Modelling Longevity Dynamics For Pensions And Annuity Business Mathematics Texts

The actuarial analysis of social protection schemes is a challenge that requires a delicate balancing act between the demographic, economic, financial, and actuarial fields. Actuarial Practice in Social Security addresses this challenge by providing a practical tool for actuaries to enhance and modernize their social protection systems while still maintaining this important balance. Offering a pragmatic and results-oriented approach, this volume presents technical material on valuation covering a wide-range of risks including old age, survivors, disability, sickness, maternity, employment injury, and unemployment. It offers a comprehensive, global picture of actuarial practice in social security and provides concrete examples of work done by actuaries in the field.

*While not attempting to train readers as professional economists, this book aims to provide a secure grounding in the theory and practice of economics insofar as it deals with pension matters. From reading this book, the user will understand: * The key types of pension scheme * The role of pensions in maximizing individual lifetime welfare * The role of pensions in individual savings and retirement decisions * The role and consequences of the pension plan from the company's viewpoint * The role of pensions in promoting aggregate savings * The role of pensions and retirement in overlapping generations models * The economics of ageing and intergenerational accounting * The social welfare implications of pensions * The lessons of behavioural economics for pensions*

"The ongoing COVID-19 pandemic marks the most significant, singular global disruption since World War II, with health, economic, political, and security implications that will ripple for years to come." -Global Trends 2040 (2021) Global Trends 2040-A More Contested World (2021), released by the US National Intelligence Council, is the latest report in its series of reports starting in 1997 about megatrends and the world's future. This report, strongly influenced by the COVID-19 pandemic, paints a bleak picture of the future and describes a contested, fragmented and turbulent world. It specifically discusses the four main trends that will shape tomorrow's world: - Demographics-by 2040, 1.4 billion people will be added mostly in Africa and South Asia. - Economics-increased government debt and concentrated economic power will escalate problems for the poor and middleclass. - Climate-a hotter world will increase water, food, and health insecurity. - Technology-the emergence of new technologies could both solve and cause problems for human life. Students of trends, policymakers, entrepreneurs, academics, journalists and anyone eager for a glimpse into the next decades, will find this report, with colored graphs, essential reading.

This book, adopting machine learning techniques for the financial planning field, explores the demand for life insurance as seen in previous literature and both estimates and predicts the demand for the adoption of life insurance using these techniques. Previous studies used diverse perspectives, like actuarial and life span, in order to understand the demand for life insurance, though these approaches have shown inconsistent findings. Employing two theoretical backgrounds—ecological systemic theory and artificial intellectual methodology—this book explores a better estimation and a prediction of the demand for life insurance and will be of interest to academics and students of insurance, financial planning, and risk management.

Implications for pension funds and annuity providers

Neural Advances in Processing Nonlinear Dynamic Signals

Public Private Partnerships

Financial Models for Pension Annuities and Life Insurance

New Models for Managing Longevity Risk

A More Contested World

Disability insurance, long-term care insurance, and critical illness cover are becoming increasingly important in developed countries as the problems of demographic aging come to the fore. The private sector insurance industry is providing solutions to problems resulting from these pressures and other demands of better educated and more prosperous

This book summarizes the state of the art in generalized linear models (GLMs) and their various extensions: GAMs, mixed models and credibility, and some nonlinear variants (GNMs). In order to deal with tail events, analytical tools from Extreme Value Theory are presented. Going beyond mean modeling, it considers volatility modeling (double GLMs) and the general modeling of location, scale and shape parameters (GAMLSS). Actuaries need these advanced analytical tools to turn the massive data sets now at their disposal into opportunities. The exposition alternates between methodological aspects and case studies, providing numerical illustrations using the R statistical software. The technical prerequisites are kept at a reasonable level in order to reach a broad readership. This is the first of three volumes entitled Effective Statistical Learning Methods for Actuaries. Written by actuaries for actuaries, this series offers a comprehensive overview of insurance data analytics with applications to P&C, life and health insurance. Although closely related to the other two volumes, this volume can be read independently.

