

Reshaping Retirement Security

Reshaping Retirement Security

Lessons from the Global Financial Crisis

EDITED BY

Raimond Maurer,
Olivia S. Mitchell,
and Mark J. Warshawsky

OXFORD
UNIVERSITY PRESS

OXFORD
UNIVERSITY PRESS

Great Clarendon Street, Oxford, OX2 6DP,
United Kingdom

Oxford University Press is a department of the University of Oxford.
It furthers the University's objective of excellence in research, scholarship,
and education by publishing worldwide. Oxford is a registered trade mark of
Oxford University Press in the UK and in certain other countries

© Pension Research Council, the Wharton School, the University of Pennsylvania 2012

The moral rights of the authors have been asserted

First Edition published 2012

Impression: 1

All rights reserved. No part of this publication may be reproduced, stored in
a retrieval system, or transmitted, in any form or by any means, without the
prior permission in writing of Oxford University Press, or as expressly permitted
by law, by licence or under terms agreed with the appropriate reprographics
rights organization. Enquiries concerning reproduction outside the scope of the
above should be sent to the Rights Department, Oxford University Press, at the
address above

You must not circulate this work in any other form
and you must impose this same condition on any acquirer

British Library Cataloguing in Publication Data
Data available

Library of Congress Cataloging in Publication Data
Data available

ISBN 978–0–19–966069–8

Printed in Great Britain by
MPG Books Group, Bodmin and King's Lynn

Preface

Over the past few years, the worldwide financial crisis has brought deep changes in capital and labor markets, old-age retirement systems, and household retirement and consumption patterns. Around the world, plan sponsors, fiduciaries, policymakers, and households have gained a new awareness of retirement risk. This volume, the newest in our Pension Research Council/Boettner Center Series, draws out lessons learned regarding how retirement planning and long-term financial security have changed in the wake of the turmoil. This book is a welcome addition to all concerned with the future of financial security in retirement around the globe.

In the process of preparing this book, several key people and institutions played essential roles. Superb editorial comments were provided by my co-editors Raimond Maurer and Mark J. Warshawsky. On behalf of the Council, I thank both of them, as well as the many contributors to the volume, the reviewers who helped bring this work to fruition, and the Council's Advisory Board on whom we rely for guidance. This manuscript was expertly prepared and thoroughly edited by Andrew Gallagher with assistance from Irene Shaffer and Heather Shrigley. We are particularly grateful for the intellectual and financial sustenance provided by our Senior Partners and the Institutional Members of the Pension Research Council, listed elsewhere in this volume. The Wharton School graciously provided access to conference facilities and more through its Impact Conference funding. Additional financial 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.

I also express continued appreciation for the fine collaboration with Oxford University Press, which hosts the Pension Research Council Series on retirement security. On behalf of the Pension Research Council and the Boettner Center for Pensions and Retirement Security of the Wharton School of the University of Pennsylvania, we are pleased to continue in our tradition of research and dissemination on pensions and retirement security around the world.

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

Contents

<i>List of Figures</i>	ix
<i>List of Tables</i>	xi
<i>List of Abbreviations</i>	xiv
<i>Notes on Contributors</i>	xvii

1. Retirement Security and the Financial and Economic Crisis: An Overview	1
<i>Raimond Maurer, Olivia S. Mitchell, and Mark J. Warshawsky</i>	

Part I. Rethinking Retirement in the New Economic Era

2. Changing Retirement Behavior in the Wake of the Financial Crisis	13
<i>Julia Coronado and Karen Dynan</i>	
3. Potential Impacts of the Great Recession on Future Retirement Incomes	36
<i>Barbara A. Butrica, Richard W. Johnson, and Karen E. Smith</i>	
4. Effects of the Economic Crisis on the Older Population: How Expectations, Consumption, Bequests, and Retirement Responded to Market Shocks	64
<i>Michael Hurd and Susann Rohwedder</i>	
5. Retirement Behavior and the Global Financial Crisis	81
<i>Jason J. Fichtner, John W. R. Phillips, and Barbara A. Smith</i>	

Part II. Rethinking the Resilience of Defined Contribution Plans

6. Trading in 401(k) Plans during the Financial Crisis	101
<i>Ning Tang, Olivia S. Mitchell, and Stephen P. Utkus</i>	
7. Life Cycle Impacts of the Financial Crisis on Optimal Consumption—Portfolio Choices and Labor Supply	120
<i>Jingjing Chai, Raimond Maurer, Olivia S. Mitchell, and Ralph Rogalla</i>	

viii Contents

8. A Stress Test for the Private Employer Defined Contribution System 151
David Wray

**Part III. How Defined Benefit Plans Handled
the Financial Crisis**

9. Defined Benefit Pension Plans and the Financial Crisis: Impact and Sponsors and Government Reactions 161
Mark J. Warshawsky
10. Multiemployer Pension Plans Respond to the Financial Crisis 188
Judith F. Mazo and Eli Greenblum
11. Adopting Hybrid Pension Plans: Effects of Economic Crisis and Regulatory Reform 215
Robert L. Clark, Alan Glickstein, and Tomeka Hill
12. Collective Pensions and the Global Financial Crisis: The Case of the Netherlands 235
Lans Bovenberg and Theo Nijman
13. How Have Public Sector Pensions Responded to the Financial Crisis? 262
Andrew G. Biggs
- End Pages* 273
Index 277

List of Figures

2.1	Household net worth as a percent of disposable income: 1965–2011	14
2.2	US stock and home prices: 1985–2010	15
2.3	US homeownership rate: 1965–2011	16
2.4	Measures of US household stress resulting from debt: 1965–2011	17
2.5	Median household net worth (\$ 2010) by household head age over time	21
2.6	US average household income, consumption, and home value over time	24
2.7	US credit card repayment behavior: 1993–2011	30
2.8	US mortgage refinancing transactions: 1989–2011	31
2.9	Net cash flows into US mutual funds: 1993–2011	31
2.10	New York Stock Exchange trading volumes: 1995–2011	32
3.1	Employment rate of men and women aged 16–64: 1993–2035	39
3.2	Average earnings of workers by simulation in \$ 2010: 2005–30	40
4.1	Cumulative distribution of the reported subjective probability of a stock market gain one year ahead	74
5.1	Percent of OASDI benefits awarded at age 62	84
5.2	Percent of fully insured workers who claim at age 62: cohorts born 1913–48 (by sex)	85
5.3	Percent of fully insured workers who claim at age 62: cohorts born 1913–48 (by race)	86
5.4	Unemployment rates and percent claiming at age 62 by state (2009)	87
5.5	Unemployment rates and percent claiming at age 62 across states (2009)	87
6.1	Proportion of 401(k) participants trading over time	106
6.2	Distribution of the number of trades: precrisis, crisis, and entire period	108
7.1	Short-term effects of financial/economic crises on young cohort (age 20). Panel (A): expected work hours; Panel (B): expected consumption; Panel (C): expected saving/withdrawal; Panel (D): expected stock investment	132

