How Persistent Low Returns Will Shape
How Persistent Low Returns Will Shape Saving and Retirement

EDITED BY

Robert Clark,
Raimond Maurer, and
Olivia S. Mitchell
Preface

Financial market developments over the past decade have undermined what was once thought to be conventional wisdom about saving, investment, and retirement spending. Foremost among these is the depressingly persistent and extended period of low capital market returns, driving concerns about how to rethink saving and investments in what can be called the ‘new normal.’ Given this challenging backdrop, our new volume in the Pension Research Council/Oxford University Press series identifies several new tools which retirement savers and pension managers will want to explore. The volume will also interest researchers and employers seeking to design better retirement plan offerings.

In preparing this book, many people and institutions have played key roles. Co-editors Robert Clark and Raimond Maurer provided many helpful suggestions as we structured and helped revise the analysis presented herein. We remain grateful to our Advisory Board and Members of the Pension Research Council for their intellectual and research support. Additional support was received from the Pension Research Council, the Boettner Center for Pensions and Retirement Research, and the Ralph H. Blanchard Memorial Endowment at the Wharton School of the University of Pennsylvania. We also offer deep gratitude to Oxford University Press, which publishes our series on global retirement security. The manuscript was expertly prepared and carefully edited by Joseph Brucker and Lauren Sukovich.

Our work at the Pension Research Council and the Boettner Center for Pensions and Retirement Security of the Wharton School of the University of Pennsylvania has focused on aspects of pensions and retirement well-being over 60 years. This volume contributes to our mission, which is to generate research on and engage debate around policy for global pensions and retirement security.

Olivia S. Mitchell
Executive Director, Pension Research Council
Director, Boettner Center for Pensions and Retirement Research
The Wharton School, University of Pennsylvania
Contents

List of Figures ix
List of Tables xiii
Notes on Contributors xv

1. How Persistent Low Returns Will Shape Saving and Retirement 1
   Robert Clark, Raimond Maurer, and Olivia S. Mitchell

Part I. Origins and Consequences of a Persistent Low Return Environment

   Peter Conti-Brown

3. Low Returns and Optimal Retirement Savings 26
   David Blanchett, Michael Finke, and Wade Pfau

   Daniel W. Wallick, Daniel B. Berkowitz, Andrew S. Clarke, Kevin J. DiCiurcio, and Kimberly A. Stockton

5. Investing for Retirement in a Low Returns Environment: Making the Right Decisions to Make the Money Last 61
   Catherine Reilly and Alistair Byrne

   Antti Ilmanen and Matthew Rauseo

Part II. Whither Retirement Strategies?

7. Challenges and Opportunities of Living and Working Longer 101
   Joseph F. Quinn and Kevin E. Cahill

   Vanya Horneff, Raimond Maurer, and Olivia S. Mitchell
viii Contents

9. Retirement Saving and Decumulation in a Persistent Low-Return Environment
   Jason J. Fichtner and Jason S. Seligman 132

Part III. New Designs for Pension Plan Sponsors

10. Helping Employers Become Age-ready
    Yvonne Sonsino 165

    William G. Gale and David C. John 173

12. Global Developments in Employee Benefits
    Natalia Garabato, Jonathan Gardner, and Steve Nyce 194
List of Figures

2.1 Ten-year Treasury constant maturity rate
3.1 Average cost of purchasing $1,000 in ten-year Treasury income, dividends, and corporate earnings
3.2 Cost of funding retirement income to various ages with a $1 million bond ladder
3.3 Optimal spending by expected real portfolio return and legacy goal
3.4 Income replacement rates and legacy goal
3.5 Total savings required to fund lifetime spending goal at retirement by legacy goal
3.6 Differences in life expectancies by household income for a 65-year old man and woman
3.7 The cost of buying $1 in real annuity income at age 65 over time
A3.1 The Spending Smile: lifetime real income target for various spending levels
A3.2 Earnings curves at various income percentiles
4.1 The impact of annual contributions on funded ratios
4.2 The efficient frontier for a portfolio of global equities and global fixed income
4.3 Even successful funds had multiple periods of underperformance: distribution of 552 funds that outperformed their index, 2000–2014
4.4 Manager dispersion with private alternative investments is significantly higher than with traditional asset classes
5.1 Ten-year Expected Returns from the Society of Professional Forecasters
5.2 Expected replacement rate by current age of participant and retirement age, 9 percent contribution rate
5.3 Getting to a 70-percent replacement rate: different strategies by earnings groups
5.4 Required defined contribution rates to achieve 70-percent replacement rate target, by earnings group and retirement age
5.5 Expected DC replacement rates for individuals starting to save at 45 or 55 and working until 65 or 70 by contribution rate
x List of Figures

