

Are Public Plan Investment Choices Different? *Discussion*

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Source: Princeton Headshots

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- ❑ These are the personal views of the presenter and do not represent the views of any of the organizations he is affiliated with.
- ❑ Nothing contained in this presentation is meant to serve as investment advice and investors are urged to seek appropriate counsel prior to making any decisions.

Agenda: Public Plan Investment Choices

- ❑ Common Aspects of Both Papers
- ❑ Background Comments
- ❑ Paper 1
- ❑ Suggestions for Extending Work
- ❑ Paper 2:
- ❑ Suggestions for Extending Work
- ❑ Q&A



Common Elements of Both Papers

- ❑ Focused on Public Plans – one just on US Public DBs
- ❑ Focused on Investment Decisions – Macro and Micro
 - ❑ Paper 1 – on SAA (accounts for 90% of fund risk)
 - ❑ Paper 2 – on individual asset/manager selection
- ❑ Both have to deal with the challenges of data – limited time period
 - ❑ Small data set = Noise or lack of skill?
- ❑ Both examine how low interest rates may have impacted investment choices
- ❑ Cost of decisions: risk-shifting and tax payer subsidizing (bad decisions)

Background on DB Pension Funds

- Involve inter-generational risk-sharing; also, lots of embedded optionality
- Partially funded = a mix of full-funded and PAYGO
 - Formula for determining the mix is in Modigliani-Muralidhar 2004
- Funded Status = Assets/Liabilities
- Until recently, most US Pension Funds used MPT/CAPM to manage assets
- MPT/CAPM assumes that Liabilities are deterministic (discount by $r(F)$)
 - Stochastic liabilities = Relative Asset Pricing Model Muralidhar-Ohashi-Shin 2014
 - This simple assumption has enormous impact on retirement security globally
- Post the Tech Bubble regulation for US corporates changed = LDI
 - No change for public DB pensions
- There is a high value to the option to default/transfer wealth to next generation
 - Honey I Shrunk the Kids' Wealth....

The Liability Conundrum with Public Pension Plans

- ❑ A corporate and public DB pension with identical pension cash flows can have different liability valuations
- ❑ Two public DB pension plans with identical cash flows can have different liability valuations
- ❑ Public funds discount liabilities with expected returns – but we have no ability to forecast them
- ❑ The CIO of a public fund can never hedge their liabilities – as there is no portfolio that guarantees the “expected return”

Failure of Theory and Impact on Public Fund Management

- ❑ Ignoring the missing “liability” assumption in MPT/CAPM
 - ❑ Complete inability to forecast expected returns, correlations, volatilities,
 - ❑ Board members not always financially sophisticated

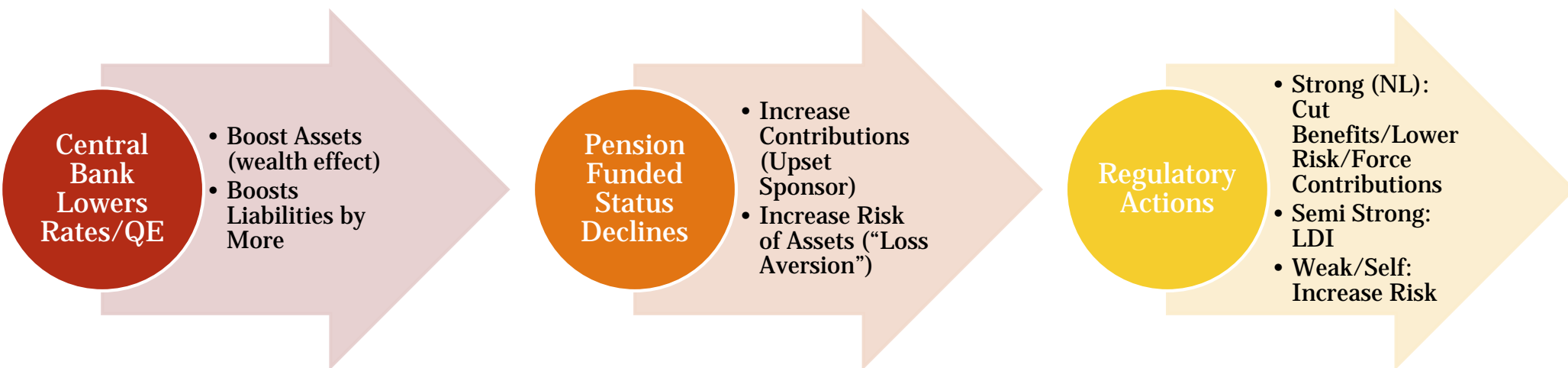
- ❑ Asset labels and Board presentations must be separated from economic reality