x List of Figures

7.2	Short-term effects of financial/economic crises on near-retirement cohort (age 55). Panel (A): expected work hours; Panel (B): expected consumption; Panel (C): expected saving/withdrawal; Panel (D): expected stock investment	136
7.3	Long-term effects of financial/economic crises on young cohort (age 20). Panel (A): expected work hours; Panel (B): expected consumption; Panel (C): expected saving/withdrawal	140
7.4	Long-term effects of financial/economic crises on near-retirement cohort (age 55). Panel (A): expected consumption; Panel (B): expected withdrawal	143
8.1	Percentage of participants contributing to plans that cease making contributions by the year end: 2006–10	153
9.1	Total index monthly and annual returns, S&P 500 (%): 2007–10	162
9.2	Composite Corporate Bond Rate (%): month-end, 2007–10	163
9.3	Pension funding status for Fortune 1000 companies: percentage per year 2000–10	164
9.4	Funding status of defined benefit pensions offered by Fortune 1000 companies: 2008–10	165
9.5	Equity shares for private DB and DC plan assets: 1995–2009	166
9.6	DB plan asset allocations to equities of Fortune 1000 companies: 2005–9	168
9.7	Composite Corporate Bond Rate (CCBR) and PBGC rates: 2001–10	179
11.1	Number of defined benefit plans, hybrid plans, and hybrid plan conversions	223
12.1	Conditional indexation and contribution mechanisms in the Dutch pension system	238
12.2	Average nominal funding rate of Dutch pension funds: 1988–2010	241
12.3	Average pension contribution rates as percentage of gross wage income: 1970–2008	243
13.1	Median public pension asset allocations, with 10th and 90th percentiles: 2007	264
13.2	Median public pension asset allocations, with 10th and 90th percentiles: 2009	265
13.3	Median target asset allocations, with 10th and 90th percentiles: 2007 vs 2010	266
13.4	Change in standard deviation of target portfolio returns: 2007–10	270

List of Tables

2.1	Household median net worth in 2007 by age of head (\$ 2010)	18
2.2	Household assets by age of head: ownership, holdings, and portfolio shares (in 2007; \$ 2010)	19
2.3	Household debt by age of head: ownership, holdings, and ratio to income (in 2007; \$ 2010)	19
2.4	Distribution of selected assets and debt by age of head: 2007	20
2.5	Changes in real spending and income by age of head: 2002–9	26
2.6	Employment conditions and choices by age, through the recession	28
3.1	Employment rates in 2010, adults aged 25–64	41
3.2	Projected work histories of future retirees at age 70	44
3.3	Projected income of future retirees at age 70	45
3.4	Average per capita household income of future retirees at age 70 by income source and income quintile	47
3.5	Projected number and share of adults at age 70 with low incomes	49
3.6	Average projected per capita household income of future retirees at age 70, by personal characteristics	51
3.7	Projected survival rates at age 70 by sex, education, and employment status between 2008 and 2013	54
4.1	Household spending 2011 compared to a year ago (%)	67
4.2	Important reasons for spending decline by age: percent stating very or somewhat important	67
4.3	Important reasons for spending increase by age: percent stating very or somewhat important	68
4.4	Two-year change in real consumption: 2001–7 and 2007–9	69
4.5	Summary of two-year change in nondurable spending (%)	69
4.6	Home values and housing debt balances (\$000, 2010)	71
4.7	Home values, housing debt, and negative home equity (\$000, 2010)	72
4.8	House price expectations, one year and five years ahead	73
4.9	Bequest probabilities and expected bequests (\$ 2010), weighted	75

xii List of Tables

4.10	Average subjective probability (%) of working past age 62 among those working in 2008: ages 51–61	76
4.11	Average subjective probability (%) of working past age 65 among those working in 2008: ages 51–61	77
5.A1	Beneficiary claiming rates, by birth cohort	91
5.A2	Unemployment rates and percentage claiming at age 62 across states (2009)	92
6.1	Incidence of 401(k) trading	105
6.2	Demographic characteristics of traders as of September 2008	107
6.3	Portfolio and trading characteristics	109
6.4	Determinants of net flows to equities for 401(k) plan traders: precrisis versus crisis periods	111
6.5	Determinants of net flows to equities for 401(k) plan traders by type of trader: precrisis versus net flow to equities	113
7.1	Long-term impacts of crisis on asset allocation of young cohort (age 20)	142
7.2	Crisis impact on retirement behavior of young cohort (age 20)	144
7.3	Long-term impacts of crisis on asset allocation of near-retirement cohort (age 55)	145
7.4	Crisis impact on retirement behavior of near-retirement cohort (age 55)	145
8.1	Percentage of DC plans offering target-date funds, professionally managed accounts, and/or investment advice to participants	154
9.1	Employer contributions to corporate DB plans by Fortune 1000 companies: 1999–2009 (\$000 nominal)	169
9.2	Retirement plans offered to newly hired employees by Fortune 100 firms: 1998–2011	171
9.3	Estimates and projections of DB corporate plan funded status and required minimum contributions: 2008–14	175
9.4	Pension Benefit Guaranty Corporation (PBGC) single-employer insurance program: net position, 2001–10 (\$m)	176
9.5	Pension Benefit Guaranty Corporation (PBGC) single-employer insurance: annual operations, 2007–10 (\$m)	177
9.6	Pension Benefit Guaranty Corporation (PBGC) single-employer insurance program: key indicators	178
10.1	Breakdown of multiemployer plans by certified zone status by percentage of plans in each: 2008–10 zone	202

List of Tables xiii

10.2	Geographical and industry distribution of red-zone and bright-red-zone multiemployer plans in 2010	204
10.3	Funded percentage distribution of red-zone and bright-red-zone multiemployer plans in 2010	205
10.4	Average funded percentage and market value of assets of red-zone and bright-red-zone multiemployer plans in 2010	211
11.1	Hybrid plan share of all nonfrozen DB plans with 1,000+ participants: 2000–7	220
11.2	Hybrid plan share of all DB plans in Fortune 1000: 2000–7	221
11.3	Hybrid plans as percent of DB plans by industry: 2007	222
11.4	Pension plan conversions over time	224
11.5	Plan features by conversion status: 2000–9	227
11.6	Logit regression analysis of the overall probability of hybrid plan conversion in Fortune 1000 companies: 2000–9	227
11.7	Logit regression analysis of the annual probability of hybrid plan conversion in Fortune 1000 companies: 2000–9	228
11.8	Logit regression analysis of the annual probability of hybrid plan conversion in Form 5500 plans with 1,000+ participants: 2000–7	229
11.9	Plan features by conversion status for Form 5500 pension plans sponsored by Fortune 1000 companies: 2000–7	231
11.10	Plan conversion logit regression results for Fortune 1000 companies with plans found in the Form 5500: 2000–7	231
12.1	Actual increases in nominal pensions paid to retirees, compared to the indexation ambition: 2005–11	242
13.1	Expected risk and return of pension asset classes (%)	268
13.2	Correlation matrix for pension asset classes	268
13.3	Summary statistics on public pension portfolio standard deviations (%): 2007 and 2010	269