5.6 Expected total replacement rate for a medium earner who started saving at age 45, by retirement age and contribution rate 71
5.7 Income stream for a medium earner participant who started saving at age 45 at 15 percent, who works halftime and takes half his social security between 65 and 70 years old 74
5.8 Income stream for a medium earner participant who started saving at age 55 at 15 percent, who works halftime and takes half his social security between 65 and 70 years old 74
5.9 Income stream for a medium income participant who started saving at age 45 at 15 percent, who works halftime and takes half his social security between 70 and 75 years old 75
5.10 Income stream for a medium income participant who started saving at age 55 at 15 percent, who works halftime and takes half his social security between 70 and 75 years old 75
6.1 Savings rate required for 75-percent income replacement in a range of market environments 82
6.2 Expected return of US 60/40 stock/bond portfolio, January 1900 to March 2017 84
6.3 Expected real returns versus return target 92
6.4 Expected return and risk of different portfolios and their portfolio risk allocation 93
7.1 Shares of aggregate income for aged units 65+, by source (2014, %) 102
7.2 Mean retirement account savings of families by age (1989 to 2013) 104
7.3 Federal spending as a percentage of GDP, by component (2000 to 2045) 105
7.4 The national retirement risk index (1983 to 2013, %) 107
8.1 Life cycle behavior and social security claiming patterns for males and females 125
9.1 Value of bonds and bond funds for various cohorts over time 138
9.3 Value of primary residence for various cohorts over time in 2015 US dollars, HRS data 1992–2014 140
9.4 Loan to value: primary residence for various cohorts over time, HRS data 1992–2014 140
9.5 Net value of other real estate for various cohorts over time in 2015 US dollars: those reporting as most risk averse via Arrow-Pratt HRS data 1992–2014 141
9.6 Net value of other real estate for various cohorts over time in 2015 US dollars: those reporting as least risk averse via Arrow-Pratt HRS data 1992–2014 142
9.7 Earnings for various cohorts over time in 2015 US dollars, HRS data 1992–2014 143
9.8 Net value of equities and mutual fund holdings for various cohorts over time in 2015 US dollars, HRS data 1992–2014 143
9.9 Average total assets in 2015 US dollars before and after retirement 144
9.10 Average total assets before and after retirement in 2015 US dollars: for HRS households with a retired person 145
9.11 Proportion of stocks to total assets for HRS households with a retired person 146
9.12 Proportion of bonds to total assets for HRS households with a retired person (excludes bonds held through mutual funds) 146
9.13 Proportion of liquid to total assets for HRS households with a retired person 147
9.14 Loan to value for primary residence for HRS households with retired person 148
11.1 Access to and participation in US private sector employer-sponsored retirement plans, 1987 to 2013 (workers aged 21–64) 175
11.2 US private sector retirement plan access by selected demographics 176
11.3 Participation in a US private sector retirement plan conditional on access 176
11.4 Reasons small and medium-sized businesses do not offer retirement plans 184
11.5 Employer attitudes toward auto IRA plans: US firms 186
12.1 Percentage of companies offering only DC plans (1998–2015) 197
12.2 Stages of transition toward DC in occupational pension plans 200
12.3 Total employer benefit values as a percentage of pay–United States 201
12.4 Expectations for future medical cost trends 202
12.5 Employees’ preferred allocation of benefits spend 203
12.6 Adoption of a financial well-being strategy 205
12.7 Expectation over importance of retirement security 208
12.8 Financial security becoming a bigger issue over 2015–2016 209
12.9 Relevance of employer retirement plans to finance retirement 211
12.10 Impact of recommendation on buying decisions 214
List of Tables

