

BOOK REVIEWS

When All Else Fails, Government as the Ultimate Risk Manager, by David A. Moss, 2002, Cambridge, Massachusetts: Harvard University Press

Reviewer: David C. Marlett, Old Dominion University

How did the government of a country known for its hostility toward government intervention and the promotion of free markets evolve into an active and aggressive risk manager? The purpose of this book is to offer an explanation. The author combines a historical perspective of the economic development of the United States, with insightful political analysis and economic theory to analyze why the government so often acts as the ultimate risk manager.

The term “risk manager” is presented somewhat differently from the traditional view held by many in our field. Rather than examining the actions intended to mitigate and finance risk, the author admittedly focuses on policies designed to reallocate risk (shifting risk to another party). Limited liability, bankruptcy, and product liability laws are provided as examples of risk allocation. There are discussions on “insurance” issues such as workers compensation, social security, and unemployment insurance, but these are not the primary focus.

When All Else Fails begins with a primer on the history of risk, somewhat like a condensed version of Bernstein’s *Against the Gods*. The main theme of this chapter is to explain why private markets often fail to handle risk and why the government is then called upon to fill the void. The private sector risk-related failures are first illustrated by descriptions of adverse selection and moral hazard. In addition to these classic explanations, Moss offers numerous other scenarios in which private markets fail and categorizes them under the headings of *perception problems*, *commitment problems*, and *externalization problems*.

The author then proceeds through U.S. history chronologically, dividing it into the following three phases:

Phase I: Security for Business (up to 1900)

Phase II: Security for Workers (1900–1960)

Phase III: Security for All (since 1960)

The three phases reflect the evolution of risk management policy as it adjusts to shifts in social priorities. The first phase includes an era in which the overriding objectives were economic growth, trade, and investment. The second phase was defined by the

industrial development of the United States and growing power of labor. The third phase is defined by the expansion of the role of the government to not only protect industry and laborers, but everyone. Moss notes that the growth in risk management activity reflects an unmistakable shift in social priorities from economic growth to security over the past two centuries.

Phase I, *Security for Business*, is covered in chapters 3 (Limited Liability), 4 (Money), and 5 (Bankruptcy). Chapter 3 describes the creation of limited liability laws designed to protect investors. The laws shifted a portion of the default risk from shareholders to creditors. The author describes events from the early to mid-1800s showing the government's efforts to increase economic growth via increased investments. The primary constraint to increased investment was the potentially devastating consequences of unlimited personal liability. Limited liability laws were enacted by states competing to lure business into their domain. Chapter 4 focuses on the recurring panics and bank runs of the nineteenth century. Lawmakers realized they needed to improve the management of the money supply and decrease *money risk* (the uncertainty about the value of money). Moss focuses on the risk management policies intended to achieve security in the banking sector without dramatically impairing credit and liquidity needed for economic growth. Chapter 5 describes the risk allocation benefits of bankruptcy law. The primary objective of implementing bankruptcy laws during the nineteenth century was to promote economic growth, and the result was a transfer of risk from debtors to creditors.

Phase II, *Security for Workers*, is covered in chapters 6 (Workers' Insurance) and 7 (Social Security). Chapter 6 examines the early 1900s, a time when workers faced increasing occupational risks. As workers migrated to urban settings, they lost family support systems so important in times of unemployment, illness, or injury. Under pressure from labor unions and social activists, lawmakers struggled to allocate risk between employers and the labor force. Despite achieving success with the creation of the workers' compensation system, the author notes the United States lagged behind most European nations in enacting social insurance laws (health and unemployment insurance). Chapter 7 continues to examine the new emphasis on security for workers by reviewing the creation of the social security program. Moss details the economic and political rationale behind the initial program design. He also explains the reasons for the creation an unemployment insurance program and why a comprehensive health insurance program was not created.

Phase III, *Security for All*, is addressed in chapters 8 (Product Liability Law) and 9 (Security for All). Using product liability laws, Moss displays the changing nature of the role of the government. The objective of consumer protection now surpasses promoting economic growth. Beginning in 1960, a series of court rulings changed the direction of responsibility for injuries. No longer did old logic of *buyer beware* rule; instead the risk was shifted to the manufacturers, wholesalers, and retailers. Moss explores the logic behind this transformation. Chapter 9 explores three distinct manifestations of phase III policymaking: the rise of federal disaster relief, the creation insurance guaranty funds, and the expansion of environmental liability laws. It is clear that after 1960, security for consumers and the average citizen becomes the dominant priority, and security for business is secondary. Moss states that this is not intended to be an exhaustive list, but provides examples of the shifting of risks away from individuals and onto firms and the government.

In the final chapter, Moss goes back to his original question of why the government of a country firmly rooted in free markets come to rely so heavily on public risk management. He points to the evolving social objectives and lawmakers' practical inclination to use the state to address social problems. Moss concludes with a review of the many cases in which Americans are willing to ignore the free market principles in the face of substantial risks.

Based on the title and recent release of this book, I expected a discussion on government activity in financing and mitigating catastrophic events, natural disasters, and terrorism, for example. It turns out that these issues are not the focus. Terrorism is only briefly mentioned in the first few pages of the preface when the author acknowledges that the book was completed prior to September 11, and ready for press soon after. Although it is certainly not the author's fault, the book misses out one of the costliest and most expansive risk management efforts yet by our government.

