The Palgrave Macmillan

Contemporary Challenges in Risk Management

Torben Juul Andersen

Dealing with Risk, Uncertainty and the Unknown

Contemporary Challenges in Risk Management

This page intentionally left blank

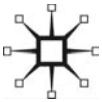
Contemporary Challenges in Risk Management

Dealing with Risk, Uncertainty and the Unknown

Edited by

Torben Juul Andersen
Copenhagen Business School, Denmark

palgrave
macmillan



Softcover reprint of the hardcover 1st edition 2014 978-1-137-44760-9

First published 2014 by
PALGRAVE MACMILLAN

Palgrave Macmillan in the UK is an imprint of Macmillan Publishers Limited, registered in England, company number 785998, of Houndmills, Basingstoke, Hampshire RG21 6XS.

Palgrave Macmillan in the US is a division of St Martin's Press LLC, 175 Fifth Avenue, New York, NY 10010.

Palgrave Macmillan is the global academic imprint of the above companies and has companies and representatives throughout the world.

Palgrave® and Macmillan® are registered trademarks in the United States, the United Kingdom, Europe and other countries

ISBN 978-1-349-49625-9 ISBN 978-1-137-44762-3 (eBook)
DOI 10.1057/9781137447623

This book is printed on paper suitable for recycling and made from fully managed and sustained forest sources. Logging, pulping and manufacturing processes are expected to conform to the environmental regulations of the country of origin.

A catalogue record for this book is available from the British Library.

A catalog record for this book is available from the Library of Congress.

Contents

List of Figures

List of Tables

Notes on Contributors

Torben Juul Andersen is Professor of Strategy and International Management at the Copenhagen Business School (CBS) and Director of Center for Global Strategic Responsiveness. He was the Associate Dean for the CBS Full-time MBA Program from 2008 to 2012. He previously taught financial economics at George Mason University and Johns Hopkins University, and held positions as Vice President at Citibank/Citicorp Investment Bank, Senior Vice President at Unibank, Managing Director of SDS Securities, and Senior Consultant with PHB Hagler-Bailly. He has authored a number of books including Managing Risk and Opportunity, Short Introduction to Strategic Management Strategic Risk Management Practice, Perspectives on Strategic Risk Management and Global Derivatives: A Strategic Risk Management Perspective. His scholarly articles have appeared in Strategic Management Journal, Journal of Management Studies, Journal of Business Research, Long Range Planning and Risk Management among others. He is an Honorary Fellow of the Institute of Risk Management (IRM) in London. His research interests focus on strategy-making processes, strategic responsiveness and strategic risk management issues. He holds a PhD in strategy and financial management from the University of North Carolina at Chapel Hill, an MBA in finance and international business from McGill University, and an MSc in economics from the University of Copenhagen.
Courses:

- Global Strategic Management
- Strategic Risk Management
- Risk Management for Corporate Leaders

Edward I. Altman was named to the Max L. Heine endowed professorship at Stern in 1988. Prior to his present position, Professor Altman chaired the Stern MBA Program for 12 years. He is an internationally known expert on corporate bankruptcy, high-yield bonds, distressed debt and credit risk analysis. He has received honorary degrees at the Hautes Etudes Commerciales in Paris, the University of Buenos Aires in Argentina, and Lund University in Sweden. Prof. Altman was listed

among the "100 Most Influential People in Finance" by the Treasury & Risk Management magazine. Among other things, he developed the Altman-Kuehne NYU Salomon Center Defaulted Bond and Defaulted Loan Index, one of the most well-known and respected index benchmarks. He and his colleagues are the only analysts providing statistics on the estimated size of defaulted and distressed debt markets. He was a founder and Executive Editor of the *Journal of Banking and Finance* and Advisory Editor of the John Wiley Frontiers in Finance Series. He has published and edited almost two-dozen books and more than 130 articles in scholarly journals. His works have appeared in many languages including French, German, Italian, Japanese, Korean, Portuguese and Spanish. His primary areas of research include bankruptcy analysis and prediction, credit and lending policies, risk management and regulation in banking, corporate finance and capital markets. Professor Altman received a PhD in finance from the University of California at Los Angeles (UCLA), an MBA in business finance from University of California at Los Angeles (UCLA) and a BA in economics from City College of New York.