Countries around the world are increasingly relying on individual pension savings accounts to provide income in old age for their citizens. Although these funds have now been in place for several decades, their performance is usually measured using methods that are not meaningful in relation to this long-term objective. The recent global financial crisis has highlighted the need to develop better performance evaluation methods that are consistent with the retirement income objective of pension funds. Compiling research derived from a partnership among the World Bank, the Organisation for Economic Co-operation and Development (OECD), and three private partners, 'Evaluating the Financial Performance of Pension Funds' discusses the theoretical basis and key implementation issues related to the design of performance benchmarks based on life-cycle savings and investment principles. The book begins with an evaluation of the financial performance of funded pension systems using the standard mean variance framework. It then provides a discussion of the limitations inherent to applying these methods to pension funds and outlines the many other issues that should be addressed in developing more useful and meaningful performance measures through the formulation of pension-specific benchmark portfolios. Practical implementation issues are addressed through empirical examples of how such benchmarks could be developed. The book concludes with commentary and observations from several noted pension experts about the need for a new approach to performance measurement and the impact of the recent global financial crisis on pension funds.

Chapter 1: Interregional Transfers through Public Pension in Canada- In this chapter, I build a regional computable general equilibrium model with an overlapping generations (OLG) structure of the Canadian economy to analyze population aging dynamics and public pensions. Canada is divided into three regions: Atlantic, Quebec and Rest of Canada (ROC). The impact of population aging is investigated on each of three regions' pension systems. The results confirm that as a result of aging all regions are affected negatively if they choose to have an independent pension system. Under a joint pension system most of the pressure of the provision of the pension system is on the ROC. Atlantic region benefits the most from a joint pension plan as the implicit funds ow from ROC to Atlantic region. Quebec benefits from having its own program, but the benefits disappear slowly in future years. Chapter 2:

Age-Variable Rate of Time Preference in CGE-OLG Model- Contrary to the mainstream studies in the area of intertemporal optimization that assume a constant rate of time preference over individuals' life cycles, in this chapter I propose a new approach to measure the rate of time preference by assuming that the rate of time preference evolves by age. I construct an overlapping generations model (OLG) and calibrate rate of time preference. The age-variable rate of time preference would permit to capture many other elements that affect the life cycle profile of consumption as observed in the data. The results show that rate of time preference exhibits three phases and is different for young versus old. Chapter 3: Computing Demographic Change Simulation under Constant and Age-variable Rate of Time Preference - This chapter simulates the impact of an aging population on various macroeconomic variables and calculates the cohort welfare as well as social welfare. The outcomes from simulations are dependent on the choice of rate of time preference as well as the structure of the model. The results in this chapter provide a new approach to determining the impact of aging population. The choice of a realistic rate of time preference, which allows its variability by age, affects the cohort welfare noticeably.
Interest Rate Models
Weather Derivative Valuation
Life Insurance in Europe
The Calculus of Retirement Income
Reforming Pensions: Principles and Policy Choices
Introduction to Insurance Mathematics
Older Americans, even the oldest, can now expect to live years longer than those who reached the same ages even a few decades ago. Although survival has improved for all racial and ethnic groups, strong differences persist, both in life expectancy and in the causes of disability and death at older ages. This book examines trends in mortality rates and selected causes of disability (cardiovascular disease, dementia) for older people of different racial and ethnic groups. The determinants of these trends and differences are also investigated, including differences in access to health care and experiences in early life, diet, health behaviors, genetic background, social class, wealth and income. Groups often neglected in analyses of national data, such as the elderly Hispanic and Asian Americans of different origin and immigrant generations, are compared. The volume provides understanding of research bearing on the health status and survival of the fastest-growing segment of the American population.
Originally published in 2005, Weather Derivative Valuation covers all the meteorological, statistical, financial and mathematical issues that arise in the pricing and risk management of weather derivatives. There are chapters on meteorological data and data cleaning, the modelling and pricing of single weather derivatives, the modelling and valuation of portfolios, the use of weather and seasonal forecasts in the pricing of weather derivatives, arbitrage pricing for weather derivatives, risk management, and the modelling of temperature, wind and precipitation. Specific issues covered in detail include the analysis of uncertainty in weather derivative pricing, time-series modelling of daily temperatures, the creation and use of probabilistic meteorological forecasts and the derivation of the weather derivative version of the Black-Scholes equation of mathematical finance. Written by consultants who work within the weather derivative industry, this book is packed with practical information and theoretical insight into the world of weather derivative pricing.
As pension fund systems decrease and dependency ratios increase, risk management is becoming more complex in public and private pension plans. Pension Fund Risk Management: Financial and Actuarial Modeling sheds new light on the current state of pension fund risk management and provides new technical tools for addressing pension risk from an integrated point of view. Divided into four parts, the book first presents the correct measurement of risk in pension funds, fund dynamics under a performance-oriented arrangement, an attribution model for monitoring the performance and risk of a defined benefit (DB) pension fund, and an optimal investment problem of a defined contribution (DC) pension fund under inflationary risk. It also describes a pension plan from a dynamic optimization viewpoint, the optimal asset allocation of U.S. pension funds, the identification of stakeholders' risks, value-at-risk (VaR) methodology, and various effects on the asset allocation of DB pension schemes. The second section focuses on the effects of uncertainty on employer-provided DB private pension plan liabilities; wage-based lump sum payments by death, retirement, or dismissal by the employer; fundamental retirement changes; occupational pension insurance in Germany; and longevity risk securitization in pension schemes. In the third part, the book examines employers' risks, accountability rules and regulations, useful actuarial analysis instruments, risk-based solvency regime in the Netherlands, and the impact of the 2008 global financial crisis on pension participants. The final part covers DB pension freezes and terminations of plans, the two-pillar social security system of Italy, the Greek social security system, the effect of a company's unfunded pension liabilities on its stock market valuation, and the returns of Spanish balanced pension plans and portfolio performance. With contributions from well-known, international academics and professionals, this book will assist pension fund executives, risk managers, consultants, and academic researchers in attaining a clear picture of the integration of risks in the pension world. It offers a comprehensive, contemporary account of how to handle the risks involved with pension funds.
This 2006 book introduces and develops the basic actuarial models and underlying pricing of life-contingent pension annuities and life insurance from a unique financial perspective. The ideas and techniques are then applied to the real-world problem of generating sustainable retirement income towards the end of the human life-cycle. The role of lifetime income, longevity insurance, and systematic withdrawal plans are investigated in a parsimonious framework. The underlying technology and terminology of the book are based on continuous-time financial economics by merging analytic laws of mortality with the dynamics of equity markets and interest rates. Nonetheless, the book requires a minimal background in mathematics and emphasizes applications and examples more than proofs and theorems. It can serve as an ideal textbook for an applied course on wealth management and retirement planning in addition to being a reference for quantitatively-inclined financial planners.
Racial and Ethnic Differences in the Health of Older Americans
Infectious Diseases in Primates
Longevity Risk and Retirement Income Planning

