under uncertainty. It presents four core strategies: a benchmark strategy (proceeding as if risk and uncertainty were low), a financial hedging strategy (valuable if there is much risk), an operational hedging strategy (valuable for conditions of much uncertainty), and a flexible strategy (valuable if there is much risk and/or uncertainty). The book then examines various aspects of these strategies in greater depth, building on empirical work in several different fields. Topics include price-setting, real options and Monte Carlo techniques, organizational structure, and behavioral biases. Many chapters include exercises and appendixes with additional material. The book can be used in graduate or advanced undergraduate courses in risk management, as a guide for researchers, or as a reference for management practitioners. The public depends on competent risk assessment from the federal government and the scientific community to grapple with the threat of pollution. When risk re-

ports turn out to be overblown" or when risks are overlooked" public skepticism abounds. This comprehensive and readable book explores how the U.S. Environmental Protection Agency (EPA) can improve its risk assessment practices, with a focus on implementation of the 1990 Clean Air Act Amendments. With a wealth of detailed information, pertinent examples, and revealing analysis, the volume explores the "default option" and other basic concepts. It offers two views of EPA operations: The first examines how EPA currently assesses exposure to hazardous air pollutants, evaluates the toxicity of a substance, and characterizes the risk to the public. The second, more holistic, view explores how EPA can improve in several critical areas of risk assessment by focusing on cross-cutting themes and incorporating more scientific judgment. This comprehensive volume will be important to the EPA and other agencies, risk managers, environmental advocates, scientists, faculty, students, and concerned individuals.

Assessment of risk and uncertainty is crucial for natural hazard risk management, facilitating risk communication and informing strategies to successfully mitigate our society's vulnerability to natural disasters. Written by some of the world's leading experts, this book provides a state-of-the-art overview of risk and uncertainty assessment in natural hazards. It presents the core statistical concepts using clearly defined terminology applicable across all types of natural hazards and addresses the full range of sources of uncertainty, the role of expert judgement and the practice of uncertainty elicitation. The core of the book provides detailed coverage of all the main hazard types and concluding chapters address the wider societal context of risk management. This is an invaluable compendium for academic researchers and professionals working in the fields of natural hazards science, risk assessment and management and environmental science and will be of interest to anyone involved in natural hazards policy.