In summary, this is not a book detailing current risk management programs implemented by the government. Rather than describing how various government programs operate, the author describes the economic and political reasoning on why they exist at all. The book offers an overview of the historical events that led to the development of government programs rather than a description of the programs themselves. The political analysis is insightful and all events are certainly well documented (there are over 100 pages of endnotes). I found the approach very interesting and enjoyed reading each chapter. My only concern was that risk control was somewhat neglected. The author addresses this issue and admits risk control is such a broad topic it would be better off addressed in a separate volume. The most interesting parts in my opinion are the recurring arguments both for and against government involvement. The arguments heard in the eighteenth and nineteenth centuries sound so familiar they could be on today's *Wall Street Journal*.

CGL Policy Handbook, 2001 Supplement, by Clarence E. Hagglund, Britton D. Werner, Andrew F. Whitman, and Arlene Jorgensen Hillestad, New York, NY: Aspen Law and Business

Reviewer: Laureen Regan, Temple University

The Commercial General Liability (CGL) insurance policy developed by ISO is widely used and has a long history. The contract has also been the subject of extensive coverage litigation. The 2001 Supplement to the *CGL Policy Handbook* includes the latest case law regarding contract disputes over coverage under the standard CGL form. The book is designed to replace the pages in the main volume that become outdated by new case law and new contract language. The ring binder format facilitates replacing pages in the main volume. The book is written for attorneys specializing in insurance coverage litigation, and, as such, includes a thorough discussion of case law across jurisdictions. The book does not appear to be biased toward either defense or plaintiff attorneys, giving it a wider potential audience. Moreover, the insurance professional might also find this book useful, since it does explain complex legal issues in simple and direct language.

Combined with the *Handbook*, this Supplement is a valuable reference for those who teach courses in insurance contract analysis. The chapters are clearly organized, the index is thorough, and questions raised in class can be easily researched. Each chapter begins with a history of the particular coverage language, and the chapters are

arranged as they would be found in the actual policy form. For example, the first chapter reviews that case law that defines "bodily injury," the second "property damage," and those following explain important exclusions. The exclusions for property damage and pollution are given extensive treatment, which is fitting given their complicated nature, and the level of litigation surrounding these exclusions. The book concludes with an Appendix that contains sample CGL forms, as well as excerpts from the *ISO Commercial Lines Manual*. The sample policies are in chronological order, according to when they were introduced by ISO, so the user can more fully understand the impact of changes in policy language and interpretation on prices and breadth of coverage.

One useful feature of this text, which others of its kind lack, is a chapter on risk management. This chapter is well written, and emphasizes the idea that insurance coverage is only one element of a comprehensive corporate risk management strategy. The chapter contains suggestions for loss control for liability exposures, as well as other methods to reduce insurance premiums. These latter include eliminating overlapping coverage, increasing deductibles, and choosing appropriate limits. There is also a useful discussion on integrating the CGL policy with the insured's other liability contracts.

One of the most active areas of litigation in the CGL has been over the meaning of the occurrence trigger. This determination is most important for long-term exposure types of injuries, such as those arising from asbestos. The insurer's ultimate burden for paying claims can far exceed the limit upon which the policy was priced, depending on the court's definition. This is especially so when court decisions result in stacking of limits over multiple policy periods. One outcome of such interpretations of the occurrence trigger has been a reorganization of the commercial lines market. Another is the introduction of the claims-made CGL form. The discussion of the evolution of the CGL coverage trigger is especially well done. Differences in insurer responsibility under the CGL for each coverage form are carefully explained, and sample CGL claims-made forms are included in the Appendix for comparison.

The text does contain citations to numerous cases, but unlike in most other references of this kind, these do not distract the reader. The citations are not exhaustive, but rather illustrative, and the implications of the case decisions are carefully explained. Also, the language is plain, sentences are comparatively short, and the Supplement is easy to read and understand. If the *Handbook* itself is as well done, I would recommend it as a valuable reference.

Elimination of Risk in Systems: Practical Principles for Eliminating and Reducing Risk in Complex Systems, by James Bradley, Tharsis Publishers

Reviewer: James Kallman, St. Johns University

As a specialist in risk control, the title of this book really enticed me. But I have delayed writing the review for a long time; I even re-read the book—twice. Although there are some very interesting parts, in general, I was quite disappointed.

Chapter 1, What is a System, is a basic and well-written explanation of a system. The author carefully describes systems, subsystems, and different types of systems.

Chapter 2, System Throughput and System Resources, adds some interesting system terminology but as the author admits, could easily be skipped. Instead, the chapter can be regarded as an introduction to operations management concepts.

Chapter 3, System Throughput with Resource Sharing, describes system throughput if resources are shared by more than one process. This is fairly common in business and is familiar to most professors too. For example, how many of us share network printers? At this point the author introduces the first of many (usually confusing) equations to describe the relationships (a function denoted as K) between throughput capacity (I) and resource (R) sharing (s). Hence $I = K(R(1+s))$ is the throughput capacity equation for shared resources. This equation, modified for what are described as full sharing and over-sharing conditions, forms the basis for adjustments by risk elimination projects.