List of Abbreviations

AAA	American Academy of Actuaries
ACLI	American Council of Life Insurers
ACMBPRA	Access to Care for Medicare Beneficiaries and Pension Relief Act
AEI	American Enterprise Institute
AIME	average indexed monthly earnings
AMEX	American Stock Exchange
AR1	autoregressive model
BC	business cycle
BEA	Bureau of Economic Analysis
BLS	Bureau of Labor Statistics
BVI	German Investment and Asset Management Association
CAFR	Comprehensive Annual Financial Report
CAMS	Consumption and Activities Mail Survey
CB	cash balance
CCBR	Composite Corporate Bond Rate
CD	certificate of deposit
CEIOPS	Committee of European Insurance and Occupational Pensions Supervisors
CEX	Consumer Expenditure Survey
CPI	Consumer Price Index
CPS	Current Population Survey
CRR	Center for Retirement Research
CRS	Congressional Research Service
CRSP	Center for Research in Security Prices
CWHS	Continuous Work History Sample
DB	defined benefit
DC	defined contribution
DFG	German Science Foundation
DOL	US Department of Labor
DYNASIM3	Urban Institute's dynamic microsimulation model

List of Abbreviations xv

EBRI	Employee Benefit Research Institute
EIN	Employer Identification Number
EIOPA	European Insurance and Occupational Pensions Authority
EOY	End-of-Year
EPS	earnings per share
ERA	early retirement age
ERISA	Employee Retirement Income Security Act
EU	European Union
FIP	Funding Improvement Plan
FPL	federal poverty level
FRA	full retirement age
FRB	Board of Governors of the Federal Reserve System
GDP	gross domestic product
GNP	Gross National Product
HCE	highly compensated employee
HRS	Health and Retirement Study
ICI	Investment Company Institute
IRA	individual retirement account
IRC	Internal Revenue Code
IRS	Internal Revenue Service
LRA	late retirement age
MPPAA	Multiemployer Pension Plan Amendments Act
MRRC	Michigan Retirement Research Center
NAR	National Association of Realtors
NASDAQ	National Association of Securities Dealers Automated Quotations
NBER	National Bureau of Economic Research
Netspar	Network for Studies on Pensions, Aging and Retirement
NIA	National Institute on Aging
NRA	normal retirement age
NYSE	New York Stock Exchange
OASDI	Old Age, Survivors, and Disability Insurance
OECD	Organisation for Economic Co-operation and Development
OTC	over-the-counter

xvi List of Abbreviations

PBGC	Pension Benefit Guaranty Corporation
PBO	pension benefit obligation
PEBES	Personal Earnings and Benefit Estimate Statement
PEP	pension equity plan
Pew	Pew Center on the States
PIA	primary insurance amount
PIMS	Pension Insurance Modeling System
PPA	Pension Protection Act
PRA	Pension Relief Act
PSCA	Profit Sharing/401k Council of America
PSID	Panel Study of Income Dynamics
QC	quarter of coverage
RCS	Retirement Confidence Survey
RRC	Retirement Research Consortium
S&P	Standard & Poor's
SCF	Survey of Consumer Finances
SEC	Securities Exchange Commission
SER	Summary Earnings Record
SIPP	Survey of Income and Program Participation
SSA	Social Security Administration
SSAB	Social Security Advisory Board
SSI	supplemental security income
SZW	Netherlands Ministry of Social Affairs and Employment
TDF	target-date fund
WHO	World Health Organization
WRERA	Worker, Retiree, and Employer Recovery Act

Notes on Contributors

Andrew G. Biggs is a Resident Scholar at the American Enterprise Institute (AEI), where his work focuses on Social Security, pensions, and related retirement and budgetary issues. Prior to joining AEI, he served as a staff member to President Bush's 2001 Commission to Strengthen Social Security, on the staff of the White House National Economic Council in 2005, and as deputy commissioner for policy and principal deputy commissioner of the Social Security Administration. He holds a Bachelor's degree from the Queen's University of Belfast, Master's degrees from Cambridge University and the University of London, and a Ph.D. from the London School of Economics.

Lans Bovenberg is a Professor of Economics at Tilburg University. In 2003, he won the Spinoza prize—the second Dutch social scientist ever to win this prize. With the prize money, he founded the research network Netspar (Network for Studies on Pensions, Aging and Retirement) in which various pension funds, insurance companies, public agencies, and universities participate. He has published extensively in the leading international journals on a wide variety of topics: public economics, tax policy, environmental economics, institutional economics, pensions and aging, international macroeconomics, and labor economics.

Barbara A. Butrica is a Senior Research Associate at the Urban Institute, where she studies issues related to the economic security of the boomer generation, pensions, Social Security, and the engagement of older adults. She previously served as an analyst at Mercer Human Resource Consulting, where she worked with employers to identify the best human capital practices for their own organizations. Before that she was an economist at the Social Security Administration, where she developed a detailed knowledge of Social Security regulations. In 1998, she received her Ph.D. in Economics from Syracuse University.

Jingjing Chai is a doctoral student in the Department of Finance at Goethe-University, Frankfurt, where she teaches courses on Financial Mathematics, as well as Law and Finance. She received her business degree in Finance and Quantitative Methods from Goethe-University, Frankfurt, in 2007.

Robert L. Clark is Professor of Economics and Professor of Management, Innovation, and Entrepreneurship, North Carolina State University. He has conducted research examining retirement decisions, the choice

xviii Notes on Contributors

between defined benefit (DB) and defined contribution (DC) plans, the impact of pension conversions to DC and cash balance plans, the role of information and communications on 401(k) contributions, government regulation of pensions, and Social Security. He has recently completed books examining the development of state and local retirement plans in the twentieth century and retiree health plans for public sector employees. Professor Clark earned a BA from Millsaps College and an MA and Ph.D. from Duke University.