Effective Statistical Learning Methods for Actuaries I
The Inverting Pyramid
Actuarial Models for Disability Insurance
Old age income support will be one of the biggest social and economic challenges facing Asia in the twenty-first century. The growing spotlight on old age income support is largely due to exceptionally rapid population aging which is fundamentally reshaping Asia's demographic profile. A young continent reaping the demographic dividend of a large youthful workforce is giving way to a greying continent where the ratio of retirees to workers is on the rise. In contrast to industrialized countries, most Asian countries do not yet have mature, well-functioning pension systems. As a result, they are ill prepared to provide economic security for the large number of retirees who loom on the region's horizon. This book takes a close look at the pension systems of eight countries in East and Southeast Asia – namely, China, Indonesia, Korea, Malaysia, Philippines, Singapore, Thailand and Vietnam – which encompass a wide range of income and development levels. The book provides a comprehensive overview of pension systems in the eight countries, including an in-depth diagnosis to identify their major weaknesses and shortcomings. On the basis of the diagnosis, the book sets forth concrete and specific policy options for reforming Asia's pension systems. Many policy options for reform are country-specific. For example, a top priority in China is to extend the pension system to rural areas. At the same time, a number of reforms – such as the need to extend coverage – resonate across the entire region. Appropriate reform will enable the region's pension systems to deliver affordable, adequate and sustainable old-age economic security.
International Academic Conference on Management, Economics and Marketing in Bratislava, Slovakia 2016 (IAC-MEM 2016), Wednesday - Thursday, July 6 - 7, 2016
Europe's pension systems –among the most celebrated features of its social welfare model— face tremendous challenges. With only 11 percent of the world's population, Europe spends about 60 percent of global outlays on social protection, largely in pensions. In many countries, pension rules have encouraged people to retire sooner, while enjoying longer lives. Payroll taxes on a continuously expanding contributory base have financed these benefits. This model of pension provision is now being severely tested as pension systems reach maturity, while the population is aging and the labor force is starting to shrink. Measures to enable a continued tradition of providing old age security will include • raising retirement ages such that pensions are provided in the last 15 years of life, when work capacity traditionally diminishes • encouraging immigration to help fill the declining work force • rationalizing pension spending, putting priority on preventing old age poverty, and • encouraging savings to help provide the more comfortable retirement that individuals have come to expect. Some measures may be more appropriate in particular countries than others, yet undertaking all of them will likely require less drastic changes in any one of them. The specific choices will need to be discussed and agreed among each country's own population, and be accompanied by enabling changes in pension policy, tax policy, financial markets policy, and labor policy. The fundamental issue is that, with these changes, the important achievements of European social policy can withstand the demographic onslaught and continue to provide old age security for generations to come.
This comprehensive examination of pension systems in OECD and selected non-OECD countries looks at recent trends in retirement and working at older ages, evolving life expectancy, design of pension systems, pension entitlements, and private pensions before providing a series of country profiles.
An Aging World
Mortality Assumptions and Longevity Risk Implications for pension funds and annuity providers
Pension Fund Risk Management
Investment Governance for Fiduciaries
Financial Economics
The Demand for Life Insurance
Longevity at older ages is likely to continue to rise in the medium and longer term. This volume explores how the private and public sectors can collaborate via public-private partnerships (PPPs) to develop new mechanisms to reduce older people's risk of outliving their assets in later life.
"Luca Albertini and Pauline Barrieu are to be congratulated on this volume. Written in a period where structured projects in finance are having a difficult time, it is worthwhile to return to the cradle of securitisation: insurance. Spread out over three parts (life, non- life, and tax and regulatory issues) the 26 chapters, written mainly by practitioners, give an excellent overview of this challenging field of modern insurance. Methodology and examples nicely go hand in hand. The overall slant being towards actual analyses of concrete products. No doubt this book will become a milestone going forward for actuarial students, researchers, regulators and practitioners alike." —Paul Embrechts, Professor of Mathematics and Director of RiskLab, ETH Zurich The convergence of insurance with the capital markets has opened up an alternative channel for insurers to transfer risk, raise capital and optimize their regulatory reserves as well as offering institutions a source of relatively liquid investment with limited correlation with other exposures. One of the financial instruments allowing for the cession of insurance-related risks to the capital markets is Insurance-Linked Securities (ILS). This book provides hands-on information essential for market participants, drawing on the insights and expertise of an impressive team of international market players, representing the various aspects and perspectives of this growing sector. The book presents the state of the art in Insurance-Linked Securitization, by exploring the various roles for the different parties involved in the transactions, the motivation for the transaction sponsors, the potential inherent pitfalls, the latest developments and transaction structures and the key challenges faced by the market. The book is organized into parts, each covering a specific topic or sector of the market. After a general overview of the ILS market, the Insurance-Linked Securitization process is studied in detail. A distinction is made between non-life and life securitization, due to the specificities of each sector. The process and all the actors involved are identified and considered in a comprehensive and systematic way. The concepts are first looked at in a general way, before the analysis of relevant case studies where the ILS technology is applied. Particular focus is given to: the key stages in both non-life and life securitizations, including the general features of the transactions, the cedant's perspectives, the legal issues, the rating methodologies, the choice of an appropriate trigger and the risk modeling, the particular challenges related to longevity securitization, the investor's perspective and the question of the management of a portfolio of ILS, the general issues related to insurance-linked securitization, such as accounting and tax issues, regulatory issues and solvency capital requirements. The book is accompanied by a website www.wiley.com/go/albertinibarrieuILS which will feature updates and additions to the various contributions to follow market developments.
The individual account-based but unfunded approach to mandated public pension systems is a reform benchmark for all pension schemes, promising fair and financially sustainable benefits. Nonfinancial defined contribution (NDC) pension schemes originated in Italy and Sweden in the 1990s, were then adopted by Latvia, Norway, and Poland, envisaged but not implemented in various other countries, such as Egypt and Russia, and remain under discussion in many nations around the world, such as China and France. In its complete form, the approach also comprises budget-financed basic income provisions