Chapter 4, Objective and Subjective Risk Measures, inserts an unusual perspective of the author. He suggests that the conventional risk measure, the standard deviation, contains "a hidden subjective component deliberately built into it" (p. 43). He states standard deviation is an appropriate tool for analyzing risk in financial systems "primarily due to Markowitz" (p. 44). But for more general systems the author proposes a Mean-Expected-Loss (MEL) risk measure, which he claims is more useful. The standard deviation risk measure, he proposes, "can be confusing to those not versed in statistics, and is certainly not immediately conducive into gaining insight into the nature of risk" (p. 54). Because the concept of standard deviation is taught in the first semester of statistics, this objection has little credibility. Yet, the author forges ahead with the MEL method as a more objective measure of risk, which takes into account the subjective nature of man. The author tries to convince the reader that standard deviation is subjective and his MEL is objective. However, it also contains subjective variables. His assertion that standard deviation is "fundamentally flawed" (p. 59) is itself fundamentally flawed. Though mildly interesting, this chapter too could be skipped.

Chapter 5, System Throughput and Risk, is intended to "look at a fundamental relationship between the expected (or average) throughput capacity of a system and the risk of the environment in which the system operates" (p. 62). Unfortunately, the chapter's purpose is frustrated by confusing sentences. For example, "[t]he risk equation states that throughput capacity is the throughput capacity when no risk is run, that is, KR , plus the best case extra throughput capacity when the risk is run but the hazard risk does not occur, less the average losses with respect to the best case due to hazards actually occurring" (p. 63). It appears that the editor has not done a sufficient job of assisting the author. Another example demonstrates this problem: "The risk equation is a statement of the following rules. First, throughput capacity for a given system resource level R increases linearly with R (for valid R changes)" (p. 63). This chapter became so frustrating that I eventually gave up reading the remainder of the chapter in hopes that chapter 6 would provide the material suggested by the book's title.

Chapter 6, Risk Elimination using Preventive Resources, begins by repeating material that is introduced in chapter 4 and is also repeated in chapter 5. That is, throughput capacity is a function of three variables: the level of resources used, the system used to "run the risk," and losses that occur during production (p. 89). The author next develops several production equations that measure the decreases in production caused by throughput hazards. However, he has yet to discuss any risk prevention

techniques to decrease system risk. I find this to be contradictory to the book's title and stated purpose—providing practical principles for eliminating and reducing risk in complex systems. Finally, after 102 pages, the author begins writing about loss control techniques. Given the author's background, it is not surprising to find the loss control descriptions to be different than those familiar to students of risk management. For example, the author describes two kinds of preventative resources. The first, "hazard prevention resources" (p. 102) are described as activities that reduce or eliminate the risk of the hazard actually occurring. The author next proposes "hazard recovery resources" as "disaster recovery resources come into play only after the hazard has occurred" (p. 102). In contrast, in the risk management discipline, these activities are usually described as "loss control projects" that decrease the probability and/or the severity of losses. The term "prevention" is usually restricted to loss control projects whose purpose is to decrease the probability of loss. The term "reduction" is used to describe loss control projects whose purpose is to decrease the severity of loss. This deviation is amplified when the author suggests that the "[u]se of hazard-prevention resources P can be regarded as a form of insurance, where payment for the preventive resources instead of to an insurance company" (p. 103). This substitute-good concept follows an early theory proposed by Ehrlich and Becker (1972), and cited as recently as Kelly and Kleffner (2003). The author adeptly demonstrates that a small investment in preventative resources provides (insurance) savings that are very much greater than the cost of the loss control project. However, the author fails to add that modern risk control theory proposes that loss control projects not only can be substitutes for risk financing, but can also be complementary goods (Kallman, 1998). While the author admits "there is a significant difference" between insurance and preventative resources (p. 103), he shows that in the special (usual?) case of financial systems adding preventative resources will increase firm value. Unfortunately, as a proof, he uses a simple equation (the CAPM) and makes it unnecessarily complex by forcing the equations introduced at the beginning of the chapter. Yet the point is well taken, loss control projects often do contribute to shareholder value.

In chapter 7, Risk Elimination using Precautionary Procedures, the author repeats the important message established in the previous chapter—"it is possible to improve the throughput capacity of the risky environments [by adding] preventative resources" (p. 117). To me, this chapter is the best one in the book. It is here that the author discusses how loss control adds value to the firm and helps achieve optimal returns. He introduces two types of loss control techniques: precautionary and emergency procedures. Precautionary procedures are used when the possibility of losses is known in advance; emergency procedures are used for post-loss conditions (p. 119). He then shows how adding such precautionary procedures will prevent throughput capacity losses and consequently improve earnings. Next he provides three basic kinds of precautionary procedures: check out, fractionating, and avoidance (p. 127). Check out procedures examine hazards carefully. Knowledge of the hazards is sometimes sufficient to modify behavior and decrease the chance of losses. Fractionating is breaking up a system or process to decrease the severity of loss. It is akin to not putting all your eggs into one basket. The author has a peculiar definition for avoidance. This precautionary procedure involves removal of the risk factor; for example, de-icing a wing. The author states that all of these techniques require time—but that the slow down in production can be optimized. He uses an equation and shows how, through calculus, throughput (with precautionary procedures) is optimized.