Julia Coronado is Chief Economist, North America for BNP Paribas' global market economics team. Prior to joining BNP Paribas, Julia was a Senior US Economist at Barclays Capital in New York, where she helped formulate the forecast for the US Economy and Fed policy. She has deep expertise in aging issues and worked as Director of Retirement Research at Watson Wyatt Worldwide. She currently serves on the Advisory Board of the Pension Research Council at the Wharton School and received the Ph.D. in Economics from the University of Texas.

Karen Dynan is Vice President, Co-director of the Economic Studies program, and the Robert S. Kerr Senior Fellow at the Brookings Institution, where she focuses on macroeconomic and household finance issues. Prior to joining Brookings, she had worked with the Federal Reserve Board as a Senior Advisor. She has also served as a Senior Economist at the White House Council of Economic Advisers and as a Visiting Assistant Professor at Johns Hopkins University. She received her Ph.D. in Economics from Harvard University and her AB from Brown University.

Jason J. Fichtner is Senior Research Fellow at the Mercatus Center at George Mason University, a university-based research, education, and outreach organization that works with scholars, policy experts, and government officials to bridge academic learning and real-world practice. Previously, he served in several positions at the Social Security Administration, including the Deputy Commissioner of Social Security (Acting), Chief Economist and Associate Commissioner for Retirement Policy. He has also served as a Senior Economist with the Joint Economic Committee of the United States Congress. His primary research interests are Social Security, federal tax policy, budget issues, and policy proposals to increase saving and investment. He received the BA from the University of Michigan; the MPP from Georgetown University; and the Ph.D. in Public Administration and Policy from Virginia Tech.

Alan Glickstein is a senior retirement consultant in the Dallas office of Towers Watson. He specializes in the strategic design and financing of total compensation packages, with a particular concentration in the retirement benefit area. His areas of focus include cash balance plans, retirement

Notes on Contributors xix

research, and the financial and risk management aspects of benefit plans. He also leads Towers Watson's national consulting team with respect to accounting for stock-based compensation. He is an Enrolled Actuary with the Internal Revenue Service and an Associate of the Society of Actuaries. He holds a BA in Mathematics from Queens College.

Eli Greenblum is a member of the Office of the Chief Actuary for The Segal Company and serves on their national actuarial policy committee. In addition to his consulting activities, the performance of actuarial valuations on behalf of plan sponsors, and PPA'06 certification/remedial plan efforts, he also works to navigate retirement plan issues with labor and management representatives engaged in the collective bargaining process. Mr Greenblum has over twenty-five years of actuarial consulting experience, having served as the consulting actuary for select multiemployer and public sector clients. He is a member of the American Academy of Actuaries (AAA) Pension Practice Council and Pension Committee, as well as chair of the AAA Multiemployer Plans Subcommittee. He earned a BA in Mathematics from the State University of New York at Albany.

Tomeka Hill is a Senior Research Associate for Towers Watson, where her interests include retirement and savings behavior of employees. Her research has focused on the impact of changes in retirement plan design, phased retirement, and general labor force trends in the United States. She received her BS degree in Mathematics from Duke University, her MS degree in Statistics from American University, and her Ph.D. in Economics from Cornell University.

Michael Hurd is a Senior Principal Researcher at RAND and the Director of the RAND Center for the Study of Aging. His published research covers a wide range of topics in the economics of aging, including the structure of private pensions and Social Security and their effects on retirement decisions, the economic status of the elderly, the determinants of consumption and saving, the use of health care services, the relationship between socioeconomic status and mortality, and the effects of the Great Recession. He is on the editorial board of the *Journal of Population Ageing* and a member of the Board of Directors of the Western Economic Association International. He received a Master's degree in Statistics and a Ph.D. in Economics from the University of California, Berkeley.

Richard W. Johnson is a Senior Fellow at the Urban Institute, where he directs the Program on Retirement Policy and is an expert on older Americans' employment and retirement decisions. Recent studies include analyses of older adults' employment during the 2007–10 economic downturn, occupational change at older ages, changes over time in job demands, and work impediments at older ages. He has also written extensively about

xx Notes on Contributors

retirement preparedness, including studies of the financial and health risks people face as they approach retirement, economic hardship in the years before Social Security's early eligibility age, and gender differences in pension wealth. He received his Ph.D. in economics from the University of Pennsylvania.

Raimond Maurer holds the endowed Chair of Investment, Portfolio Management, and Pension Finance in the Finance Department at the Goethe-University, Frankfurt. His research focuses on asset management, life-time portfolio choice, and pension finance. He serves in professional capacities for the Society of Actuaries, the Association of Certified International Investment Analysts, and the Advisory Board of the Wharton School's Pension Research Council. He received his habilitation, his Ph.D., and his Diploma in Business from Mannheim University.

Judith F. Mazo is a Senior Vice President for The Segal Company's Washington, DC office. She is responsible for directing research and providing guidance on public policy, legislative and regulatory issues, and other matters of interest to Segal clients. Prior to joining Segal, she was engaged in private law practice in Washington, DC, specializing in Employee Retirement Income Security Act (ERISA) and serving as special counsel to the US Pension Benefit Guaranty Corporation (PBGC) and as a consultant to the Pension Task Force of the Committee on Education and Labor of the US House of Representatives. Ms Mazo has also served on the US Department of Labor's ERISA Advisory Council and chaired its Working Groups on Cash Balance Plans and on Disclosures Regarding Health Care Quality. She received her J.D. with honors from Yale Law School and her BA from Wellesley College.

Olivia S. Mitchell is the International Foundation of Employee Benefit Plans Professor of Insurance and Risk Management at the Wharton School, University of Pennsylvania. Her main areas of interest are private and public insurance, risk management, public finance, labor markets, compensation, and pensions with both a US and an international focus. She received the BA in Economics from Harvard University and the MS and Ph.D. in Economics from the University of Wisconsin-Madison.

Theo Nijman is the Van Lanschot professor in Investment Theory at Tilburg University. His recent work covers topics such as pension fund management, the optimal individual pension contract, measurement and management of inflation, interest and longevity risk, and performance attribution and measurement. He is Scientific Director of the Network for Studies on Pensions Aging and is the Academic Coordinator of Inquire Europe, which brings together investment professionals interested in

Notes on Contributors xxi

understanding and developing quantitative solutions to investment problems. He received the Ph.D. in Econometrics from Free University.

John W. R. Phillips is a Labor Economist at the National Institute on Aging (NIA) Division of Behavioral and Social Research. He serves as Health Scientist Administrator for Retirement Research, as well as Project Scientist for the Health and Retirement Study. His prior supervisory posts include Director of the Social Security Administration (SSA) Office of Policy Research and several years as the Chief of the Population and Social Process Branch at the NIA Division of Behavioral and Social Research. Earlier in his career, he served as an economist and federal project officer at SSA, conducting research on retirement and administering the SSA Retirement Research Consortium cooperative agreements. He received his Ph.D. in Economics from Syracuse University in 1997.