- ❑ Most CIOs/consultants know that “diversification” is an easier case to make in theory than in practice

- ❑ Easiest to include a new asset that has an existing asset’s structure
 - ❑ Make infrastructure like a PE fund
 - ❑ *“Better to fail conventionally than succeed unconventionally”*

- ❑ Known devil of product is often only way to get new assets into portfolios

Failure of Institutions: Three Key Entities in Pension Picture

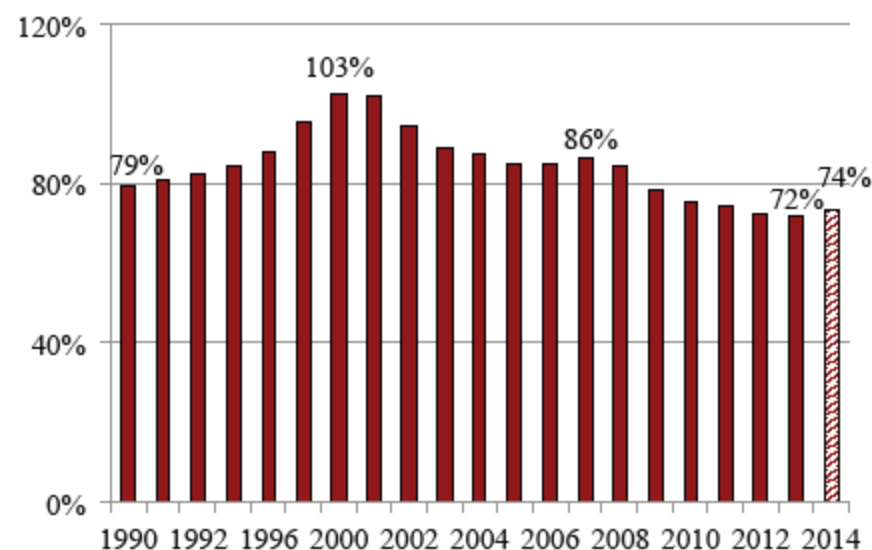


- ❑ Unintended consequence of lowering rates = Lower relative wealth = riskier system
 - ❑ [Monetary Policy: It's All Relative – Merton-Muralidhar 2015](#)
- ❑ Benefit to increasing risk for a public fund is two-fold
 - ❑ [Can punt your way out of a problem; higher discount rate on liabilities](#)
- ❑ My bias: risk shifting has less to do with debt (current claimant) than with inter-generational issues (as no one at the table from a future generation – see Social Sec)
- ❑ Less Liquid Allocations – Not marked-to-market (enormous value to sponsor)
 - ❑ [Look also at the difference in liability duration between Public and Private Funds](#)

Chronology of Events: Funded Status Over Time

- ❑ 1990 – 2000: Stock market on a tear
- ❑ 2000-2002: Tech Bubble bursts
 - ❑ Asset-liability risk exposed (i.e., using MPT/CAPM for an Asset-Liability problem)
 - ❑ Central banks lower rates
- ❑ 2002-2007: Equity market rallies – funded status declines
 - ❑ Investment in hedge funds; private equity
 - ❑ Impact of monetary policy
 - ❑ PPA passed - 2006
- ❑ 2008: GFC – Illiquid assets also impacted
 - ❑ Recall: Harvard, Yale etc. cash strapped
 - ❑ Additional QE, Twist etc – long rates decline further
- ❑ 2019: Fed alters policy on rates
 - ❑ Increasing allocation to illiquid assets
 - ❑ Loaded up on credit and private assets