Chapter 8, Risk Elimination using Monitoring Procedures, discusses monitoring procedures to track risk but also points out that many financial risks are randomly distributed. So, the signals gleaned from the monitoring system may not be useful. The author suggests setting up response systems only if the monitoring systems detect valid signals. The rest of the chapter is a very detailed description of monitoring (database) systems. Again, it is one that could be skipped.

Chapter 9, Margin of Safety and Ruinous Risk, is another good chapter. The author suggests a margin of safety is “one of the most important ideas in risk elimination” (p. 163). As proof, he provides a throughput (I) equation that includes preventative resources (P) and shows how, up to some point, preventative resources add to production: $I = f(P, \dots)$. Creating a margin of safety adds surplus preventative resources to the system. With this margin of safety, even if extraordinary losses occur, the throughput capacity is never reduced below a desired (optimal) level. Employing a margin of safety is an appropriate strategy for mission critical operations such as space programs or hospitals. The author points out that even though preventative resources also consume the organization’s scarce time, there is a similar equation for determining the optimal time to allot to surplus preventative resources. Finally, he points out a further advantage of providing a margin of safety: the organization can save time and money because no risk monitoring is needed. The author does a good job of also pointing out the disadvantages of employing surplus preventative resources to create a margin of safety. The first is that the initial cost of a safety project may dissuade managers with short-term investment horizons. The second is the opportunity cost of using scarce resources for preventative resources. The system is inhibited from using the same resources for speculative projects.

There are some very good parts to this book. One can easily appreciate the author’s wisdom in promoting risk control projects. The unusual terminology is a little discouraging, but the major objection to the book is its confusing sentence structures and unclear equations. It was a struggle to get through this book, even though, as a risk control specialist, I was highly motivated. I will keep the book in my risk control reference library, but hesitate before recommending the book to anyone.

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Flexible Benefits: A How-To Guide (6th ed.), by Richard E. Johnson, 2002, International Foundation of Employee Benefit Plans, Washington, D.C.

Reviewer: J. Tim Query, Illinois Wesleyan University

As the title aptly describes, this book is positioned as a resource for those involved with strategic planning as it relates to human resource operations. A proliferation of choices exists today for organizations desiring to customize their work environment in a manner that maximizes such interrelated goals as job satisfaction and productivity.

Flexible Benefits is written to help HR professionals navigate through the morass and make the most effective and efficient use of employee benefits.

The 378-page paperback book is authored by Richard E. Johnson, president of Partners in Performance, a consulting company. Johnson's primary focus is in strategic planning, organizational effectiveness, integrated programs, econometric modeling, and performance management.

This sixth edition of the *Flexible Benefits* guide begins appropriately enough with a brief introductory section titled "What Are You Trying to Accomplish?" This section draws upon the attributes mentioned in Fortune's "100 Best Companies to Work For in America," and does a credible job of generally linking the role of a company's benefits structure to those same attributes.

The next section makes the case of the human resources function as a strategic business partner. It posits that HR needs to be transformed into a department that is strategic rather than service-oriented. This section also proposes a revision of the traditional organizational structure (including organizational charts). One interesting suggestion that is the focus of the second half of this section involves the designation of a chief people officer (CPO) to manage all human resources functions, including implementing a total compensation program, establishing performance metrics, measuring and maximizing return on investment in all HR programs. The CPO would also be heavily involved in implementing strategic change in order to sustain a competitive advantage. Many of the same arguments for the establishment of the CPO were analogous to current transformations in risk management, as that industry is similarly examining and defining the role of the chief risk officer (CRO) within the corporate structure.

Section III focuses specifically on the management of workforce health care costs. As with the prior two sections, the presentation up to this point is less operational and more strategic. Johnson provides a number of statistics on the employer cost of health care, and while the numbers are not surprising to those with a specialty in the field, the dollars involved are nonetheless quite sobering. In keeping with the general theme of serving as a benefits handbook, this section provides a very useful template of "best practices" in creating and maintaining a healthy and productive environment. In addition, best practice financial targets are provided to assist HR managers in goal-setting.

Sections IV through VII gradually move into the more specific components that make up the flexible benefits structure. Qualified benefits, taxable benefits, flexible spending accounts (FSA), 401(k) plans, and others enter the discussion about one-third of the way into the book. Costs and savings of employee ownership, and the process for developing flexible benefits are other topics addressed. An extensive laundry list of issues that can be addressed and benefits/perquisites offered by employers in this section illustrates the universe of "entrees" that can be included in what is known by some as cafeteria plans (no mention of pet insurance on the list).

Johnson also mentions the changing demographics of the workforce and a growing emphasis on job satisfaction among younger members of the workforce. This is probably the one area of the book that could have included more extensive coverage. Although *Flexible Benefits* does make a cursory case for implementing a flexible

benefits structure from the corporation's perspective, I believe a more in-depth analysis of changing worker expectations would have made the case more convincingly.

The specific implementation, financing options, and advantages of a wide variety of flex service are presented in a pleasantly readable spreadsheet-type format in Section V. These include such cutting edge benefits as personal insurance, telecommuting accommodations, paid time-off enhancements, concierge-type services, and pre-retirement counseling.