and mandated or voluntary funded provisions. Volume 1 of this book offers an assessment of countries that were early adopters before addressing key aspects of policy implementation and design review, including how best to combine basic income provisions with an NDC scheme, how to deal with heterogeneity in longevity, and how to adjust NDC scheme design and labor market policies to deliver on reform expectations. Volume 2 addresses a second set of issues, including the gender pension gap and what family policies can do about it within the NDC framework, labor market issues and administrative challenges of NDC schemes and how countries are coping, the role of communication in these pension schemes, the complexity of cross-border pension taxation, and much more. Progress and Challenges of Nonfinancial Defined Contribution Pension Schemes is the third in a series of books analyzing the progress, challenges, and adjustment options of this reform revolution for mandated public pension systems. 'Pension reform is a major issue in many countries. The development of the nonfinancial defined contribution pension plan in the 90's was a major advance in pension design. By reporting actual country experiences and exploring properties of plan designs, this latest collection of essays is a valuable contribution, well worth reading.' Peter Diamond Professor at Massachusetts Institute of Technology; 2010 winner of the Nobel Memorial Prize in Economic Sciences 'A highly stimulating publication for policy makers and researchers alike. It pushes the analytical frontier for policy challenges that all public pension schemes are confronted with but that the nonfinancial defined contribution approach promises to handle best.' Noriyuki Takayama President, Research Institute for Policies on Pension and Aging, Tokyo, and professor emeritus, Hitotsubashi University, Tokyo 'In a changing world where pensions are more than ever linked to labor markets, communication tools, and flexibility considerations, this anthology provides a unique up-to-date analysis of nonfinancial defined contribution pension schemes. By mixing international experiences and theoretical studies, it demonstrates the high adaptability of such pension schemes to changing social challenges.' Pierre Devolder Professor of Finance and Actuarial Sciences, Catholic University of Louvain, Belgium

1. Questions, Terminology, and Underlying Principles2. Diversity and Characteristics of Primate Parasites3. Primate Socioecology and Disease Risk- Predictions and Rationale4. Host-Parasite Dynamics and Epidemiological Principles5. Host Defenses- The Immune System and Behavioral Counterstrategies6. Infectious Disease and Primate Social Systems7. Parasites and Primate Conservation8. From Nonhuman Primates to Human Health and Evolution9. Concluding Remarks and Future Directions

Technical and Financial Features of Risk Transfers

Global Trends 2040

Financial and Actuarial Modeling

Transatlantic Dialogue

Developments in Demographic Forecasting

The Role of Pension System Design in an Aging World

While some social scientists may argue that we have always been networked, the increased visibility of networks today across economic, political, and social domains can hardly be disputed. Social networks fundamentally shape our lives and social network analysis has become a vibrant, interdisciplinary field of research. In The Oxford Handbook of Social Networks, Ryan Light and James Moody have gathered forty leading scholars in sociology, archaeology, economics, statistics, and information science, among others, to provide an overview of the theory, methods, and contributions in the field of social networks. Each of the thirty-three chapters in this Handbook moves through the basics of social network analysis aimed at those seeking an introduction to advanced and novel approaches to modeling social networks statistically. They cover both a succinct background to, and future directions for, distinctive approaches to analyzing social networks. The first section of the volume consists of theoretical and methodological approaches to social networks, such as visualization and network analysis, statistical approaches to networks, and network dynamics. Chapters in the second section outline how network perspectives have contributed substantively across numerous fields, including public health, political analysis, and organizational studies. Despite the rapid spread of interest in social network analysis, few volumes capture the state-of-the-art theory, methods, and substantive contributions featured in this volume. This Handbook therefore offers a valuable resource for graduate students and faculty new to networks looking to learn new approaches, scholars interested in an overview of the field, and network analysts looking to expand their skills or substantive areas of research.