Ralph Rogalla is an Assistant Professor of Finance at Goethe-University, Frankfurt. His current areas of research are pension fund management and households' optimal life-cycle decision-making. He received his Diploma in Economics from Technical University Berlin and his Ph.D. in Finance from Goethe University, Frankfurt.

Susann Rohwedder is a Senior Economist at RAND, Associate Director of the RAND Center for the Study of Aging, and an affiliate member of the faculty of the Pardee RAND Graduate School. Her research focuses on the economics of aging in the areas of household consumption and saving behavior, retirement, and expectation formation. She has written on the impact of public pensions on household saving, on the adequacy of retirement resources of US households near retirement, on the effect of retirement on cognitive ability, on spending and saving patterns among the older population, on consumption- and income-based poverty measures at older ages, and on individuals' expectations about future Social Security benefits and longevity. She obtained her Ph.D. in Economics from University College London and holds Master's degrees from the University of Warwick and the Sorbonne in Paris.

Barbara A. Smith is a Senior Economist in the Office of Retirement Policy at the Social Security Administration, where her research interests focus on the intersection of Social Security and financial education. Prior to joining the Social Security Administration, she was a Senior Supervisory Policy Analyst in the Consumer and Community Affairs Division of the Board of Governors of the Federal Reserve System. Before working at the Federal Reserve Board, she established and directed the Financial Education Project at the Organisation for Economic Co-operation and Development in Paris, France. Under her supervision, the Project produced the first major international study of financial education programs. She has also worked as

xxii Notes on Contributors

a Senior Economist at the US Government Accountability Office in Washington, DC, where she was responsible for leading projects on Social Security and pension issues. Ms Smith has taught economics at Old Dominion University in Norfolk, Virginia, and worked as a research associate at Mathematica Policy Research and as a junior economist at the Council of Economic Advisers. She received her Ph.D. from the University of Michigan.

Karen E. Smith is a Senior Research Associate at the Urban Institute. Her main area of expertise is the design and implementation of microsimulation models in a social policy environment. Over the past twenty-five years, she has developed microsimulation models for Social Security, pensions, taxation, wealth and savings, labor-supply, charitable giving, health expenditure, student aid, and welfare reform. Her recent work includes estimating the income and asset accumulation patterns of the adult population, analyzing the retirement decision, evaluating the effect of disability on earnings and mortality, and using statistical matching to impute earnings, taxes, and spouse characteristics. She received her BA in Computer Science and Economics from the University of Michigan.

Ning Tang is an Assistant Professor in the Department of Finance in the College of Business Administration at San Diego State University. Her research mainly focuses on household portfolio choice, investment behavior, pension and benefit plan design, and insurance and risk management. She received her Ph.D. from the Wharton School of the University of Pennsylvania.

Stephen P. Utkus is the Director of the Vanguard Center for Retirement Research, where he conducts and sponsors research on retirement savings and retirement benefits. He is a member of the Advisory Board of Wharton's Pension Research Council, and he is currently Visiting Scholar at the Wharton School of the University of Pennsylvania. He received the BS in Computer Science from the Massachusetts Institute of Technology and the MBA in Finance from the Wharton School of the University of Pennsylvania.

Mark J. Warshawsky is Director of Retirement Research at Towers Watson, a global human capital consulting firm. He conducts and oversees research on employer-sponsored retirement programs and policies, Social Security, financial planning, and health care financing. He is a co-author of the *Fundamentals of Private Pensions, Ninth Edition*, 2009, published by Oxford University Press, and of *Retirement Income: Risks and Strategies*, forthcoming, published by MIT Press. Previously, he held senior-level economic research positions at the Internal Revenue Service, the Federal Reserve Board in Washington, DC, and TIAA-CREF, where he established

Notes on Contributors xxiii

the Paul A. Samuelson Prize. He received a Ph.D. in Economics from Harvard University and a BA with Highest Distinction from Northwestern University.

David Wray is the President of the Profit Sharing/401k Council of America (PSCA), a national, non-profit association of 1,200 companies that sponsor profit sharing and 401(k) plans for over 5 million employees. Previously, he was the 2004 Chair of the Department of Labor's ERISA Advisory Council, which advises the Secretary of Labor on benefits issues, and was a member of the Certified Financial Planner Board of Standards Advisory Board. He has produced numerous articles and publications, including *Take Control with Your 401(k)*. He received a BA from Creighton University and an MA from the University of Colorado.

Chapter 1

Retirement Security and the Financial and Economic Crisis: An Overview

Raimond Maurer, Olivia S. Mitchell, and Mark J. Warshawsky

The global financial and economic crisis has brought about numerous changes in the outlook for retirement security. This volume summarizes the lessons learned by practitioners, academics, and policy analysts, who explore how retirement planning and long-term financial security have changed following the crisis. The global financial meltdown has had important repercussions for capital market returns, labor market earnings, household retirement and consumption patterns, old-age Social Security systems, and pension plan resilience. Both defined benefit (DB) and defined contribution (DC) plans have been shaken by the recent economic shocks. Stakeholders have gained a new appreciation of the need to identify, mitigate, and finance risk faced by beneficiaries, plan sponsors, and other players in the retirement finance field, including government. In the future, improved understanding of risk is essential—and as the financial and economic collapse now confirms, risk will always play a part in retirement planning.

How the crisis affected different groups

The financial and economic crisis of 2008–9 wiped out about a quarter of US household net worth, an outcome that will have long-term impacts on retirement saving and economic behavior. As Julia Coronado and Karen Dynan (2012) note, one group heavily hit was the Baby Boomers, who, on the verge of retirement, had to alter their consumption and retirement plans as a result of these unpleasant developments. Their behavior will have substantial macroeconomic repercussions, inasmuch as this group holds a dominant share of assets. Despite the fact that persons aged 55–64 represent only 17 percent of the total US population (US Census Bureau, 2011), they command one-third of stock market assets and one-quarter of the nation's housing stock. So when household net worth as a percent of disposable income fell back to where it was in the early 1990s, 'this group

2 Reshaping Retirement Security

was particularly vulnerable to the declines in stock and housing prices', explains Dynan. 'They felt the brunt of it.'