Section VII is written with the employee's perspective in mind. This section in particular would be valuable to an employee with a number of choices regarding flex services and levels. There are a number of worksheets available to compute items such as the level of participation in Health Care and Dependent Care FSAs.

The next section deviates somewhat from the prior ones. It is primarily intended for the human resource professional, as it covers the most important attribute of successful HR implementation—communication. The discussion and suggestions in this section would apply to many communication scenarios that are broader than HR-related situations. Tools discussed include a “know your audience” questionnaire; an analysis of the message and image to be projected; the most effective medium for getting various messages communicated; and the optimal use of focus groups.

The remaining sections go into significantly more detail of specific issues such as credit strategy and pricing. For those with specific interest in FSAs, a section targeted to Safe/Unsafe Harbor tests, enrollment, administration, Special Health FSA tests, and COBRA's impact on flexible benefit programs would be of interest.

Application of the suggestions and concepts tendered by this reference can be found in the last section. Having been involved in over 100 flexible benefits programs, Johnson has ample experience upon which to draw as he provides a case study to illustrate the problems needed to overcome benefits shortcomings. The case involves a scenario where a company facing a significant increase in medical care expenditures needs to make major changes to its benefits program. A step-by-step description of the steps taken to meet the ambitious yet necessary objectives laid out by this company is carefully explained in this section.

True to its intended purpose as a flexible benefits handbook or how-to guide, the final 151 pages of this 378-page handbook consist of a large appendix containing annotated U.S. Tax Code provisions and certain IRS regulations relevant to flexible benefits programs. Fortunately, this publication by the International Foundation of Employee Benefit Plans is as up-to-date in the area of employee benefits as can reasonably be expected. However, noting that this 2002 version is the sixth edition, it is reasonable to assume that *Flexible Benefits* does have a limited shelf life and will probably need to be replaced with more recent editions as they become available.

Overall, this contribution to the objectives and implementation of a flexible benefits program was concisely written. By dividing the handbook into two complementary parts, the book is able to provide content that would be of interest to various audiences with different needs. Therefore, I would consider the book to be of interest to HR professionals (especially those with input into strategic planning). The section on communication would appeal to an even broader audience, including those

employees involved in numerous benefits decisions on a personal basis. From a pedagogical perspective, I believe this volume would make a nice supplement to an undergraduate or graduate employee benefits course. The essence of the book itself was very readable, and Johnson avoided the common temptation of getting mired in regulatory minutiae when discussing benefit structures. The Appendix was useful in filling in the specific regulatory details critical to plan implementation. As consistent with its intent, the book provided a strategic overview of the utilization of flexible benefits within a broader HR program.

Handbook of Management under Uncertainty, edited by Jaime Gil-Aluja, 2001, Kluwer Academic Publishers, New York, NY

Reviewer: Maurizio Pompella, University of Siena

Western science throughout centuries has been constructed taking as one of its unquestionable supports the excluded middle principle [. . .]. A single logical operator allows for the linking of proposals by means of two modes ("ponens" and "tollens"). At the present time and as a consequence of repeatedly stated reasons [. . .], it is not possible to base all research activity on the excluded middle principle. This is the starting point, as stated by the editor, on which this *Handbook* seems to be based. A brief introduction outlines the pattern that is followed in the volume—from the objectivity of reality to the algorithms needed to deal with uncertainty—as well as the principle that inspired the choice of contributors.

The leitmotif of the book featuring a collection of articles is to apply to management science tools used to deal with the uncertainty of economic phenomena, particularly when measurements and objective numerical assignments are not possible. The instruments used are mainly the theory of fuzzy sets and its variations, since they prove "perfectly adequate" to match the situations where objectivity is lacking and subjective estimates are needed in order to make the best use of available data and information. *The theory of the fuzzy sets has been developed to try to solve problems in which the description of the activity and the observations are imprecise, vague, or uncertain. The term "fuzzy" refers to the situation in which well-defined limits for the total of activities or observations do not exist.*

What is the common nexus that inspired this gathering of the authors? An unusual one, as is specified in the circumstance that "their life and work have been carried out and continue to be carried out on the shore of [. . .] the Mediterranean," and the "special way of understanding, explaining and facing reality" characterizing the people who live there, being the reason of their choice. Taken together, the chapters included in the *Handbook*, in fact, seem to be quite heterogeneous, and not always easily readable, as they range from financial aspects of management under uncertainty, to mathematics (formal approach to uncertainty), cost management, accounting, marketing, to resources management, and even to environmental economics. By considering just a few contributions—in a sense—"marginal" to the general design of the work, however, the very comprehensive purpose of producing a review of management problems within a sphere of uncertainty, is nearly achieved.

In the first chapter (*Management Problems in Uncertainty*) the editor, Gil-Aluja, explains how the classical models for business decisions are based on a simplified reality, where quantitative information and data are just presented as *certain* or *random*, although

in most cases they are *uncertain*. If the theory of probability is used to handle *random* data, a special category of models is needed to deal with *uncertain* data, since they cannot be measured, by definition. Thus, the concepts of subjectivity, fuzziness, vagueness, and also assignment and grouping techniques must be taken into account. Having illustrated—superbly—the relationship between imagination and freedom, the importance of perception and thought differences, and the uncertainty that all this produces in the outline of whatever future scenery, the author introduces the “principle of gradual simultaneity” as an evolution of the excluded middle principle, and specifies the difference between randomness and uncertainty. An introduction to the theory of fuzzy subsets and its potential benefit for management ends the chapter.