Modelling Longevity Dynamics for Pensions and Annuity BusinessOxford University Press

A text aimed at researchers and postgraduates actuarial science, statistics, and actuarial mathematics providing a comprehensive and detailed description of statistical methods for projecting mortality, and an extensive discussion of some important issues concerning the longevity risk in the area of life annuities and pension benefits.

Mortality improvements, uncertainty in future mortality trends and the relevant impact on life annuities and pension plans constitute important topics in the field of actuarial mathematics and life insurance techniques. In particular, actuarial calculations concerning pensions, life annuities and other living benefits (provided, for example, by long-term care insurance products and whole life sickness covers) are based on survival probabilities which necessarily extend over a long time horizon. In order to avoid underestimation of the related liabilities, the insurance company (or the pension plan) must adopt an appropriate forecast of future mortality. Great attention is currently being devoted to the management of life annuity portfolios, both from a theoretical and a practical point of view, because of the growing importance of annuity benefits paid by private pension schemes. In particular, the progressive shift from defined benefit to defined contribution pension schemes has increased the interest in life annuities with a guaranteed annual amount. This book provides a comprehensive and detailed description of methods for projecting mortality, and an extensive introduction to some important issues concerning longevity risk in the area of life annuities and pension benefits. It relies on research work carried out by the authors, as well as on a wide teaching experience and in CPD (Continuing Professional Development) initiatives. The following topics are dealt with: life annuities in the framework of post-retirement income strategies; the basic mortality model; recent mortality trends that have been experienced; general features of projection models; discussion of stochastic projection models, with numerical illustrations; measuring and managing longevity risk.

Progress and Challenges of Nonfinancial Defined Contribution Pension Schemes

With Applications to Investments, Insurance, and Pensions
The Meteorological, Statistical, Financial and Mathematical Foundations
Personal Injury and Wrongful Death Damages Calculations
Overview and Reform Directions

Worldwide life expectancy has increased and, as such, this book examines different aspects of aging from societal and political perspectives. Written by reputable academics working at universities around the world (Australia, New Zealand, Portugal, Taiwan, Tanzania, Russia), this book takes a kaleidoscope view of how different societies handle their aging population.

This second edition expands the first chapters, which focus on the approach to risk management issues discussed in the first edition, to offer readers a better understanding of the risk management process and the relevant quantitative phases. In the following chapters the book examines life insurance, non-life insurance and pension plans, presenting the technical and financial aspects of risk transfers and insurance without the use of complex mathematical tools. The book is written in a comprehensible style making it easily accessible to advanced undergraduate and graduate students in Economics, Business and Finance, as well as undergraduate students in Mathematics who intend starting on an actuarial qualification path. With the systematic inclusion of practical topics, professionals will find this text useful when working in insurance and pension related areas, where investments, risk analysis and financial reporting play a major role.

The past 50 years have seen an abundance of research on retirement planning and longevity risk. Reviewed here is the academic side of the research and its varied viewpoints and nuances. The evolution of retirement risk models, retirement portfolio problems and solutions, and annuities are some of the many topics covered.

The publication assess how pension funds, annuity providers such as life insurance companies, and the regulatory framework incorporate future improvements in mortality and life expectancy.

Pension Systems and Old-Age Income Support in East and Southeast Asia

Behavior, Ecology and Evolution

The Future of Saving

The Oxford Handbook of Social Networks

Assessing Knowledge of Retirement Behavior

OECD and G20 Indicators

Provides statistical information on the worldwide population of people 65 years old or older.

This open access book presents new developments in the field of demographic forecasting, covering both mortality, fertility and migration. For each component emerging methods to forecast them are presented. Moreover, instruments for forecasting evaluation are provided. Bayesian models, nonparametric models, cohort approaches, elicitation of expert opinion, evaluation of probabilistic forecasts are some of the topics covered in the book. In addition, the book is accompanied by complementary material on the web allowing readers to practice with some of the ideas exposed in the book. Readers are encouraged to use this material to apply the new methods to their own data. The book is an important read for demographers, applied statisticians, as well as other social scientists interested or active in the field of population forecasting. Professional population forecasters in statistical agencies will find useful new ideas in various chapters.

