

## MIT Industrial Liaison Program Faculty Knowledgebase Report

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Finance at MIT

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July 13, 2021 11:00 am - 12:30 pm

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Asset allocation for typical American investors: innovations, changing behavior, and the design of optimal strategies

Jonathan A. Parker

Robert C. Merton (1970) Professor of Financial Economics



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Jonathan A. Parker is the *Robert C. Merton (1970) Professor of Finance* and codirector of the MIT Golub Center for Finance and Policy. He has held numerous service positions and consulting positions, including Area Head of Economics, Finance and Accounting at Sloan, editor of the NBER Macroeconomics Annual, and special adviser on Financial Stability for the Office of Financial Stability in the U.S. Department of the Treasury in 2009. He currently serves an economic adviser for the Congressional Budget Office, a visiting scholar at the Federal Reserve Bank of Boston, an academic advisor to the JP Morgan Chase Institute, a research associate at the National Bureau of Economic Research, and a member of the Board of Editors of the *American Economic Review*. An expert in finance, macroeconomics, and household behavior, Parker has published widely on topics such as macroeconomic risks and asset returns, fiscal stabilization policy, national saving, household financial decisions, the measurement of business cycles, and modeling human economic behavior.

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Over the past four decades, there has been a dramatic shift in the financial landscape faced by the typical American investor. The broad-based shift from defined-benefit pension plans to defined-contribution (DC) plans has moved the responsibility for asset allocation from pension fund managers to ordinary Americans. More than half of all American households now accumulate significant financial wealth by the time they retire. This shift has been accompanied by changes both in financial regulation and in the financial products available to retail investors, and in particular the rise of target-date or lifecycle funds designed to provide investors with easily-accessible age-appropriate allocations across asset classes. That is, following common portfolio advice, these funds hold given fractions of their assets in stocks and bonds, mostly stocks when the investor is far from retirement, and an increasing share of bonds as the investor approaches their expected retirement date, the 'target date.'

The rise of target date funds – driven by both financial regulation and the 2006 Pension Protection Act -- has been accompanied by a large change in the way typical Americans invest. Analyses of anonymized big data on individual financial accounts show that the typical Americans investor now holds much more of their portfolio in stocks and less in bonds than previously. This large change is partly driven by target date funds, but the rise in investment in stocks is more pronounced and broader than just that caused directly by target date funds, suggesting that the implicit portfolio advice in these funds spread beyond their own direct reach.

The rise of target date funds has not only changed the investment behavior of typical Americans, but it has shifted the dynamics of the stock market. While not an original intention of this financial innovation, target date funds have moved a significant fraction of US retail investors to an actively 'market-contrarian' trading strategy that trades against aggregate stock market momentum and fluctuations. Traditionally, many retail investors are either passive – letting their portfolio shares rise and fall with the returns on different asset classes – or they are active and tend to reallocate their assets into asset classes or funds with better past performance, a behavior known as 'positive feedback trading' or 'momentum trading' that can amplify price fluctuations. In contrast, by rebalancing to maintain age-appropriate asset allocation, target date funds sell equity after good performance and buy equity after bad. This has changed investor flows across mutual funds held by target date funds and has changed the returns of the individual stocks that they hold.

But how should typical working Americans invest? This question can now be answered more accurately and robustly and in a more customized manner than ever before. Machine learning methods are being developed to solve for optimal saving and portfolio choices in complex non-linear – one might even say 'realistic' -- lifecycle portfolio models. These solutions can be used to design better funds, or to improve robo-advising tools to provide prescriptive advice on saving and portfolios for typical American retirees.

11:35 AM - 11:45 AM

Master of Finance Program - Video time stamp starts at: 31.27

Heidi Pickett  
Assistant Dean, MIT Sloan Master of Finance program

The MIT Sloan Master of Finance (MFin) Program is a top-ranked, STEM program, which emphasizes a foundation in how markets work and a rigorous curriculum engineered around the most advanced financial and quantitative theories and practices. As innovation, regulation and globalization continue to drive change, MFin students are prepared to exceed your expectations today and continue to add value tomorrow.

11:45 AM - 11:55 AM

MicroMasters Program in Finance - Video time stamp starts at: 38.16

Egor Matveyev  
Senior Lecturer and Research Scientist in Finance  
Executive Director, MicroMasters Program in Finance

The MITx MicroMasters® Program in Finance helps learners around the world meet the complex demands of today's global finance markets with 5 courses developed and delivered by MIT Sloan faculty. The program offers recent graduates, early to mid-stage professionals, and other individuals interested in pursuing a career in finance, an opportunity to advance in the finance field or fast-track an MIT Sloan Master of Finance degree through a rigorous, comprehensive online curriculum, delivered by the world-renowned MIT Sloan School of Management.