Courses:

- Bankruptcy and Reorganization
- Corporate Finance

Richard A. Bettis holds the Ellison Distinguished Professor of Strategy and Entrepreneurship chair at the Kenan-Flagler Business School, UNC-Chapel Hill. His research has been published in the *Academy of Management Journal, Academy of Management Review, California Management Review, Journal of Management, Long Range Planning, Management Science, Organization Science, Strategic Management Journal and the Journal of World Business*. He is recipient of the Strategic Management Journal Best Paper Prize and has been an Associate Editor of the Strategic Management Journal for a decade. He was elected fellow of the Strategic Management Society, serving on its board of directors to become President Elect in 2002. He also served on the Board of Governors of the Academy of Management from 1989–1992. He consults for several firms and is a frequent speaker in management development programs. Recent clients include Bank of America, Dell Computers, General Electric, Johnson & Johnson, Merck, Motorola and Monsanto. Prior to his academic career he worked at General Motors as a product development engineer. His research focuses on strategic management issues, where his expertise extends to corporate strategy, global business

strategy and technology management. He received his PhD and MBA degrees from the University of Michigan.

Courses:

Corporate Strategy
Managing Uncertainty

Philip Bromiley joined the Merage faculty during Fall 2005, after holding the Curtis L. Carlson Chair in Strategic Management and chairing the department of Strategic Management and Organization at the University of Minnesota's Carlson School of Management. He is the author of over 70 journal articles and book chapters as well as the two books: *Behavioral Foundations of Strategic Management* and *Corporate Capital Investment – A Behavioral Approach*. He serves on the editorial boards of *Strategic Management Journal*, *Journal of Management Studies* and *Journal of Management & Strategy*. He previously served on the editorial boards of *Strategic Organization, Organization Science, Journal of Management* and *Academy of Management Journal*. His research-based commentaries have appeared in the National Association for Corporate Director's blog, Minneapolis Star-Tribune and St. Paul Pioneer-Press. He is frequently quoted in newspapers and magazines, including the Wall Street Journal and The New Yorker, also regularly appearing on television and radio. His research takes a behavioral approach to a variety of strategic management topics including risk assessment, temporal leadership orientations, corporate risk-taking, capital investments and strategic decision processes. In addition to a PhD from Carnegie-Mellon University he holds a BA from Johns Hopkins University.

Ulrik Christiansen is a PhD Candidate at the Department of Operation Management, Copenhagen Business School and works in the Internal Audit Department of the Danish Ministry of Defense and remains attached to the Ministry while completing his PhD studies in risk management-related topics based on experiences from the central administration. He has published his research in numerous working papers and an article in the *Scandinavian Journal of Management*. Before joining the Ministry of Defense, he worked as a Research Assistant at the Institute for Leadership and Organization at the Royal Danish Defense College. Prior to that, Ulrik Christiansen was a Navy Special Operation Soldier ('navy seal') and Team Leader at the Royal Danish Frogman Corps. He holds a Bachelor of Business Administration in Industrial and Organizational Psychology from the Copenhagen Business School.

Anders Østergaard Hansen holds an MSc in Finance and Strategic Management from the Copenhagen Business School (CBS) as well as a BSc in Economics and Business Administration. He was a teaching assistant in managerial economics for BSc students at CBS during his graduate studies with professional experience from Bain & Company and Handelsbanken Capital Markets as a corporate finance analyst doing company valuation and financial modeling. He also worked for media agency Adhost, building their business in the wider Copenhagen region.

Glenn Harrison is the C.V. Starr Chair of Risk Management & Insurance, and Director of the Center for the Economic Analysis of Risk (CEAR) in the Department of Risk Management & Insurance, J. Mack Robinson College of Business, Georgia State University. He has over 160 academic publications, including in general journals such as *Econometrica, American Economic Review, Journal of Political Economy*, the *Economic Journal*, the *Journal of Economic Literature, Journal of the American Statistical Association*, and the *American Journal of Public Health*, and in specialist journals such as the *World Bank Economic Review, Journal of Development Economics, Journal of African Economies, Journal of Environmental Economics & Management, Journal of Health Economics, Journal of Law & Economics, Experimental Economics* and *Journal of Economic Methodology*. His current research interests include risk and uncertainty, time preferences, subjective beliefs, experimental economics, and development economics. He has been a consultant for numerous government agencies and private bodies. These include the World Bank, the Swedish government and the United States Environmental Protection Agency, the Danish government, and counsel representing parties suing for economic damages. His research interests include experimental economics, law and economics, international trade policy and environmental policy. He received a PhD in economics and an MA Degree from the University of California, Los Angeles (UCLA).