FIGURE 1. STATE AND LOCAL PENSION FUNDED RATIOS UNDER GASB 25 STANDARDS, FY 1990-2014

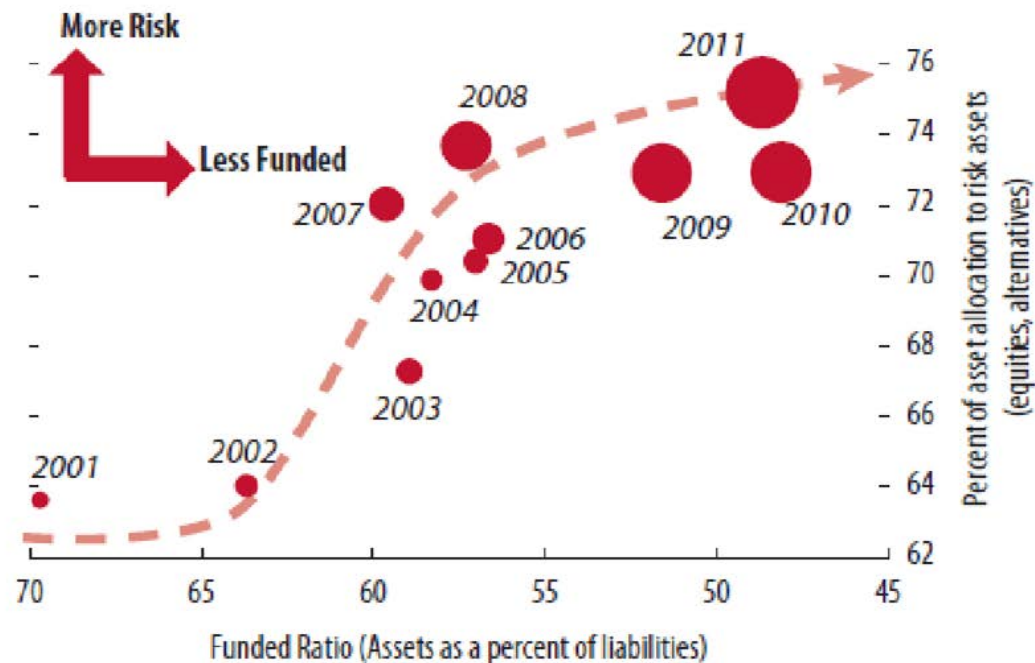


Note: 2014 involves projections for about one third of plans.
Sources: 2014 actuarial valuations; *Public Plans Database* (PPD) (2001-2014); and Zorn (1990-2000).

Some Interesting Charts: Funded Status and Risk

- Very simply – as funded status declined, allocation to risky assets rose (a form of loss aversion?)

Figure 1.54. Risk Tolerance for Weakest 10 Percent of U.S. Public Pension Funds



Sources: Boston College Center for Retirement Research; and IMF staff estimates.
Note: Size of bubble represents allocation to alternative investments; 2011 is 25.5 percent.

Survey of 32 Global Fund CIOs: Modern Prospect Theory

- ❑ If their funded status increased from being underfunded to being 120% funded,
 - ❑ 16 (50%) said they would “Increase their allocation to the ‘safest’ asset”,
 - ❑ 4 (13%) would “Do nothing,” and the balance of responses
 - ❑ “Maintain asset allocation” to “Rebalance back to the SAA” to being opportunistic.
 - ❑ This is a marked difference in responses when compared to the pure asset question.

- ❑ If their funded status declined from being overfunded to being 80% funded,
 - ❑ 13 (44%) would “Increase their allocation to the risky asset”,
 - ❑ 7 (22%) would “Do nothing” and the balance of responses were
 - ❑ similar to the increase in asset value responses.
 - ❑ This is a marked difference in response when compared to the pure asset question.

- ❑ If they went from being underfunded to being fully funded,
 - ❑ 13 (44%) said they would “Increase their allocation to the ‘safest’ asset”,
 - ❑ 8 (25%) would “Do nothing.”
 - ❑ Full funding appeared to indicate a point of less risk aversion than over funding.