Governance is a word that is increasingly heard and read in modern times, be it corporate governance, global governance, or investment governance. Investment governance, the central concern of this modest volume, refers to the effective employment of resources—people, policies, processes, and systems—by an individual or governing body (the fiduciary or agent) seeking to fulfil their fiduciary duty to a principal (or beneficiary) in addressing an underlying investment challenge. Effective investment governance is an enabler of good stewardship, and for this reason it should, in our view, be of interest to all fiduciaries, no matter the size of the pool of assets or the nature of the beneficiaries. To emphasize the importance of effective investment governance and to demonstrate its flexibility across organization type, we consider our investment governance process within three contexts: defined contribution (DC) plans, defined benefit (DB) plans, and endowments and foundations (E&Fs). Since the financial crisis of 2007-2008, the financial sector's place in the economy and its methods and ethics have (rightly, in many cases) been under scrutiny. Coupled with this theme, the task of investment governance is of increasing importance due to the sheer weight of money, the retirement savings gap, demographic trends, regulation and activism, and rising standards of behavior based on higher expectations from those fiduciaries serve. These trends are at the same time related and self-reinforcing. Having explored the why of investment governance, we dedicate the remainder of the book to the question of how to bring it to bear as an essential component of good fiduciary practice. At this point, the reader might expect investment professionals to launch into a discussion about an investment process focused on the best way to capture returns. We resist this temptation. Instead, we contend that achieving outcomes on behalf of beneficiaries is as much about managing risks as it is about capturing returns—and we mean "risks" broadly construed, not just fluctuations in asset values.

"This is by far the best book I've read on the science of aging."—Andrew Weil, M.D. "Life-span Truth Will Set You Free from Age-old Worries," announced the Chicago Tribune upon the first publication of this book. The New England Journal of Medicine confirmed, "For readers interested in aging and longevity, this small book clearly explains the major concepts...extremely enjoyable to read." From NBC Nightly News with Tom Brokaw to Scientific American to the New York Times, S. Jay Olshansky and Bruce A. Carnes have stirred up controversy and brought clarity to an issue often muddled by exaggeration and pseudoscience. Medical science has uncovered a host of answers to the problems of aging, but many of the most exciting discoveries are buried in scientific journals or overshadowed by popular quick-fix treatments. The Quest for Immortality explains the real science of aging and shows

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which treatments offered by today's multi-billion-dollar anti-aging industries offer real hope, and which are a waste of money and time.
An Introduction
Modelling Longevity Dynamics for Pensions and Annuity Business
Dynamic Ecological Systemic Theory Using Machine Learning Techniques
GLMs and Extensions
Proceedings of IAC-MEM 2016 in Bratislava
2001
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Mandatory pensions are a worldwide phenomenon. However, with fixed contribution rates, monthly benefits, and retirement ages, pension systems are not consistent with three long-run trends: declining mortality, declining fertility, and earlier retirement. Many systems need reform. This book gives an extensive nontechnical explanation of the economics of pension design. The theoretical arguments have three elements: * Pension systems have multiple objectives--consumption smoothing, insurance, poverty relief, and redistribution. Good policy needs to bear them all in mind. * Good analysis should be framed in a second-best context-- simple economic models are a bad guide to policy design in a world with imperfect information and decision-making, incomplete markets and taxation. * Any choice of pension system has risk-sharing and distributional consequences, which the book recognizes explicitly. Barr and Diamond's analysis includes labor markets, capital markets, risk sharing, and gender and family, with comparison of PAYG and funded systems, recognizing that the suitable level of funding differs by country. Alongside the economic principles of good design, policy must also take account of a country's capacity to implement the system. Thus the theoretical analysis is complemented by discussion of implementation, and of experiences, both good and bad, in many countries, with particular attention to Chile and China.

Focuses on litigation damages, economic and non-economic, including punitive damages; their definitions, calculations, and assignments in the US and EU. This book examines areas of convergence and divergence in the academic and practical treatment of damages issues in the US and EU.