3.1  Target total pre-tax savings rates for various households just starting to save for retirement 35
3.2  Impact of retirement ages on target total pre-tax savings rates for a 35-year-old (%) 36
4.1  Future returns may not look like those from the past: Implications for a 60 percent equity/40 percent fixed income allocation 45
4.2  The black magic of compounding costs: Projected value of a $100 million portfolio 47
4.3  Possible return rationales for select equity and fixed income risk factors 49
4.4  Quantifying the decision hierarchy for plan sponsors 53
4.5  Risk-oriented strategies and ten-year change in funded status 56
5.1  Expected replacement rate by retirement age and contribution rate 65
5.2  US Social Security replacement rates by income level and retirement age 66
5.3  Difference in life expectancy for male Social-Security-covered workers, by age between selected earnings groups for the period 1999–2000 (in years) at different ages between top and bottom income quartiles 67
5.4  How would allowing deferral to age 75 affect Social Security replacement rates for different income cohorts? 72
6.1  Asset classes and investment strategies assumptions 90
6.2  Summary statistics of stepwise portfolio improvements 91
7.1  Shares of aggregate income by source and quintile of total money income (2014) 103
7.2  US labor force participation rates by age and sex (1985 to 2016, %) 109
7.3  Prevalence and part-time status of bridge employment, phased retirement, and re-entry by sex and health and retirement study cohort 112
8.1  Social Security claiming ages for females and males 126
8.2  Life cycle asset accumulation patterns for females and males 127
9A.1  Summary statistics 151
9A.2  Panel regression analysis of total assets, full sample 153
# List of Tables

9A.3 Panel regression analysis of total assets, subsamples of the wealth distribution 155
9A.4 Tobit regression analysis of bond allocations 157
9A.5 Tobit regression analysis of equity and mutual fund allocations 158
9A.6 Tobit regression analysis of LTV ratios among homeowners 159
11.1 Comparison of state retirement plan structures 177
11.2 Advantages and disadvantages to retirement plan types 178
11.3 Comparison of state retirement plan actions 180
11.4 Individual features of an auto IRA that business owners support 185
11.5 Individual features of a Multiple Employer Plan (MEP) that business owners support 186
12.1 Financial priorities across generations 212
Notes on Contributors

Daniel B. Berkowitz is an investment analyst at Vanguard. Prior to his work at Vanguard, he was a retirement plan specialist at the Ambrose Group and taught statistics at Cornell University. Daniel earned his bachelor’s degree from Cornell University and an M.B.A. with a distinction in finance from the Johnson Graduate School of Management at Cornell.

David Blanchett is head of retirement research for Morningstar Investment Management LLC, where he works in the group’s consulting and investment services and conducts research on financial planning, tax planning, annuities, and retirement. He earned his master’s degree in financial services from the American College, his master’s degree in business administration from the University of Chicago Booth School of Business, and his doctorate in personal financial planning program from Texas Tech University.

Alistair Byrne heads European DC investment strategy for State Street Global Advisors in London. He has also been a senior DC investment consultant at Towers Watson, an investment manager for AEGON UK, and a finance faculty member at the University of Strathclyde and University of Edinburgh business schools. He has a particular interest in the application of behavioral finance to retirement saving and financial planning decisions. Mr. Byrne received his Ph.D. in finance from the University of Strathclyde in Glasgow and he is a Chartered Financial Analyst (CFA)® charterholder.