Paper 1 Summary: Three Key Tests and Results

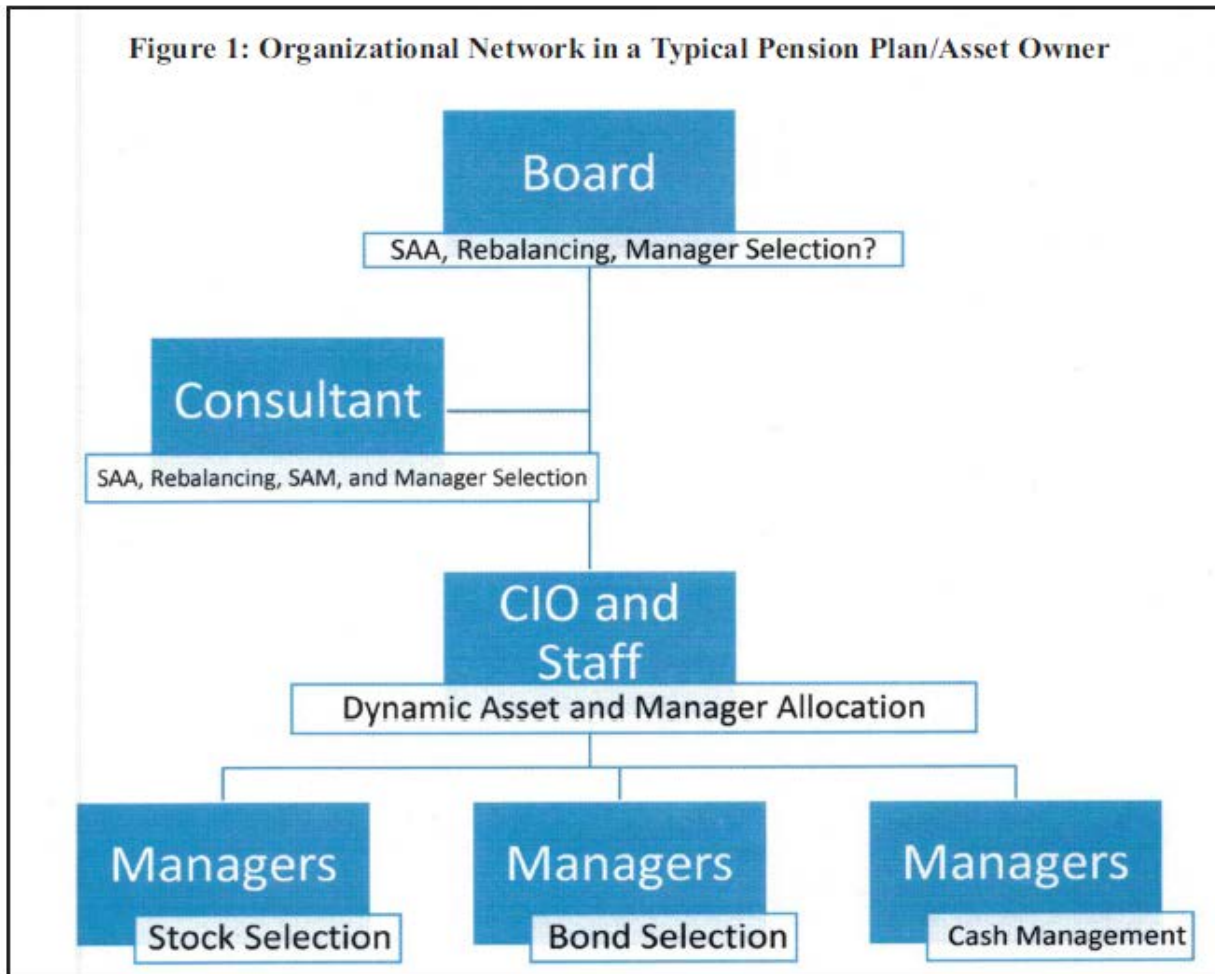
- ❑ Q.1: Do Lower Rates Increase Risk Taking? Yes
- ❑ Q.2: Does Lower Funded Status Increase Risk Taking? Yes
- ❑ Q.3: Do weaker State Finances Increase Risk Taking? Yes
- ❑ Paper is very strong on methodology of the tests
- ❑ Introduce two key innovations: (a) more holistic measure of risk; and (b) attempt to discount liabilities from a more finance perspective
- ❑ Implications for Policy: Quantify the impact of bad markets on state finances – quite meaningful
- ❑ Interesting implications of potentially marking-to-market liabilities