Crisp and Non-Crisp Hierarchical Systems in Management is the title of the second chapter (Tacu and Stefan). It consists of a formal analysis of the fundamentals of fuzzy sets: definitions, differences between classical (crisp) and fuzzy sets, membership fuzzy function, operations with the fuzzy sets, and it illustrates a series of propositions and theorems related to the fuzzy subsets. Three more paragraphs, dealing with the point of view of the decision maker, follow this section. They go into the method of multicriterial decision that uses the notion of rank to realise a hierarchy, a matrix method using corrective coefficients, and a method to obtain multicriterial hierarchies through matrix games in an orderly manner.

In the chapter that follows (*Classification of Several Business Sectors According to Uncertain Characteristics*) Cassù, Ferrier, and Bonet try to match the traditional analyses for evaluation of share investments (*fundamental* and *technical*) with the mathematics of uncertainty in order to obtain some sort of *expert diversification*. This is a diversification that takes into account objective information as well as the subjectivity ensuing from the evaluation of the uncertainty that a series of experts may provide about individual sectors. The result is—through the construction of the matrices of dissimilarity–similarity—a hierarchical, sector classification of the stock sectors taken into account.

Chapter 4 is the first of the three chapters dedicated to the financial aspects. It deals mainly with MCDA in financial risk management (*Multicriteria Decision Aid in Uncertainty and Financial Risk Management*, Zopounidis and Doumpos). The matter treated here is the decisionmaking process on the hypothesis that multiple, often conflicting, factors have to be considered at the evaluation model. This is not the same, of course, as modeling uncertainty through statistics, probability, and so on (as remarked in the introduction of the volume). Nevertheless, a combination of the two ways of handling the matter would provide an invaluable, integrated support to the decision, as emphasized in the chapter.

The chapter illustrates both the contribution of MCDA to the management of uncertainty and the applicability of MCDA to the field of financial risk management. After an introduction and a brief historical overview, an inventory of the multicriteria decision aid approaches is given (viz., multiobjective programming, multiattribute utility theory, outranking relations, and preference “disaggregation” analysis). Then MCDA approaches are reviewed in the context of uncertainty, and the influence of fuzziness and vagueness is investigated.

The second part of the chapter is devoted, as mentioned above, to the application of MCDA in the management of financial risks, which is described—correctly—as being characterized by the existence of multiple criteria and conflicting situations. Prediction of corporate failure, evaluation of credit card, evaluation of credit risk, portfolio selection, and assessment of country risk, are the proposed examples of MCDA applications.

Many changes have occurred and new techniques have emerged within the sphere of business financial management, so that the current financial reality is characterized by changeability. The challenge is now to adapt the traditional instruments used in accounting and financial statements to the new “realm” of uncertainty. This is the starting point for the fifth chapter (*Financial Analysis in Uncertainty*, Anna Maria Gil-Lafuente). The analysis is developed by treating a series of classical themes of business management: long-term financial solvency, economic and financial risk analysis, break-even point, and cost of capital. After that, the chapter deals with the problem of selecting financial resources and a proper financial structure, as well as the assignment of financial means, and also the attempt to relate the products offered by the market with the financial requirements of the business, through the techniques of multivariate analysis. Then there is a paragraph on each key topic outcome, i.e., the valuation of the business itself, in which the role of subjectivity of estimates is stressed once again. Some classical evaluation criteria are recalled, and the estimates of both interest rates and profits in uncertainty are treated.

An interesting section, about the interactions that affect the business and proceed from the economic as well as the sociocultural sphere, follows and closes the chapter, here some delicate concepts are used to discuss interactions, such as “causality” and relationship between groups of causes and groups of effects, together with indirect or *second-generation* consequences.

The third chapter on financial aspects is the sixth of the book: *Investment Management in Uncertainty* (Terceno, de Andrés, Barberà, and Lorenzana). This is a most technical section, concerned with the financial management of companies, in the broadest sense; this corresponds to setting all the whole financial decisions—investment, financing, and dividend policies—as compatible with the general aims of the business. Again, the focus is on uncertainty and the applications of the fuzzy sets theory. Investment classification and evaluation, as well as decisionmaking (investment decisions) in uncertainty, are dealt with. Then a series of methods for ordering fuzzy numbers follows in order to distinguish and to rank the projects to be accepted, having calculated NPV on the basis of fuzzy cash flow and discount rate.

The last section of the chapter is dedicated to problems that can be solved with traditional linear programming, yet assuming that the coefficients of the linear program are estimated via fuzzy numbers.

The role of ambiguity and vagueness in the human decisionmaking process is also investigated in the seventh chapter (*Accounting and Controlling in Uncertainty: Concepts, Techniques and Methodology*, Casta and Lesage). Now the aim is quite ambitious, for a series of applications of fuzzy sets approach is proposed—which concern accounting, controlling, and auditing—and a series of methodological problems is examined closely.