Accordingly, it is hardly surprising that this age group also cut spending aggressively. Following the 2000 recession, the cohort aged 55–64 had the highest increase in spending, up by almost 7 percent in 2000–2. But from 2000 to 2009, this group also had the sharpest drop in spending; that is, 8 percent. Further, after-tax income for persons aged 55–64 rose 7 percent after the 2000 downturn, but it fell 4 percent, more recently. These declines were even more pronounced for the age 65+ group, which experienced a 14 percent increase in after-tax income following the prior recession, but a 4 percent drop in 2007–9. What people are consuming has also changed: younger persons cut spending on credit-related items, particularly vehicles, whereas the 55–64-year-olds made drastic cuts across the board. Most notably, they cut food expenditures almost 7 percent compared to the prior economic cycle, whereas all other age groups (except those aged 25–34) increased food spending, even during the crisis. Expenditures for apparel for persons aged 55–64 also declined 21 percent, the most for any age group during the crisis. Continuing to work has also been a form of adjustment for those who lost significant savings during the crisis and could not afford to wait for an economic rebound to recoup those losses before retirement.

Meanwhile, saving rates rose from 1 to 2 percent in the years leading up to the crisis, to 6 percent in 2010—similar to saving rates prior to the stock market run-up of the 1990s. Moreover, households along the age continuum are also borrowing less: cash-in mortgage refinancing is now outpacing cash-out transactions, whereas heading into the crisis in 2007, cash-out deals made up nearly 90 percent of refinancing transactions. Households are also taking a more conservative approach to financial investments.

These patterns are broadly echoed in a simulation analysis by Butrica et al. (2012), who point out that almost 9 million jobs were lost between December 2007 and February 2010, sending US unemployment to its highest level since World War II. Of those who lost jobs, 43 percent were out of work for more than six months, making it difficult for them to get new jobs as skills depreciated and job networks grew cold. Men, youth, and African Americans were more likely than others to become unemployed, and three-quarters of those unemployed in 2010 believe that joblessness will have a major impact on their lives. Of those out of work more than seven months, 70 percent dipped into savings, 56 percent borrowed from family or friends, and 24 percent skipped mortgage or rent payments. Meanwhile, wages stagnated, wealth declined for three-fifths of Americans, and overall poverty increased 17 percent.

To estimate the potential long-term impacts of the recession on retirement compared to what would have been expected before the

An Overview 3

downturn, the researchers undertook a microsimulation effort. Their projections indicate that incomes at age 70 will shrink by 4 percent, for persons aged 55–64 by about 1 percent, and for the younger workers (aged 25–34 in 2008) by about 5 percent. Social Security benefits depend on labor market earnings, and these benefits too are projected to decline by about 5 percent for persons aged 25–34. Overall, wealthier people will suffer greater losses to their expected retirement income in absolute terms, because they have more to lose. Johnson also notes that ‘this recession could be worse than previous ones, and the long-term impact could be worse’, due to longer-term scarring effects of unemployment on older workers.

Michael Hurd and Susann Rohwedder (2012) are concerned that older people with less time to make up for lost saving will need to alter spending and consumption. Comparing the less volatile 2001–7 period with the 2007–9 period, they show that postcrisis, spending dropped dramatically for older people. Spending falls anyway with age, but the effect was eight times larger for persons aged 51–64; for persons aged 65+, the spending decline was about half again as large, postcrisis. Their data are underscored by responses to an Internet survey where 85 percent of respondents who cut spending said they are worried about the economic future.

‘Even people not affected directly by the stock market or housing are worried about the economy’, Hurd reports. One reason is that people are very pessimistic about housing values: only one-third of the respondents expect their home to be worth more in a year. Stock market expectations are also dismal: precrisis, more than half the respondents said markets would improve the following year but a year later, in 2009, the figure dropped to just 20 percent. While this is not rational based on twenty-year historical returns, Hurd believes that people have momentum expectations influenced strongly by what has happened recently. Even those with income and assets sufficient to insulate them are still concerned about how their children will fare. Mean anticipated bequests dropped from \$535,000 in 2008 to \$436,000 in 2009. Even though the National Bureau of Economic Research has determined that the 2009–10 recession is over, Hurd adds, ‘It is certainly not over from the viewpoint of our respondents.’

Social Security comprises a major source of income for retirees, a topic examined by Fichtner et al. (2012). In particular, they investigate how peoples’ benefit-claiming patterns are changing, using birth cohort data to isolate trends. The age of first-time Social Security claims had been declining since 1997, and the percentage of beneficiaries claiming at the earliest opportunity hit a trough in 2007, with 34 percent of men eligible for Social Security payments signing up to collect their benefits. But the trend turned around at the peak of the crisis in 2008, when the

4 Reshaping Retirement Security

percentage rose to 35 percent; a year later it was up again, to 36 percent. The researchers also find a correlation between state unemployment rates and the number of beneficiaries opting to take benefits early.

Defined contribution plans during the downturn

The economic downturn severely affected DC plan participants. Going into the crisis, David Wray (2012) observes that DC plans were enjoying momentum: the 2006 Pension Protection Act (PPA) made permanent several favorable changes that first went into effect in 2001, and this bill cleared the way for auto-enrollment in DC plans. In his view, DC plans were quite resilient over the period 2006–10: no DC plans were terminated except at companies that went out of business. Moreover, three-quarters of all plans maintained employer contribution levels; only 15 percent suspended contributions, while 4 percent reduced and 5 percent boosted payments in 2009. The following year, these figures shifted to 78, 9, 4, and 9 percent, respectively. The number of plans offering immediate eligibility to new hires and automatic enrollment also rose steadily throughout the crisis and many plans added investment allocation support. The share of plans offering target-date funds (TDFs) rose from 43 to 79 percent over 2006–10, representing extremely rapid change in the normally slow-to-evolve pension world.

Wray also points out that DC participants stayed the course; in 2006, plans experienced a 2.5 percent resignation rate, rising to 3.1 percent in 2008, dropping back to 2 percent in 2010. Participants with loans against their 401(k) holdings declined slightly during the crisis, from 24 percent in 2006 to 23 percent in 2009. DC plan assets also responded to the crisis: in 2006, DC assets stood at \$3.6 trillion, fell to \$2.7 trillion in 2008, and recovered back to \$3.9 trillion, a record high. ‘Clearly there was no massive flight from the system by participants’, Wray observes. Yet the volatility experienced during this period appears to have had an impact on asset allocation. DC participants had 73 percent of their investments in equities and 27 percent in fixed income investment in 2006, which shifted to 68 and 32 percent, respectively, in 2010. Rather than finding that DC retirement saving vehicles failed, he argues that the DC plan passed its stress test.

To gain more insight into DC participant behavior during the crisis, Ning Tang et al. (2012) examine how trading patterns changed in 401(k) plans. Drawing on Vanguard data, the authors point out that only 2.5 percent of plan participants traded between January 2006 and March 2009. Nevertheless, trading did rise 23 percent in the second half of the period, beginning in September 2008 at the height of the crisis. They also find a strong shift away from equities: flows to stock declined almost

An Overview 5

4 percent, down 1 percent from the precrisis phase, and 11 percent after the shock hit. On examining characteristics of people who traded, they conclude that the average plan trader was a 46-year-old male who had accumulated \$115,000 in assets during ten years in the plan. During the crisis, however, more women with lower total wealth and trading experience began to trade.