Summary for Paper 1: Ideas to Extend the Paper

- Data difficulties: But can the analysis be extended when FS was rising too?
 - Pre-2000, both corporate and public funds had rising FS, but few reduced risk
- Include corporate pension funds as a control variable – regulatory impact?
 - Clearly, these funds adapted their asset allocation (see Aubry et al 2018)
- Additional control variable for impact of regulation – the Netherlands?
 - Funded status $\geq 100\%$ despite a much worse interest rate situation
- Would like to see Policy Impact focus on regulation and monetary policy too
 - Assets are negatively correlated to liabilities – cannot end well....
- Is there a way to quantify the value of infrequent marking-to-market?
 - Break out alternatives – risk may be understated – increasing allocations to assets

Public Pension Plan Governance: Multiple P-A Challenges

Figure 1: Organizational Network in a Typical Pension Plan/Asset Owner



- ❑ Board – not always financially trained
- ❑ CIO and Staff are both agent (to Board) and principal (to Managers)
- ❑ Often requires Consultant approval
- ❑ The “IBM” problem – the value of intermediation
- ❑ Time horizon shrinks with P-A challenges

Public Pension Plan Results: Interesting Pattern

- ❑ Aubry *et al.* (2018, p. 2), in examining 180 public plans over the 2001–2017 period: “over this same 17-year period, all plans, regardless of their cohort, have underperformed relative to their actuarial investment assumptions, with underperformance being greater for the lower-funded plans.”
- ❑ Aubry, J. P., Crawford, C., and Wandrei, K. (2018). “Stability in Overall Pension Plan Funding Masks a Growing Divide,” *Center for State and Local Government Excellence Issue Brief*.

Paper 2 Summary: Key Tests and Results

- ❑ What: investigate the characteristics of infrastructure as an asset class from an investment perspective of a limited partner. Is it a true diversifier?
- ❑ Why: non U.S. institutional investors gain exposure to infrastructure assets through a mix of direct investments and private fund vehicles, U.S. investors predominantly invest in infrastructure through private funds
- ❑ How/Innovations: stream of cash flows delivered by private infrastructure funds to institutional investors is very similar to that delivered by other types of private equity, as reflected by the frequency and amounts of net cash flows
- ❑ Results: Public investors perform worse than private institutional investors in their infrastructure fund investments, although they are exposed to underlying deals with very similar project stage, concession terms, ownership structure, industry, and geographical location.
- ❑ By selecting funds that invest in projects with poor financial performance, public funds have created an implicit subsidy to infrastructure as an asset class

Paper 2 Summary: Four Potential Explanations

- ❖ Public investors could gain exposure to less risky infrastructure investments than other institutional investors and these safer assets will deliver lower returns
- ❑ The differences in exit rates and performance could be due to differences in preferences for gaining long-term exposure to infrastructure assets
- ❑ The underperformance of public investors could be either due to lower skill in the selection of funds, or due to limited access to the best-performing infrastructure funds
- ❑ Public investors could underperform because they are more susceptible to non-financial objectives when investing in infrastructure.

The Diversification Myth

- ❑ Assets provide good risk-adjusted returns and are uncorrelated
 - ❑ We have little ability to forecast returns, correlations or volatility
 - ❑ Does not stop investors from using these assumptions to make allocations
- ❑ Investors pick the asset they want to invest in
 - ❑ The assumptions often then fit the results the clients want
- ❑ Current allocation to private/illiquid assets on the rise (paper 1)
 - ❑ Investors searching for yield
 - ❑ Not always achieving it – not held accountable for the results
 - ❑ Impact of low rates on this outcome for public investors?
- ❑ MPT is a great theoretical model – Investing is a cash-flow matching exercise
 - ❑ Efficient frontier is nice in theory – irrelevant in practice
 - ❑ A bigger subsidy would similarly have been investing in foreign equity – grossly underperformed US equity and pretty much perfectly correlated.