Kevin E. Cahill is a research economist with the Center on Aging and Work at Boston College and a senior economist at ECONorthwest, an economics and public policy consulting firm based in Portland, Oregon. His research examines labor force withdrawal including bridge job employment and re-entry, retirement income, occupational changes later in life, and the role of employer-provided pensions in the retirement decisions of older workers. Previously he served as an economist at Abt Associates and Analysis Group. He helped found the journal Work, Aging, and Retirement. He earned his B.A. in mathematics and economics from Rutgers College, and his M.A. and Ph.D. in economics from Boston College.

Robert Clark is Stephen Zelnak Professor of Economics and Professor of Management, Innovation and Entrepreneurship in the Poole College of Management, North Carolina State University. He is also Research Associate
at the National Bureau of Economic Research and a member of the Advisory Board of the Pension Research Council. His research examines retirement decisions, the choice between defined benefit and defined contribution plans, the impact of pension conversions to defined contribution and cash balance plans, the role of information and communications on 401(k) contributions, and government regulation of pensions. He has also evaluated employer-provided financial literacy and retirement planning programs and how these plans affect worker decisions, as well as state and local pensions and retiree health plans. He earned his M.S. and Ph.D. from Duke University, and his B.A. from Millsaps College in economics.

Andrew S. Clarke is a senior investment strategist at the Vanguard Investment Strategy Group, where he researches how ordinary people do (and do not) succeed in meeting their financial goals. Previously he worked at Morningstar. He earned his B.A. from Haverford College and his M.S. from West Chester University. He is a CFA® charterholder.

Peter Conti-Brown is an Assistant Professor at The Wharton School of the University of Pennsylvania. A financial historian and a lawyer, he studies central banking, financial regulation, and public finance, with a particular focus on the history and policies of the US Federal Reserve System. He has published one book, The Power and Independence of the Federal Reserve, and has another forthcoming on bank supervision in the United States from the Civil War to Donald Trump. He also has a comprehensive political and institutional history of the US Federal Reserve. He earned his Ph.D. from Princeton University in history, and his J.D. from Stanford. His A.B. is from Harvard College.

Kevin J. DiCiurcio is a senior investment strategist at Vanguard Investment Strategy Group. He earned his M.B.A. in finance from Villanova University and his B.S. in Business Administration (finance) from the University of Richmond. He is a CFA® charterholder.

Jason J. Fichtner is a Senior Research Fellow with the Mercatus Center at George Mason University. His research focuses on social security, federal tax policy, federal budget policy, retirement security, and policy proposals to increase saving and investment. Previously, he worked for the Social Security Administration as Deputy Commissioner of Social Security (acting), Chief Economist, and Associate Commissioner for Retirement Policy. He also served as Senior Economist with the Joint Economic Committee of the US Congress. Currently he also teaches as an adjunct professor at the Georgetown McCourt School of Public Policy, the Johns Hopkins School of Advanced International Studies, and the Virginia Tech Center for Public Administration and Policy, where he offers courses in economics, public finance, public policy process, public management, and public budgeting.
processes. Dr. Fichtner earned his B.A. from the University of Michigan, his M.P.P. from Georgetown University, and his Ph.D. in public administration and policy from Virginia Tech.

Michael Finke is Dean and Chief Academic Officer of The American College of Financial Services. His research interests include household investment and intertemporal choice, behavioral personal finance, agency costs of financial planning, retirement income planning, risk tolerance assessment, and aggregate trends in household portfolio allocation. He received the 2013 and 2014 Montgomery Warschauer best paper awards from the *Journal of Financial Planning*. He received his Ph.D. in consumer economics from the Ohio State University and also in finance from the University of Missouri.

William Gale holds the Arjay and Frances Miller Chair in Federal Economic Policy and is a senior fellow in the Economic Studies Program at the Brookings Institution. His research focuses on tax policy, fiscal policy, pensions, and saving behavior. He is co-director of the Tax Policy Center, a joint venture of the Brookings Institution and the Urban Institute. He is also director of the Retirement Security Project, and he is a member of the Macroeconomic Advisers Board of Advisors. Previously he taught at the University of California, Los Angeles, and he served as a senior economist for the Council of Economic Advisers under President George H.W. Bush. Dr. Gale attended Duke University and the London School of Economics, and he received his Ph.D. in economics from Stanford University.