Courses:

- Experimental Economics
- Environmental and Resource Economics
- International Trade Policy

Brenda Kuehne is an experienced Research Associate within the Credit and Debt Markets Research Program at the Salomon Center of the NYU Stern School of Business, where she has worked with Ed Altman con-

ducting analyses on high-yield defaults and recoveries, corporate bankruptcies and distressed debt. She has 12 years of fixed income product experience, having been previously employed by institutions such as TD Securities and Greenwich Natwest/Natwest Capital Markets as an analyst in credit and structured derivative products.

Stefan Linder is the author or co-author of a number of books including *Investitionskontrolle, Verhaltensorientiertes* and *Better Budgeting or Beyond Budgeting?* His research has been published in *Corporate Finance Review, European Accounting Review, International Journal of Strategic Change Management, Journal of Cost Management, Journal of Management & Governance, Risk, Compliance & Audit* and *Zeitschrift für Planung und Unternehmenssteuerung*. He is a frequent contributor to magazines and newspapers such as *CFO aktuell, Controller Magazin, ControllerNews and Frankfurter Allgemeine Zeitung*. His research areas comprise strategic and operational planning and budgeting processes, autonomous strategic action and bottom-up strategic entrepreneurship, and the motivational and behavioral impacts of management control systems. He received his PhD at the Copenhagen Business School. Before his academic career Dr. Linder was a management consultant with CTcon GmbH in Bonn, Germany.

Courses:

- Management Control
- Strategic Cost Management
- Management Systems Research

Richard D. Phillips conducts research in the financial risk management practices of insurers, use of financial pricing models of insurance, and various regulatory issues pertaining to the insurance industry. He has been advisor to the Federal Government and major US actuarial consulting firms, modeling property/liability insurer cash flows. He is a member of the American Risk and Insurance Association, American Finance Association and the Risk Theory Society. Dr. Phillips was named chair of the Risk Management and Insurance Department in July of 2006. His research has been widely published in the *Journal of Banking and Finance, Journal of Financial Economics, Journal of Financial Services Research, Journal of Insurance Regulation, Journal of Risk and Insurance, Journal of Risk and Insurance Regulation and Risk Management* and *Insurance Review*. He is the CEO and chairman of Risk Index Partners, a senior consultant with Charles River Associates, and a board member of

Munich American Reinsurance Corporation. He is a fellow of the Wharton Financial Institutions Center. He received a PhD and MA in Insurance and Finance from the University of Pennsylvania. His research interests focus on the areas of financial risk management, financial and insurance economics, and regulation of US insurance markets.

Devaki Rau's primary research interests focus on strategic decision-making, top management teams and management of expertise. Her research has been published in *Information Systems Frontiers, the International Journal of Management, Journal of Applied Psychology, Journal of Business and Management, Journal of Business Research, Journal of Management, Small Group Research, and Group and Organization Management*. She has also contributed to the *APA Handbook of Industrial and Organizational Psychology, Handbook of Decision Making, Handbook of Organizational Learning and Knowledge, and the Blackwell Handbook of Strategic Management*. She has prior business experience as a Senior Business Development Executive with CMC Ltd in Bangalore, India. She received her PhD in Business Administration at the Carlson School of Management, University of Minnesota.