The relationship between accounting models and imperfect data is addressed first, with the extension of double-entry accountancy to fuzzy numbers. After that, an audit risk evaluation model (nonnumerical approach) is developed and tested to take into account the imperfect information and imperfection of judgment by the auditors. On the other hand, the second part of the chapter is devoted to the effects on the management decisions of the use of imperfect information, and to the cognitive advantage that is obtainable by using this kind of information.

Target Costing and *Quality Function Development* are the essential topics of the chapter that follow (*A Methodology for Building Fuzzy Expert Systems (FES) with Spreadsheet to Quality Function Development (QFD) of the Target Costing*, Lòpez Gonzàles). They are combined with the application of fuzzy theory, the aim of the chapter being that of drawing up a QFD model capable of considering uncertainty. Therefore, a methodology is developed to incorporate fuzzy logic within QFD. The need for a cost management approach is properly described as a result of the new competitive environment, driven by "confrontation strategies."

The first, introductory section of the chapter is concerned with the target costing determination process and its fundamentals; an overview of the QFD process follows (product or service planning, components deployment, process and production planning). Then the fuzzy approach is given. The portion recalled in the title closes the chapter, and illustrates how a fuzzy expert system (FES) may be built with a spreadsheet, in order to approximate target costing and QFD having considered the uncertainty that affects related decisionmaking processes.

Chapter 9, which offers a series of useful opportunities for meditation, concerns the influence of uncertainty and ambiguity—as consequences of complexity—in human resources management and organizational life (*The Management of Human Resources Under Uncertainty and Ambiguity*, Cainarca and Zollo). One of the key concepts developed in the chapter is based—since the management of human resources is a matter of "complexity" ("the new relationships between labor and enterprise can be decoded within the category of complexity")—on the difference between complexity *reducing* and complexity *absorbing*. The authors qualify fuzzy logic as a bridge between the world of weak rationality and the world of procedures. On one hand, strong rationality faces complexity as a managerial issue, and tends to solve problems through a detailed design and planning of the work process. On the other, weak rationality is to abandon the detailed design to deal with the uncertainty and ambiguity accompanying the complexity itself. The result is some sort of "complexity absorption," and delegation to self-organizing activity; and the outcome, in this case, depends on the capability to deal with unpredictable and ambiguous situations—that is, on competency so that the management of human resources becomes a management of competencies.

Reliability of Production Systems, by Gento and Redondo, follows, and is one of the most interesting sections of the volume. It is concerned with the reliability of production devices, and embodies an attempt to treat this matter within the context of fuzzy logic.

The traditional approach to reliability is analyzed, with an inventory of the types of possible failures and a few definitions. A summary of methods for the evaluation of reliability in complex systems is then proposed (reliability graphs, event and fault

trees, and so on), together with an insight into the relevance of the human factor in the reliability of processes. The remaining portion is dedicated to the application of fuzzy sets theory to reliability, according to an approach that is not described as an alternative to the traditional one, but as an option: some sort of *second best*. In other words, a possibility to be exploited when available data are scarce—e.g., the database is not large enough to formulate inference—and there is a strong influence of human factors (a condition of uncertainty deriving from human errors). The chapter ends with a method that is an alternative to the traditional fault trees, mainly based on a different, innovative set of operators.

Chapter 11 deals with marketing and uncertainty, which appear as unconventional matching indeed (*New Ideas on Marketing in Uncertainty*, Jaime Gil Lafuente). Nevertheless, the work has a very plain structure. Five sections deal with marketing, organizational structures (where the theory of fuzzy subsets becomes part of the discussion), creativity, sales forces, and distribution, respectively. Marketing definition and fundamentals open the chapter; behavior of consumers, knowledge of market, commercialization strategies (with the P paradigm—Product, Place, Promotion, and Price) are some of the issues dealt with first. Then, having identified the products both in terms of their characteristics and the markets suitable for their commercialization, the theory of fuzzy subsets and its applications to product grouping is discussed. The basic idea is to describe products by means of fuzzy subsets, and to use them to treat some of the problems arising in ordinary commercial activity.

An “atypical” work, as defined by Gil-Aluja in the introduction, concludes the book. Its title is *Management of Uncertainty in Environmental Problems: An Assessment of Technical Aspects and Policies* (Morabito, Marino, and Ricca). The focus of the research consists of studying (1) the applications of neural networks and “soft computing” to the field of environmental economics, and (2) the ways of handling the complexity related both to environment protection and decisionmaking (as a matter of political intervention against urban pollution).

Once more, the analysis is based on a model that implies the use of numeric and linguistic (quantitative and qualitative) variables at the same time, and therefore the use of fuzzy logic processing tools. Before the case study (the “Villa S. Giovanni Case”), which closes the chapter, a series of topics related to the above-mentioned issues is analyzed. After the illustration of how the problem of urban pollution may be characterized, neural network models, methodologies based on fuzzy logic, time series prediction, externalities, and political interest in environmental issues are discussed. Then there are the concluding remarks, which just emphasize how effective soft regulation policies could be—such as, the imposition of some sort of “ecology tax,” toward compensating environmental damage.

Banking Risk Management in a Globalizing Economy, by Panos Angelopoulos and Panos Mourdoukoutas, 2001 Quorum Books, Westport, Connecticut, London.