Natalia Garabato is an economist at Willis Towers Watson. Her interests include labor economics, pension and retirement finance, foundations and endowments asset liability modeling, and access to finance. Previously she worked at the Inter-American Development Bank. She received her Ph.D. in economics from the University of New South Wales (UNSW), Sydney and her B.A. in economics from the Universidad de la Republica, Montevideo.

Jonathan Gardner is a senior economist at Willis Towers Watson. His research interests include pensions, behavioral finance, labor economics, and health economics. Dr. Gardner earned his Ph.D. in economics at the University of Warwick, and his M.Sc. from University College London.

Vanya Horneff is a Ph.D. researcher at the House of Finance, Goethe University of Frankfurt. Her research interests include public finance, public economics, and financial economics. She is a member of the SAFE Research Center at the University.

Antti Ilmanen manages AQR’s Portfolio Solutions Group, advising institutional investors and sovereign wealth funds, and he also develops the firm’s broad investment ideas. Previously he was a senior portfolio manager at Brevan Howard, worked at Salomon Brothers/Citigroup, and served as a
Notes on Contributors

central bank portfolio manager in Finland. He has advised institutional investors including Norway’s Government Pension Fund Global and the Government of Singapore Investment Corporation. His publications have received a Graham and Dodd award and Bernstein Fabozzi/Jacobs Levy awards. Dr. Ilmanen received his M.Sc. degrees in economics and law from the University of Helsinki, and his Ph.D. in finance from the University of Chicago.

David John is a senior strategic policy advisor at the AARP Public Policy Institute, where he works on pension and retirement savings issues. He also serves as a deputy director of the Retirement Security Project at the Brookings Institution. Previously Dr. John was a senior research fellow at the Heritage Foundation; he also worked for a money center bank, a law firm, a credit union trade association, and for members of the House of Representatives. He is also a member of the National Academy of Social Insurance. He has written extensively on reforming retirement programs, and he co-invented with J. Mark Iwry the Automatic IRA. He earned his A.B.J. in journalism, his M.A. in economics, and his M.B.A. in finance from the University of Georgia.

Raimond Maurer is the Chair of Investment, Portfolio Management, and Pension Finance at the Finance Department of the Goethe University of Frankfurt. He is also Dean of the Faculty of Economics and Business Administration. His research focuses on asset management, life-time portfolio choice, real estate, and pension finance. Previously he visited the Wharton School as a Metzler Vising Professor, and he serves in several professional capacities including the Union Real Estate Investment Group, the Society of Actuaries (academic chair of AFIR), the Association of Certified International Investment Analysts (academic director and member of the International Examination Committee). He earned his Habilitation, Ph.D., and Diploma in business administration from Mannheim University, and he received an honorary doctorate from the State University of Finance and Economics of St. Petersburg.

Olivia S. Mitchell is the International Foundation of Employee Benefit Plans Professor, as well as Professor of Insurance/Risk Management and Business Economics/Policy; Executive Director of the Pension Research Council; and Director of the Boettner Center on Pensions and Retirement Research, all at the Wharton School of the University of Pennsylvania. Concurrently Dr. Mitchell serves as a Research Associate at the NBER; Independent Director on the Wells Fargo Fund Boards; Co-Investigator for the Health and Retirement Study at the University of Michigan; Member of the Executive Board for the Michigan Retirement Research Center; and Senior Scholar at the Singapore Management University. She also advises the
Notes on Contributors  xix

Centre for Pensions and Superannuation UNSW and is Faculty Affiliate of
the Wharton Public Policy Initiative. She received her M.A. and Ph.D.
degrees in economics from the University of Wisconsin-Madison, and her
B.A. in economics from Harvard University.