Courses:

- Strategic Management
- Managing Organizations in Competitive Environments
- Business Policy: Strategy Formulation and Implementation

Hersh Shefrin is a pioneer of behavioral finance. He has published several books, including *Beyond Greed and Fear: Understanding Behavioral Finance and the Psychology of Investing*, recognized by J.P Morgan Chase as one of the top ten books used around the world as a textbook in behavioral finance. He has edited three volumes on Behavioral Finance*:* (1) *Behavioral Corporate Finance* analyzes the impact of behavioral phenomena on corporate finance, (2) *A Behavioral Approach to Asset Pricing* was the first book to systematically analyze how behavior affects modern asset pricing theory, and (3) *Ending the Management Illusion: How to Drive Business Results Using the Principles of Behavioral Finance* describes how to build organizational culture in order to mitigate vulnerability to behavioral traps that typically ensnare managers. Professor Shefrin's scholarly articles have appeared in *Discrete Mathematics, Economica, Economic Inquiry,the Journal of Finance, Journal of Financial Economics, Review of Financial Studies, Journal of Financial and Quantitative Analysis,*

Financial Management, Financial Analysts Journal, Journal of Investment Management, International Economic Review, Journal of Investment Consulting, Journal of Portfolio Management, Journal of Political Economy, Review of Economic Studies, Journal of Economic Theory, Journal of Econometrics, Quarterly Journal of Economics and the Quarterly Journal of Finance. He is frequently interviewed by the media on financial matters and the CFO Magazine listed him among the Academic Stars of Finance. He is a recipient of the IMCA Journalism Award from the Investment Management Consultants' Association. With colleague Meir Statman he received a Graham and Dodd award in 1994, and the 2000 William Sharpe Award for the best paper published in the *Journal of Finance and Quantitative Analysis*. Professor Shefrin holds an honorary doctorate from the University of Oulu in Finland. Areas of current research include behavioral risk management, and the application of behavioral ideas to the practice of risk management and financial decisions made by individuals. He completed his PhD at the London School of Economics. He earned an MSc in mathematics from the University of Waterloo and a BS (honors) in economics from the University of Manitoba.

Courses:

- Corporate Finance
- Behavioral Finance
- Behavioral Risk Management

Simon S. Torp is Associate Professor at Aarhus University, Denmark. He received his PhD from Copenhagen Business School and holds an MSc in Accounting from Aarhus University. His research interests cover strategic risk management, motivation and incentives and the interplay between management, finance and organizational structures. His current research has been published in the *International Journal of Strategic Change Management* and in *Economic and Industrial Democracy*.

Introduction: Contemporary Challenges in Risk Management

Torben J. Andersen

The Copenhagen Business School hosted the 6th *International Risk Management Conference* (IRMC) on June 24–25, 2013, in collaboration with the University of Florence, the Salomon Center at the NYU Stern School of Business and the International Finance Corporation under the theme: *Enduring Financial Stability – Contemporary Challenges for Risk Management and Governance*. The conference gathered leading experts from different academic and professional disciplines for two days of intense discussions about the challenges associated with risk management in unstable and unpredictable environments. The conference attracted a number of prominent keynote speakers to present leading ideas on different aspects of the risk management challenge. These included Ed Altman (NYU Stern School of Business), Rich Bettis (University of North Carolina at Chapel Hill), Phil Bromiley (University of California at Irvine), Glenn Harrison (Georgia State University) and not least Hersh Shefrin (Santa Clara University). The conference also brought valuable insights from corporate leaders presenting the experiences of knowledgeable practicing managers engaged in leading companies, such as the Carlsberg Group, Danmarks Nationalbank, Danske Bank, LEGO System and Nordea.

These voices brought many insights, perspectives and interesting new ideas to the conference venue, inspired by the diverse but related academic fields of finance, economics and strategic management covering various aspects of the risk management topic. This cross-fertilization of ideas and perspectives was quite revealing, showing that different academic disciplines approach risk management from somewhat different angles. Making these differences meet led to a reconsideration of the current understanding of risk management, and these key topics are richly represented in these chapters, which are authored, or co-authored, by keynote speakers and other conference participants. At various plenary

presentations, parallel seminars and professional workshops, some 150 international scholars from around the world engaged in discussions on topics introduced in keynote addresses, academic paper sessions and professional workshops. The current volume represents the flavor of these contributions in what appears as a truly "multifaceted" field of study that in many ways "bring[s] *management* back into risk management."[1]

The conference attracted prominent academics and professionals in behavioral finance, economics and strategic management to convene and exchange the latest insights about effective risk management practices in a truly diverse, thoughtful and engaged forum of international scholars and practitioners. The venue provided a great opportunity to show that views from different disciplines can bring new insights to the timely challenges of effective risk management practices. To demonstrate some of these insights, the current volume presents a selection of texts that each considers the implication of environmental uncertainty on risk perceptions and risk management approaches with perspectives from finance, economics, accounting and strategic management.