This book brings together in one volume what researchers have learned about workers, employers, and retirees that is important for formulating retirement income policies. As the U.S. population ages, there is increasing uncertainty about the solvency of the Social Security and Medicare systems and the adequacy of private pensions to provide for people's retirement needs. The volume covers such critical behaviors as workers' decisions to retire, people's choices of saving over consumption, and employers' decisions about hiring older workers and providing pension and health care benefits. Also covered are trends in mortality, health status, and health care costs that are key to projecting the likely costs and effects of alternative retirement income security policies and a strategy for combining data and research knowledge into a policy modeling framework.

The field of financial mathematics has developed tremendously over the past thirty years, and the underlying models that have taken shape in interest rate markets and bond markets, being much richer in structure than equity-derivative models, are particularly fascinating and complex. This book introduces the tools required for the arbitrage-free modelling of the dynamics of these markets. Andrew Cairns addresses not only seminal works but also modern developments. Refreshingly broad in scope, covering numerical methods, credit risk, and descriptive models, and with an approachable sequence of opening chapters, Interest Rate Models will make readers--be they graduate students, academics, or practitioners--confident enough to develop their own interest rate models or to price nonstandard derivatives using existing models. The mathematical chapters begin with the simple binomial model that introduces many core ideas. But the main chapters work their way systematically through all of the main developments in continuous-time interest rate modelling. The book describes fully the broad range of approaches to interest rate modelling: short-rate models, no-arbitrage models, the Heath-Jarrow-Morton framework, multifactor models, forward measures, positive-interest models, and market models. Later chapters cover some related topics, including numerical methods, credit risk, and model calibration. Significantly, the book develops the martingale approach to bond pricing in detail, concentrating on risk-neutral pricing, before later exploring recent advances in interest rate modelling where different pricing measures are important.

Three Essays on Modeling Aging Population
Pension Economics
Evaluating the Financial Performance of Pension Funds
Risk Analysis and Market Challenges
Volume 2. Addressing Gender, Administration, and Communication
Actuarial Practice in Social Security
This book proposes neural networks algorithms and advanced machine learning techniques for processing nonlinear dynamic signals such as audio, speech, financial signals, feedback loops, waveform generation, filtering, equalization, signals from arrays of sensors, and perturbations in the automatic control of industrial production processes. It also discusses the drastic changes in financial, economic, and work processes that are currently being experienced by the computational and engineering sciences community. Addresses key aspects, such as the integration of neural algorithms and procedures for the recognition, the analysis and detection of dynamic complex structures and the implementation of systems for discovering patterns in data, the book highlights the commonalities between computational intelligence (CI) and

information and communications technologies (ICT) to promote transversal skills and sophisticated processing techniques. This book is a valuable resource for a. The academic research community b. The ICT market c. PhD students and early stage researchers d. Companies, research institutes e. Representatives from industry and standardization bodies

This book examines the challenges for the life insurance sector in Europe arising from new technologies, socio-cultural and demographic trends, and the financial crisis. It presents theoretical and applied research in all areas related to life insurance products and markets, and explores future determinants of the insurance industry's development by highlighting novel solutions in insurance supervision and trends in consumer protection. Drawing on their academic and practical expertise, the contributors identify problems relating to risk analysis and evaluation, demographic challenges, consumer protection, product distribution, mortality risk modeling, applications of life insurance in contemporary pension systems, financial stability and solvency of life insurers. They also examine the impact of population aging on life insurance markets and the role of digitalization. Lastly, based on an analysis of early experiences with the implementation of the Solvency II system, the book provides policy recommendations for the development of life insurance in Europe.

Financial science, both quantitative and behavioral, can be used to improve the retirement planning effort. Despite a vast amount of literature on the topic, Secure Retirement recognizes the need to validate this knowledge and develop a comprehensive framework for investors.

This SDN explores how demographic changes have affected and will affect public and private sector savings, highlighting the interaction between pension systems, labor markets, and demographic variables.

Pension Systems Facing Demographic Challenges in Europe and Central Asia

The Handbook of Insurance-Linked Securities

The Quest for Immortality: Science at the Frontiers of Aging

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