Steven A. Nyce is the Director of Willis Towers Watson’s Research and
Innovation Center where he works on employee attitudes towards benefit
programs and their impact on employee behaviors, workforce productivity,
and employee well-being. Dr. Nyce also focuses on the US healthcare
market and the implications of recent plan design trends and workplace
initiatives as well as the emergence of private healthcare exchanges and
modeling the buying patterns of employees in a consumer-grade environ-
ment. He earned his B.S. degree in economics from LaSalle University, and
his M.A. and Ph.D. in economics from the University of Notre Dame.

Wade Pfau is a professor of retirement income in the Ph.D. in Financial and
Retirement Planning program at The American College of Financial Ser-
dvices. His areas of expertise are annuities, investments, portfolio manage-
ment, and retirement planning. His research has earned him two
Montgomery-Warschauer Awards, the Academic Thought Leadership
Award from the Retirement Income Industry Association, and a best paper
award winner from the Academy of Financial Services. He earned his
doctorate and master’s in economics from Princeton University, and B.A.
and B.S. degrees from the University of Iowa. He is also a Chartered
Financial Analyst.

Joseph Quinn is a professor of economics at Boston College, where he also
served as Dean of the College of Arts and Sciences and Interim Provost and
Dean of the Faculties. His research interests include the economics of aging,
the determinants of individual retirement decisions, recent trends in the
retirement patterns of older Americans, and social security reform. He co-
chaired (with Olivia Mitchell) the Technical Panel on Trends and Issues in
Retirement Savings for President Clinton’s Social Security Advisory Council.
A founding member of the National Academy of Social Insurance, he was
elected to its Board of Directors and served as Vice President. He earned his
Ph.D. from the Massachusetts Institute of Technology and his B.A. from
Amherst College, where he currently serves as a trustee.

Matthew Rauseo is Vice President of Business Development, Defined Con-
tribution Strategist at AQR Capital Management. His purview is institutional
defined contribution plans, where he focuses on asset allocation, portfolio
construction, and investment menu design. He holds his B.A. in Business
Administration and Management from Northeastern University.
xx Notes on Contributors

Catherine Reilly is Global Head of Research, Defined Contribution at State Street Global Advisors, where she focuses on global retirement saving and retirement plan design. Previously she was Chief Economist of Pohjola Asset Management in Finland, where she was responsible for advising large institutional clients on asset allocation decisions. She has also worked for McKinsey and Company in Helsinki. Catherine earned her M.P.A. from the Harvard Kennedy School of Government and her M.Sc. in economics and finance from the Helsinki School of Economics.

Jason S. Seligman is an economist with the US Department of the Treasury’s Office of Economic Policy, a fellow at the TIAA Institute, and an affiliate of the Center for Financial Security at the University of Wisconsin, Madison. His research focuses on public finance including disability insurance. Dr. Seligman earned his Ph.D. in economics from the University of California, Berkeley.

Yvonne Sonsino is the Innovation Leader at Mercer for the Europe and Pacific Region, exploring the development of new health, wealth, and career solutions to support the workforce of the future. Her research interests include population aging, automation, the future of jobs, and gender parity. Her projects have included pension plan redesign and financing, career framework implementation, and motivation techniques to drive performance. She is the Co-Chair of the UK Government Department for Work and Pensions Business Strategy Group examining how employers can improve the recruitment, retention, and retraining of older workers. She holds two psychology degrees from The Open University, and her M.A. in business research is from Durham University.

Kimberly A. Stockton is an investment research analyst at Vanguard Investment Strategy Group where she conducts investment research to support portfolio construction solutions and the development of new products, tool, services, and strategies. Her published research includes work on passive investing, tactical asset allocation, pension plan investment strategy, and single portfolio solutions methodology. Her M.B.A. in finance is from Villanova University and her B.A. in economics from the University of California Berkeley.

Daniel W. Wallick is a principal in the Vanguard Investment Strategy Group where he is responsible for developing portfolio strategies and overseeing the development of the firm’s Capital Markets Model. He has advised pensions, endowments, and foundations and his research focuses on portfolio construction and liability-driven investments. Previously he worked for a public finance investment firm. He earned his B.A. in history from the University of Pennsylvania and his M.B.A. from Harvard University.