This confrontation of views is highly relevant. Risk managers that believe in the ability to objectively quantify exposures have to realize that the underlying risk perceptions are highly susceptible to human biases and consequently can change rather dramatically over time. In theory, rational investors will only commit resources to new business ventures with higher perceived risk if there is a higher future compensation associated with it. The higher the perceived risk, the higher the required compensation from investors, and the more restrained will be the resource allocation towards new business activities. However, the risk perception can vary significantly over time and often in seemingly irrational ways, which questions the efficiency of the economic resource allocation process in financial markets. In other words, understanding the effects imposed by fundamental uncertainty on risk perceptions might bring us a long way towards a better understanding of effective risk management practices, and risk responses can be applied for the benefit of contemporary organizations.

The additional return compensation required to invest in risky financial assets are captured, for example, by the difference between the expected equity return and the risk-free rate (the equity risk premium), and by the difference between the risky bond rate and the risk-free rate (the default spread). A simple examination of the default spread of Moody's Baa-rated corporate bonds and the equity risk premium in the United States during the period 1960–2010 reveals tremendous shifts in the risk compensation required over time (see Figure I.1 below).

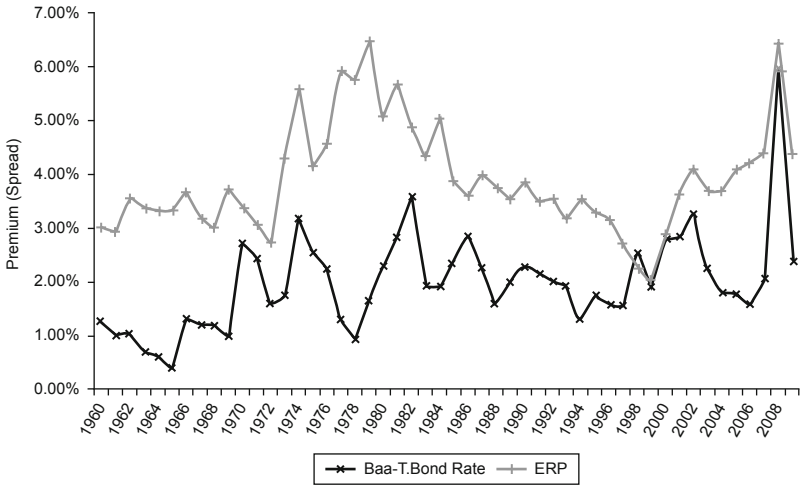


Figure I.1 Equity risk spreads and default spreads on Baa-rated corporate bonds
Source: Andersen, Garvey and Roggi (2014) – from Aswath Damodaran's website.

When looking at the time series of risk premiums (spreads) ascribed to risky financial assets, it becomes clear that the investors' assessment of the level of risk and the price of this perceived risk has taken some excessive turns at different times. For example, investors were charging far higher prices for risk during the years 1978–1982 and in 2008 after the financial crisis compared to, say, in 1969 and 1999. As is apparent, the investment and general business climate changes over time, and affects the way investors and corporate decision-makers perceive risk and the value of financial assets, which eventually affects the way strategic decision-makers engage in new commercial ventures that develop corporate business activities.

This simple empirical exercise serves as a subtle reminder that the way investors and corporate decision-makers perceive the riskiness of the prevailing business climate has a significant bearing on the way economic resources are devoted towards new value-creating activities and are allocated across different industries and business activities. The seemingly wild gyrations in the risk assessment of the same classes of risk in modern times may also suggest that there are irrational forces at play during periods of market exuberance as well as in periods of economic depression. In other words, gaining a slightly better understanding of the human factors that are at play here, while developing

techniques to better assess them, could help in making risk management practices more effective. To a large extent, the various chapters in this book demonstrate this approach.