SeLFIES – A Globally Applicable Bond Innovation to Improve Retirement Funding and Support Other Policy Objectives - Video time stamp starts at: 46.14

Robert C. Merton

School of Management Distinguished Professor of Finance



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Robert C. Merton is the School of Management Distinguished Professor of Finance at the MIT Sloan School of Management and John and Natty University Professor Emeritus at Harvard University since 2010. He was the George Fisher Baker Professor of Business Administration (1988–98) and the John and Natty McArthur University Professor (1998–2010) at Harvard Business School. After receiving a PhD in Economics from MIT in 1970, Merton served on the finance faculty of MIT's Sloan School of Management until 1988 at which time he was J.C. Penney Professor of Management. He is currently Resident Scientist at Dimensional Fund Advisors Inc.

Merton received the Alfred Nobel Memorial Prize in Economic Sciences in 1997 for a new method to determine the value of derivatives. He is past president of the American Finance Association, a member of the National Academy of Sciences, and a Fellow of the American Academy of Arts and Sciences.

Merton has also been recognized for translating finance science into practice. He received the inaugural Financial Engineer of the Year Award from the International Association for Quantitative Finance (formerly International Association of Financial Engineers), which also elected him a Senior Fellow. He received the 2011 CME Group Melamed-Arditti Innovation Award and the 2013 WFE Award for Excellence from World Federation of Exchanges. A Distinguished Fellow of the Institute for Quantitative Research in Finance ('Q Group') and a Fellow of the Financial Management Association, Merton received the Nicholas Molodovsky Award from the CFA Institute. He is a member of the Halls of Fame of the Fixed Income Analyst Society, Risk, and Derivative Strategy magazines. Merton received Risk's Lifetime Achievement Award for contributions to the field of risk management and the 2014 Lifetime Achievement Award from the Financial Intermediation Research Society. He received the 2017 Finance Diamond Prize from Fundación de Investigación IMEF.

Merton received a BS in Engineering Mathematics from Columbia University, a MS in Applied Mathematics from California Institute of Technology, and a PhD in Economics from Massachusetts Institute of Technology and numerous honorary degrees from US and foreign universities.

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The combination of rapidly aging populations and increasing life expectations have created a global challenge for the funding of retirement. As is evident from the trend of the last decade to cap or outright move away from PAYGO and defined-benefit retirement plans, individuals are becoming increasingly responsible for funding and managing a larger proportion of their retirement through personal saving and defined-contribution plans. *SeLFIES* is a proposed innovation to enable people to do so and improve their retirement outcomes. *SeLFIES* also offer a potential large-scale efficient source for funding Sustainable Development Goals because its payout pattern matches the cash flow pattern from infrastructure investments essential for SDGs. In addition to matching the payoff pattern, *SeLFIES* would be local funding for local projects and so would not have local currency risk experienced with foreign bond buyers.

*SeLFIES* (Standard of Living Indexed Forward-starting Income-only Securities) is a bond designed to replicate the pension-like payout pattern desired by individuals in retirement. Purchased during work life, they have a deferred start of payouts until a specified future date (anticipated retirement date) and from that date on there are annual level payouts with indexing, until a specified ending date (a bit longer than life expectancy at retirement). *SeLFIES* would be issued as a series with different *annual starting dates*. *The payouts are indexed to aggregate per capita consumption, so that the holder is hedged against both consumption inflation and standard of living change risks.* Like an ordinary bond, *SeLFIES* can be sold in the market or redeemed by the issuer at any time. It is designed to work in any country with a government bond market.

Designed to require only knowledge that individuals already have, *SeLFIES* address the major challenge of a lack of financial literacy and high transactions cost. The only information the saver needs to select the correct bond is their anticipated retirement date. Once the bond is purchased, there are no further transactions required because there are no coupon payments to reinvest and its payouts match those desired for a pension-like pattern in retirement. Therefore transactions costs and fees are minimized. Complex decisions of how much to save, how to invest, and how to draw down are simply folded into an easy calculation of how many bonds to buy to meet their retirement goal. *SeLFIES* can be nearly seamlessly coordinated to exchange for a life annuity with the same payout level at