The researchers also focus on trader motivation and discover that market volatility boosted investor awareness of the risk associated with equities. Prior to the crisis, many traders were apparently momentum-driven, but during the downturn they engaged in some contrarian behavior—‘they were trying to buy on the dips’, explains Tang. ‘This is a surprise.’ It also appears that when plan participants receive their quarterly statements, this also shaped trading patterns. Nevertheless, they conclude that inertia dominated trading behavior in 401(k) plans, overall.

The long-term impacts of the financial and economic crisis on DC plan participants cannot yet be evaluated, so one group of analysts has modeled what these outcomes might be. Using a dynamic programming model, Jingjing Chai et al. (2012) explore how people of different ages will respond to the shocks they have experienced in consumption, employment, and retirement over their remaining lifetimes. The researchers focus on both short- and long-term ‘scarring’ effects on the young and the middle-aged; that is, those aged 20 and 55 when the shock occurred. The model inputs data on labor and capital markets, work and retirement, and housing to gauge the impact on consumption, leisure, asset allocation, retirement decisions, and annuitization. The authors predict that most workers will remain employed longer: for those currently in their 20s and in their 50s, the average retirement age is predicted to rise by more than a year.

Compared to what would have been expected in ‘normal’ periods, they also project both short- and long-term changes in asset allocation. For those currently aged 20, equity investments will fall by nearly 20 percent initially and return to normal levels by age 30. Thereafter, when this cohort is aged 40–80, its equity weighting is predicted to rise by 5–10 percent and to 10 percent by age 80. For those currently aged 55, the equity fraction is predicted to fall by nearly 10 percent right away, and then rise by age 60 and beyond. As for consumption, the model predicts a larger consumption loss for young people in the earlier years. Yet, explains Maurer, there is a substantial, persistent consumption loss for both age groups. ‘The young will compensate for the consumption drop by enjoying more leisure, but the older group will consume less and have to work more.’

6 Reshaping Retirement Security

How defined benefit plans managed during the crisis

Many concerned with retirement security have been interested in how DB retirement programs fared during the crisis. The downturn had a dramatic impact on corporate, single-employer DB pensions, according to Mark J. Warshawsky's analysis (2012) of funding levels, contributions, and proposed reforms. Using Fortune 1000 data, he shows that aggregate funding rose to 106 percent in 2007, fell to 77 percent in 2008, and then edged slightly up to 83 percent in 2010. The improvement was due to a rise in asset values, but it was tempered by declines in the discount rate and the effect of that change on pension liabilities. And though funding levels are up, Warshawsky notes that there's still a long way to go. He also compares asset allocation patterns in DB and DC plans through the crisis. Starting in the mid-1990s, both plan types began to increase equity holdings; by 2006, each had about 70 percent of assets in equities. In 2007, the paths diverged, with equities rising to more than 70 percent of DC assets, while the fraction in stock dropped steadily for DB plans to under 50 percent by 2009. Equities rose again as a percentage of DC plan assets in 2009, along with share prices, illustrating that the decline for DB plans was a conscious choice by plan sponsors to de-risk their plans.

'We are still grappling with the issue of who should bear pension plan risk', Warshawsky indicates. He suggests that DB plan contributions will need to be boosted in the future and notes that reform proposals include new types of plans that split the difference between the employer and employee, regarding where risks are borne. This is already happening, in light of the dramatic shift in plan type offered. In 1998, new hires were offered a DB plan at seventy-two of the Fortune 100 companies (sixty-six traditional DBs and six hybrids). Today, only fourteen offer a traditional DB plan (and seventeen offer a hybrid plan). Meanwhile, the number of companies offering only a DC retirement program to new hires has increased from twenty-eight to sixty-nine.

Multiemployer plans are the subject of an analysis by Judith F. Mazo and Eli Greenblum (2012), which examines how union plans used the PPA of 2006 to stabilize their finances. The authors identify three categories they call the red, yellow, and green zones: plans with sound finances all deemed 'safe' and in the green zone; plans at least 80 percent funded and facing a deficit in seven years are classified as 'endangered' and in the yellow zone; and plans in 'critical' danger of being deficient, or insolvent, in four to five years fall into the red zone. Trustees of yellow- and red-zone plans had to establish rehabilitation plans. Of the more than 400 plans examined, 9 percent were in the red zone in 2008, rising to 29 percent in 2010; 80 percent were in the green zone in 2008, falling to just over half 53 in 2010; and 11 percent of the firms were in the yellow zone in 2008, with

An Overview 7

18 percent now in this category. Nonetheless, of the plans in the red zone, the majority were progressing to recovery. Of those still facing insolvency, most were in dying industries or overwhelmed by large numbers of retirees. In order to move forward, many plans reduced benefits and asked employees to pay a greater share of contributions.

Hybrid plans blend characteristics of both DB and DC pensions, and they have become more popular following passage of the PPA, according to Robert Clark et al. (2012). The first US hybrid pension plan was created in 1985 by Bank of America, and this plan type enjoyed a surge during the 1990s. Companies sought to convert to hybrid plans due to changes in accounting rules, employee preferences for more mobile pensions, compensation packages de-emphasizing retirement, and some DB plan overfunding. Yet the trend was halted by lawsuits in the late 1990s arguing that these plans violated federal pension laws and statutes regarding age discrimination. In 2006, with passage of the PPA, hybrid plans received safe harbor from age discrimination claims. The researchers contend that the funded status of DB plans of firms was not an important predictor of the conversion to hybrid plans. Instead, companies with a smaller market capitalization but large pension obligations and assets relative to capitalization were more likely to convert to a hybrid.

The financial crisis has also affected pensions in other countries. For instance, in the Netherlands, it forced a profound reexamination of risk and guarantees in the country's occupational retirement plans. Bovenberg and Nijman (2012) explain that the Netherlands has a first-tier government pension to protect against poverty, on top of which occupational pension funds provide a second tier of retirement income linked to earnings. Dutch occupational pensions are of the DB variety, and they historically enjoyed high levels of funding with assets amounting to 130 percent of liabilities in 2000. During the crisis, however, pension funding ratios fell due, in part, to a drop in asset prices and also to a fall in nominal interest rates. As a result, occupational retirement pension funds reduced nominal benefits that many beneficiaries had thought were 'guaranteed'. In fact, as the authors point out, it has become clear that the participant is the ultimate risk-bearer.