Based on updated field observations among professional market investors, Hersh Shefrin (in Chapter 1) convincingly demonstrates how, over the past decade, perceived risk and perceived expected return have shown systematic inverse relationships. As one of few contributions seeking to measure the risk-return relationships from an *ex ante* perspective, the reported findings provide truly intriguing insights somewhat at odds with the prevailing assumptions of the capital assets pricing model (CAPM). The observations suggest that the phenomenon arises from a behavioral component where investors form systematic biases around expected returns where irrational investors expect higher returns from safe stocks and bid down prices of more risky stocks whereby the low-beta stocks receive an excessively high return.

In Chapter 2 Philip Bromiley and Davaki Rau look at the practical challenges of enterprise risk management (ERM) frameworks. There are obvious advantages associated with comprehensive, systematic, integrated approaches to managing business risks. But there are also significant downsides, such as, the difficulty of determining strategic risk outcomes that often are unpredictable, with unknown outcome distributions. Hence, strategic decision-makers typically rely on managerial judgments and personal opinions that may sharply deviate from reality. The risk management process carries bureaucratic costs, so there is a real trade-off between adopting a costly risk-avoidance system in contrast to a low-cost approach of quick adaptation.

In their chapter, Torben J. Andersen and Richard A. Bettis (Chapter 3) note the common perception that executive decisions are often biased by their experiential heritage and the economic situation of the firm, where abnormal risk-return outcomes can derive from subconscious irrational behaviors. However, a simple simulation model of strategic adaptation shows that when firms have heterogeneous response capabilities, they inevitably produce the empirically observed inverse cross-sectional and longitudinal risk-return relationships. In fact, even if most firms succumb to irrational behaviors, the inverse risk-return relationship arises if just a few firms display good strategic responsiveness traits. The performance data used in this analysis corresponds to realized (*ex post*) accounting returns, for example, return on assets, and not to *ex ante* perceived risk-return relationships.

Anders Ø. Hansen and Torben J. Andersen look at empirical evidence on potential risk management benefits, where a basic challenge relates

to the adoption of a proper risk management measure (Chapter 4). They argue that effective risk management is evidenced by low variability in returns over time, reflecting an ability to deflect major risks, which is captured in a measure of realized risk management competences. They do not specify the risk management process itself, which could deviate from the comprehensive system proposed by the conventional ERM framework, leaning instead towards the simpler approaches proposed by Bromiley and Rau. Using corporate data from over a thousand firms over a period of 20 years (1991–2010), the study finds that effective risk management capabilities are associated with lower risk (betas) and lower expected default rates (Altman's Z-scores).

Simon S. Torp and Stefan Linder argue in Chapter 5 that outcomes in dynamic and complex environments are highly uncertain and difficult to predict, thus posing a challenge to conventional risk management practices of identifying, assessing, managing and monitoring foreseeable risks. Hence, the ability to deal with unexpected events builds on creativity and an organizational climate conducive to innovative solutions. This climate is related to the leadership style displayed by top management and a decision structure that engages middle managers in strategic decisions. In a study of two hundred Danish companies, the authors find that firms with low variability in earnings flows impose an organizational structure where knowledgeable managers participate in strategic decisions induced by a supportive leadership style.

In Chapter 6 Ulrik Christiansen presents different risk management perspectives, as discussed in the management accounting literature, where the registration of risk and performance outcomes are often seen to reflect the perceived reality of the users of the information. Christiansen reviews the last 20 years of research in management accounting, and the use of risk management systems, focusing on the tension between centralized control and decentralized responses. The study shows how risk management is tied to other management systems, including management controls, budgets and performance measures. He suggests that more attention should be paid to understanding the mechanisms of how risk management enables and constrains responsive actions as risk information is developed, reported and used in organizations.

Glenn W. Harrison and Richard D. Phillips present in Chapter 7 an ongoing project comparing financial risk assessment through conventional econometric extrapolations versus solicited subjective beliefs from professional Chief Risk Officers (CROs). This research project has evolved over the past year to reveal some interesting difference between

"objective" forecasts and "subjective" beliefs, where the expert professionals see less tail risks with lower standard deviation of pooled market beliefs, and generally more positive yield forecasts. In contrast, the expected costs of credit risk hedges appear consistent with objective projections. These insights may help improve risk assessments based on insights about differences between the two sources of risk information and the distribution of subjective professional beliefs.