Reviewer: Soga Ewedemi, Clarion University of Pennsylvania

The contents of the book indicate familiarity of the author(s) with the working knowledge of the market, its mechanics, and intricacies. It is obvious that in addition to describing available derivative instruments that can be employed to manage risk, and distinguishing one from another, the advantages and disadvantages of some

of the derivatives in specified circumstances were clearly stated. Also, the authors succeeded in presenting the material in a nonthreatening style to readers who are unfamiliar with the subject. However, the book in its present form should be read with care. An adequate effort in editing the current version would enhance the clarity and quality of the book.

In the introductory chapter, the dual objective of the book was clearly enumerated. Angelopoulos and Mourdoukoutas (A&M) set out first to examine the transformation of the banking industry from that of passive intermediation to active asset-liability risk management. Second, they reviewed the conventional on-balance sheet and modern off-balance sheet approaches to managing credit, interest rate, and foreign exchange risks with emphasis on the use of derivatives.

A&M distinguish between traditional and nontraditional banking risks in chapter 2. Liquidity, credit, political, and legal, as well as operation risks are included in the first, while the second is subdivided into market and other risks. They discuss interest rate and foreign exchange risks under market risk, while other risks consist of commodity price, investment portfolio, and financial derivative risks. The authors show that the classification of risk referred to above is not universal. For example, the U.S. Comptroller's Office utilizes nine categories of risk classification: foreign exchange, interest rate, price, liquidity, credit, transaction, compliance, reputation, and strategic. Other classifications include the Federal Reserve Bank's six categories, and the European Union's classification. Chapter 2 also covers duration, gap analysis, convexity, and two aggregate measures of risk, namely, value at risk (VAR) and total risk management (TRM).

In chapter 3, the authors step back to develop the evolution of banking risk management from the period of "multinationalization" to "globalization." Relevant banking legislation, Basle Committee Rules and corresponding European Union (EU) Directives are referred to. The authors describe the financial derivatives in chapter 4, including forwards, futures, options, swaps, caps, floors, collars, and swaptions. Chapters 5, 6, and 7 discuss, respectively, credit risk management, interest rate risk management, and foreign exchange risk management. The final chapter summarizes the content of the book.

It would appear from the organization of the book that the authors had a difficult time deciding if chapter 3 on the evolution of banking risk management should precede or follow chapter 2. It is probable that switching chapters 2 and 3, that is, discussing the evolution of banking risk management before comparing and contrasting the traditional to the nontraditional risks, would have provided for a smoother transition to chapter 4 where the derivatives are described.

The authors point out that for four decades after the Great Depression, the operation of separate national and local markets led to information inefficiencies, and that governments created sanctuaries for separate national markets, thereby providing a low-risk environment for multinational corporations. The government regulations were extended to the banking industry, protecting them from domestic and foreign competition. Reference was made to the long-term relationship between banks and a select group of corporate clients especially in Asian countries, and in particular to the "keiretsu" in Japan, with the resultant interest distortion.

A&M also mention the fact that globalization in eliminating market sanctuaries, compounded “risks and uncertainties, especially financial risks.” With deregulation and liberalization of foreign exchange and domestic money markets came diversification of operations by banks. The spread of information technology lowered the cost of banking services, while at the same time it increased competition. The banking industry realizes that it can no longer rely on just loans but must engage in other activities to survive.

The authors point out that at one time managers relied on personal relationships and knowledge of the corporate client and simplistic credit analysis techniques for assessing the risk exposure. The “relationship” banking, has been replaced by “commodity” banking, giving way to modern risk measurement that “has attracted a great deal of attention from both academia and the consulting industry, which have developed a number of individual and aggregate measures.” The measures include duration, convexity, and FX sensitivity analysis and value at risk (VAR).

As has been indicated earlier, the nonthreatening writing style would benefit readers who are not familiar with the subject. It is possible to acquire a good grasp of the subject by reading the book in its current version. Further editing will, however, minimize the possible confusion that might arise. Many of the problems might be obvious to a careful reader, and can easily be corrected, such as “government regulators, and central bankers” that appear to have strayed to the last line of the first full paragraph on page 3, or “and the maturity” in the last paragraph on page 28. Similarly, the CD amount of \$960,000 on the lower balance sheet figure on page 19 should read \$800,000. The cumulative figures, on the last line of Table 2.3 from time zones “8-30” to “more than three years” appear to be wrong because of the arithmetical error in calculating the deficiency for the “8-30” time zone. These are examples of apparent numerical errors.

Other problems are more troubling. In calculating the liquidity of each zone from the maturity ladder table using the formula given at the bottom of page 24, it is not clear how the ratio will be interpreted for changes in the values of the numerator and denominator, especially if the denominator is negative. What is referred to, as total liquidity ratios at the top of page 26 for zones 8-30 and 31-180 appears to be cumulative deficiency. The summation sign seems to be missing from equation (2) for simple duration. The last two sentences of the second full paragraph on page 63 appear to be contradictory. If, however, there is a difference between the definitions of the two annual rates of return, it should be clarified.

Other problematic observations include the second diagram on page 107, the two numerical examples on page 116, and the numerical illustrations on pages 140-1.

It evident from the foregoing comments that if the book is adopted for a class in its present form, no effort should be spared in ensuring that the required modifications are brought to the attention of students.

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