The Danger of the “Public Fund” Trope

- ❑ There are Good and Bad Public Funds, just like there are Good and Bad Endowments
 - ❑ Dangerous to paint all public funds’ manager selection decisions with one brush
- ❑ Unlike the Macro perspective, need to identify what issue drives outcomes
 - ❑ Macro = regulation
 - ❑ Public pensions different from SWFs
 - ❑ Lots of variables at play
 - ❑ Governance, Consultants, Resources
- ❑ “Governance alpha”
 - ❑ Can be positive or negative



Harvard Blew \$1 Billion in Bet on Tomatoes, Sugar, and Eucalyptus...

[https://www.bloomberg.com/news/articles/2018-03-01-harvard-blew-1-billion-in-...](https://www.bloomberg.com/news/articles/2018-03-01-harvard-blew-1-billion-in-bet-on-tomatoes-sugar-and-eucalyptus)

Mar 1, 2018 - Harvard, which manages \$37.1 billion, has said those investments produced strong returns but now face “significant challenges.” ... Harvard over the past decade ended June 30 posted a 4.4 percent average annual return, among the worst of its peers.

Summary for Paper 2: Ideas to Extend the Paper

- Governance alpha – in this case, can that explain negative alpha?
 - Not all public plans are the same – also, many corporates and endowments have poor governance
 - Is negative alpha because of board composition, consultants, delegation etc?
 - Is it worth paying more to delegate? Absolutely!
 - Unlike the Netherlands, no one is ever held accountable for their expected return forecast or manager selection not delivering the expected return – regulatory failure here too

- If Infrastructure becomes part of public fund liability – can accept lower returns
 - Hedging value may argue for lower premia – others may see it as a risky asset
 - But, then this should argue that all SAA investments will similarly underperform

- Is there a way to quantify the value of infrequent marking-to-market?
 - Have casual validation from consultants that this is what they do
 - But, then this should argue that all private investments will similarly underperform

- Short data window
 - Absence of skill or noise? How many years of data are adequate?
 - Not all decisions are good – need to be right just 53% of the time...(so is this the 47%?)

- Is this the entry cost of getting into a new asset class?
 - Hire the “safest” manager – not the best return
 - Email I got from a CIO of a public fund: “Strongly believe in keeping life simple” “being conservative and holding cash” “and not taking wild swings” “plus much harder to explain” “and internal dynamics”

THANK YOU

Dr. Arun Muralidhar - Biography

❑ Pension Investments:

- Founder, M^{cube} and AEGIS – companies that help asset owners manage beta for alpha and risk management
- Graham-Dodd, Dietz & Ed Baker (twice) awards; many clients won innovation awards for programs we designed
- Added significant value to client portfolios from beta management, especially in 2008
- Managed World Bank Pension Fund; Managing Director at JP Morgan Investments and FX Concepts
- Started career issuing bonds/swaps for The World Bank
- Co-author with Prof. Robert Merton (Nobel Prize Winner) of the “*SeLFIES bonds*”

❑ Author of Books on Effective Management of Portfolios:

- *Innovations in Pension Fund Management (Stanford University Press) - 2001*
- *SMART Approach to Portfolio Management (Royal Fern Publishing) - 2011*

❑ Social Security Reform:

- Co-author, with late Prof. Franco Modigliani, Nobel Prize Winner: *Rethinking Pension Reform (Cambridge University Press) - 2004*
 - ✓ *Offers a unique solution for the Social Security crisis – developed Guaranteed Return approach*
- Consultant to Govt. of Azerbaijan, proposed the Modigliani-Muralidhar reform model

❑ DC Plan Reforms (Uncovered Worker Plans):

- *50 States of Grey: An Innovative Solution to the DC Retirement Crisis (Investments and Wealth Institute) - 2018*
- Advisor to Overture Financial (Consultant to CA Secure Choice Investment Board)
- Formerly, Advisory Member, Council of Scholars - Georgetown Center for Retirement Initiatives
- Co-author with Prof. Robert Merton (Nobel Prize Winner) of the “*Flex MMM Model*” for uncovered workers

❑ Academic:

- Adjunct Prof. of Finance, George Washington University School of Business