Finally, Edward I. Altman and Brenda J. Kuehne review the risk prone markets for high-yield bonds and leveraged loans over the past decades, based on the most recently updated market information (Chapter 8). The analysis identifies generally improved market conditions with lower yields and improved default projections in recent years after the financial crisis. The chapter provides an authoritative analysis of various aspects of bankruptcy effects, reorganizations, default losses, and recoveries, including updated mortality and default rate forecasts. Despite the low default environment, the authors have detected emergent risks related to the sluggish economic developments in the US and China as well as retained sovereign debt issues in Europe where the economic fundamentals fail to show real improvements.

We hope you will find the various chapters in this book interesting and inspiring.

Note

1. The quotes are terms used by Hersh Shefrin (2013) during the conference.

Reference

Andersen TJ, Garvey M, Roggi O. (2014). *Managing Risk and Opportunity: The Governance of Strategic Risk Taking*. Oxford University Press: Oxford.

1

Distinguishing Rationality and Bias in Prices: Implications from Judgments of Risk and Expected Return

Hersh Shefrin

Introduction

There is a gulf between what theory and practice tell us about how risk premiums reward investors for bearing risk. An elegant theory relates expected return to both mean-variance efficient portfolios and to the covariance between returns and a pricing kernel. However, this theory has not proved to be especially valuable in empirical work, where risk premiums are instead explained using simple factor models involving size and book-to-market equity (B/M), for which there is little theoretical justification.

There is also a lack of consensus on the root cause of the factor structure associated with the cross-section of stock returns. One possibility is that the factor structure reflects fully rational prices, while another is that the factor structure reflects investors' behavioral biases. Fama and French (2004) argue that it is not possible to distinguish between the two possibilities empirically, and have maintained this position even with the emergence of new results about sentiment-based predictability in returns (e.g. Baker and Wurgler, 2006, 2007). This lack of agreement among scholars is partly due to a reliance on realized returns in discriminating between various explanations (Black, 1993). In this regard, the moments of realized returns are *ex post* variables that cannot be automatically equated with investors' *ex ante* judgments of risk and expected returns.

To shed light on whether prices are fully rational, or instead reflect behavioral bias, I introduce new data consisting of judgments by

professional investors about the risk and returns of holding different stocks. These data, collected over a 15-year period, paint a clear, consistent picture of the cross-section of investors' judgments of stock market risk and return. My findings indicate that investors' collective judgments about risk and expected return display some of the rational pricing features emphasized by Fama and French (2004) and some of the behavioral features emphasized by Baker and Wurgler (2006, 2007).

With respect to Fama and French, I find strong and consistent evidence that investors' judgments about risk are negatively correlated with size, and positively correlated with B/M. This finding accords with the Fama-French view, even though Fama and French admit that they have no compelling explanation for why size and B/M should underlie systematic risk. Nevertheless, my data show that investors do indeed judge large cap stocks to be safer than small cap stocks and growth stocks to be safer than value stocks.

With respect to Baker and Wurgler, I find that investors' collective judgments about expected return are significantly related to the sentiment variable (SENT) (Baker and Wurgler, 2006). Notably, sentiment modulates the relationship between both size and realized returns, and B/M and realized returns. My findings show that sentiment modulates investors' judgments about these relationships as well.

With respect to bias, I find that investors' collective judgments about the cross-section of expected returns are consistently at odds with the cross-section of realized returns. My results indicate that the majority of investors expect higher returns from large cap stocks than from small cap stocks, and higher returns from growth stocks than from value stocks. In other words, investors act as if they attempt to implement a Fama-French factor model, but in the course of doing so, reverse the signs of the coefficients.

My data suggest that the bridge between the rational price view of risk and the behavioral view of expected return involves investors' judgments of how risk and expected return are related. Ganzach (2000) reports evidence that investors perceive risk and expected return to be negatively related. Finucane (2002) discusses why judgments based on effect generally induce people to believe that risk and benefits are negatively related. In this regard, stocks are just one example. My data indicate that the majority of investors form judgments of risk and expected return as if they believe that the capital market line is negatively sloped and the security market line is negatively sloped. Therefore, even if they form appropriate judgments about a security risk, most form biased judgments about the associated expected return.