The financial crisis has triggered reforms to preserve the Dutch DB-style plans. Many of their pensions have asset buffers that enable risk-sharing across generations and smooth out fluctuations in financial markets. Nonetheless, these mechanisms also have problems in that they lack transparency and do not make clear who bears the burden of funding shortfalls. Inasmuch as reforms implemented in 2010 restricted raising premiums as a way to absorb risk, the authors note that 'participants will have to share in shocks to the system one way or another'.

8 Reshaping Retirement Security

Public sector pensions have also faltered in the wake of the crisis, as pointed out by Andrew Biggs (2012). His analysis asks whether public pension funds have altered their portfolios to adjust the risk assumed after losing nearly \$1 trillion in asset value during the crisis. The debate is driven by the fact that public employee pensions were already underfunded going into the crisis and assets are roughly 25 percent below levels in 2007. Moreover, expected asset return levels are set by state legislatures, and if a legislature sets the discount rate at 8 percent (typical in the public sector), plan administrators are driven to find a portfolio that can deliver that return—at the same time that projected asset returns have declined.

To determine how public plans reacted to the downturn, Biggs studies thirty major plans representing about half of all the public pension assets under management. To determine whether plans have ‘doubled down’ on risk in order to catch up on returns, reduced risk to preserve funding, or held steady, he looks at asset allocations pre- and postcrisis. In 2007, the plan portfolios were heavy on equities, with a median target of 57 percent; US bonds were 26 percent of assets; and alternative investments were about 8 percent. In 2010, equities had declined to 52 percent, bonds were stable, and alternative investments rose significantly to 15 percent. In all, fourteen of the plans under study boosted increased risk, five reduced risk, and eleven held steady. Mean returns rose from 6.35 percent in 2007 to 6.51 percent in 2010. Biggs concludes that higher risk may do little to help with public plan shortfalls.

Conclusion

There is little doubt but that the financial and economic crisis—and its continuing fallout—profoundly shook the foundations of retirement security in America and around the world. When pressed to recommend reforms postcrisis, many would recommend enhancing financial advice for plan participants, emphasizing flexibility, and the positive effect of working another one or two years to make up for investment losses in the downturn. Adding to this is the great and continuing need for financial education, essential as the retirement system moves increasingly toward personal account pensions.

But perhaps most important of all is the need for greater understanding of risk throughout the retirement security system, along with new approaches to reengineering retirement pensions. This includes revisiting asset allocation patterns and embedding rebalancing efforts to better ensure retirement security. This volume outlines some successes and some failures, along with the lessons learned.

References

- Biggs, A. G. (2012). “How Have Public Sector Pensions Responded to the Financial Crisis?”, in R. Maurer, O. S. Mitchell, and M. J. Warshawsky, eds., *Reshaping Retirement Security: Lessons from the Global Financial Crisis*. Oxford, UK: Oxford University Press.
- Bovenberg, L., and T. Nijman (2012). “Collective Pensions and the Global Financial Crisis: The Case of the Netherlands”, in R. Maurer, O. S. Mitchell, and M. J. Warshawsky, eds., *Reshaping Retirement Security: Lessons from the Global Financial Crisis*. Oxford, UK: Oxford University Press.
- Butrica, B. A., R. W. Johnson, and K. E. Smith (2012). “The Potential Impact of the Great Recession on Future Retirement Incomes”, in R. Maurer, O. S. Mitchell, and M. J. Warshawsky, eds., *Reshaping Retirement Security: Lessons from the Global Financial Crisis*. Oxford, UK: Oxford University Press.
- Chai, J., R. Maurer, O. S. Mitchell, and R. Rogalla (2012). “Lifecycle Impacts of the Financial Crisis on Optimal Consumption-Portfolio Choices and Labor Supply”, in R. Maurer, O. S. Mitchell, and M. J. Warshawsky, eds., *Reshaping Retirement Security: Lessons from the Global Financial Crisis*. Oxford, UK: Oxford University Press.
- Clark, R. L., A. Glickstein, and T. Hill (2012). “Adopting Hybrid Pension Plans: Effects of Economic Crisis and Regulatory Reform”, in R. Maurer, O. S. Mitchell, and M. J. Warshawsky, eds., *Reshaping Retirement Security: Lessons from the Global Financial Crisis*. Oxford, UK: Oxford University Press.
- Coronado, J. and K. Dynan (2012). “Changing Retirement Behavior in the Wake of the Financial Crisis”, in R. Maurer, O. S. Mitchell, and M. J. Warshawsky, eds., *Reshaping Retirement Security: Lessons from the Global Financial Crisis*. Oxford, UK: Oxford University Press.
- Fichtner, J. J., J. W. R. Phillips, and B. A. Smith (2012). “Retirement Behavior and the Global Financial Crisis”, in R. Maurer, O. S. Mitchell, and M. J. Warshawsky, eds., *Reshaping Retirement Security: Lessons from the Global Financial Crisis*. Oxford, UK: Oxford University Press.
- Hurd, M., and S. Rohwedder (2012). “Effects of the Economic Crisis on the Older Population: How Expectations, Consumption, Bequests and Retirement by the Older Population Responded to Market Shocks”, in R. Maurer, O. S. Mitchell, and M. J. Warshawsky, eds., *Reshaping Retirement Security: Lessons from the Global Financial Crisis*. Oxford, UK: Oxford University Press.
- Mazo, J. F. and E. Greenblum (2012). “Multiemployer Pension Plans in the Financial Crisis”, in R. Maurer, O. S. Mitchell, and M. J. Warshawsky, eds., *Reshaping Retirement Security: Lessons from the Global Financial Crisis*. Oxford, UK: Oxford University Press.
- Tang, N., O. S. Mitchell, and S. P. Utkus (2012). “Trading in 401(k) Plans during the Financial Crisis”, in R. Maurer, O. S. Mitchell, and M. J. Warshawsky, eds., *Reshaping Retirement Security: Lessons from the Global Financial Crisis*. Oxford, UK: Oxford University Press.
- US Census Bureau (2011). *Age and Sex Composition 2010*. 2010 Census Briefs. Washington, DC: US Census Bureau. <http://www.census.gov/prod/cen2010/briefs/c2010br-03.pdf>

10 Reshaping Retirement Security

- Warshawsky, M. J. (2012). “Corporate Defined Benefit Pension Plans and the Financial Crisis: Impact and Sponsor and Government Reactions”, in R. Maurer, O. S. Mitchell, and M. J. Warshawsky, eds., *Reshaping Retirement Security: Lessons from the Global Financial Crisis*. Oxford, UK: Oxford University Press.
- Wray, D. (2012). “A Stress Test for the Private Employer Defined Contribution System”, in R. Maurer, O. S. Mitchell, and M. J. Warshawsky, eds., *Reshaping Retirement Security: Lessons from the Global Financial Crisis*. Oxford, UK: Oxford University Press.