At the same time, my data make clear that not all investors are alike. There is substantial heterogeneity in investors' judgments of risk and return. Roughly 20% of the investors in my sample make judgments in line with the Fama-French view. I became aware of this heterogeneity in 1999 when I ran an in-company workshop for a US hedge fund specializing in value investing. My analysis showed that along almost every dimension, the judgments of the fund's director of research and chief investment officer (CIO) were in line with the Fama-French view. However, my analysis also showed that less than 15% of the portfolio managers and analysts reporting to the CIO formed like-minded judgments. Instead, most expected higher returns from larger cap stocks than from smaller cap stocks, they expected higher returns from growth stocks than from value stocks, and judged the relationship between risk and return to be negative.

I suggest that taken together, the three following elements combine to make the case that prices are not fully rational, and instead reflect behavioral bias. First, Baker and Wurgler (2006, 2007) document return predictability based on sentiment. Second, the relationship between investors' judgments of expected return and Baker-Wurgler sentiment is positive and statistically significant. Third, the judgments about risk and expected return in my data feature biases that remain strong and consistent over the 15 years of my sample.

There is a long tradition in finance about the difficulty of using realized returns alone to identify the degree to which prices are fully rational. Black (1993) suggests that the connection of realized returns to size and B/M most likely stems from data mining, and it is with this in mind that Shefrin and Statman (1995, 2003) suggest analyzing whether size and B/M drive investors' judgments, instead of focusing exclusively on realized returns. Doing so avoids the data mining quandary. To this end, they use data involving judgments about stocks' value as a long-term investment (VLTI) from *Fortune* magazine's annual corporate reputation survey. Notably, they find that judgments about VLTI strongly and consistently reflect size and B/M over time.[1]

Shefrin and Statman report that VLTI is positively related to size and negatively related to B/M, which are opposite in sign to those for realized returns. They argue that this pattern suggests that prices reflect bias, and therefore are not fully rational. This line of argument appears to have had a limited impact among those debating whether or not prices are *rational* or *behavioral* (Fama and French, 2004). There are at least two possible reasons for this limited impact: first, because VLTI, unlike expected return, has no clear or precise definition; and second,

demonstrating irrationality on the part of some investors, even many investors, does not necessarily imply that these irrational elements are manifest in market prices.

In Shefrin (2001), I reported the results from data based on workshops given in 1999 and 2000. My new data strongly reinforce the original findings from Shefrin (2001), and provide additional insight into the arguments advanced in Shefrin and Statman (1995, 2003). In my sample, VLTI is nearly always positively related to size, and negatively related to B/M. Moreover, with few exceptions, the size and B/M sign patterns for my data coincide with those from the *Fortune* data, for the years in which I have access to data from both. These findings provide further indications about the associations involving VLTI, size and B/M.

At the same time, my data suggest that VLTI is not a perfect proxy for judgments of expected return. I find that although VLTI is positively correlated with judgments of expected return, at times it is also negatively correlated with perceived risk. Moreover, the strengths of the correlations vary over time. From 2005 on, perceived risk impacts VLTI as strongly as expected return. Indeed, in both 2009 and 2012, perceived risk is statistically significant, but expected return is not. These results make clear that treating VLTI as a perfect proxy for expected return can be problematic.[2] The results also highlight the importance of having data directly measuring expected returns.

The remainder of this chapter is organized as follows: the next sections review the current thinking about the nature of risk and expected return in the asset pricing literature, describe the data, and present the cross-sectional properties of perceived risk. The subsequent sections discuss the cross-sectional properties of expected returns and analyze the behavioral features underlying the relationship between perceived risk and expected return. Then the strength of the relationship between expected return and the Baker-Wurgler sentiment index is described, the cross-sectional properties of the expected return series derived from analysts' target prices is discussed, and the findings are related to earlier work based on the annual *Fortune* magazine reputation survey as a robustness test. Finally, the main issues are recapitulated and some basic conclusions are drawn from the study. Appendices 1–5 contain supporting details and provides a Bayesian perspective to interpret results.

Current thinking about the nature of risk and return

Fama and French (2004) survey the theory and evidence associated with the capital asset pricing model (CAPM). They point out that the CAPM