# *SeLFIES:*

## A Globally-Applicable Bond Innovation to Improve Retirement Security, Infrastructure Funding, and Government Borrowing Cost

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The simulation assumes that we adjust the allocations to each asset on a daily basis after the close and at the closing price on that day, whereas the live product may not adjust the allocations exactly at that time or at that price and may have execution lags that affect the execution prices.

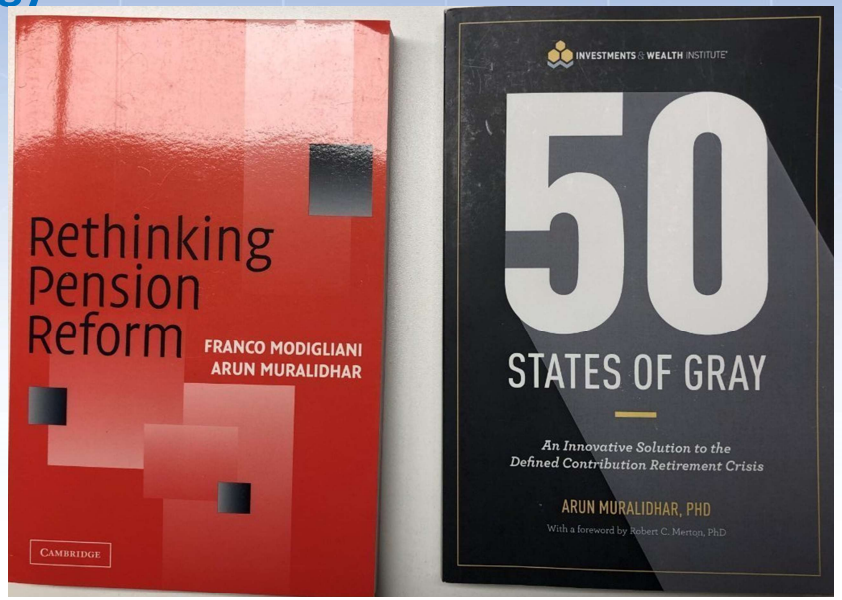
The simulation assumes certain transaction costs with respect to trades made, whereas the live portfolio might incur different transaction costs.

The simulation assumes implementation of the allocation shifts by buying and selling the underlying indices, whereas live portfolios may use other instruments (i.e. futures, forwards, active or passive managers) with a different return or cost.

Hypothetical or simulated performance results have certain inherent limitations. Unlike an actual performance record, simulated results do not represent actual trading. Also, since the trades have not actually been executed, the results may have under or over compensated for the impact, if any, of certain market factors, such as lack of liquidity. Simulated trading programs in general are also subject to the fact that they are designed with the benefit of hindsight. No representation is being made that any account will or is likely to achieve profits or losses similar to those shown.

# My Background: All Sides of the Fence

## Issued Bonds, Managed Pension Assets, Worked on Pension Reform, Founded an Asset Manager+Technology Firm




*World Bank*: Issued Bonds (early 1990s); Manager, Pension & Investments Depts (late 1990s); Retiree…

*JP Morgan/FX Concepts*: MD, Head, FX Research (1999-2007)

*M$^{cube}$/AEGIS*: Manage Institutional Assets (2001 – Current)

*GWU:* Adjunct Professor of Finance

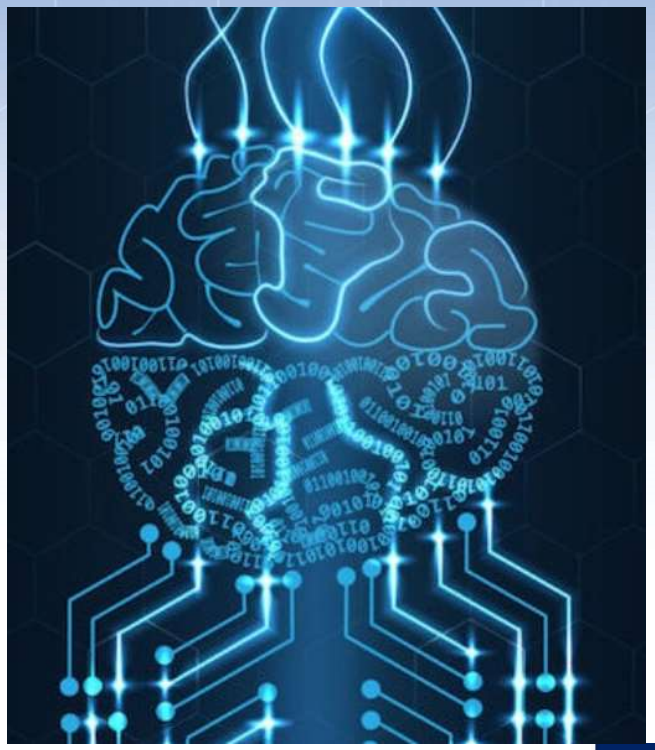
Author: ***Innovations in Pension Fund Management* (2001)**

***Rethinking Pension Reform, w*ith late Prof. F. Modigliani, Nobel Laureate *(2004)***

***SMART Approach to Portfolio Management (2011)***

***Fifty States of Gray: An Innovative Solution to the Defined Contribution Crisis (2018)***

# Agenda: Addressing Two Major Challenges with a Simple Innovation



- Retirement security is a major challenge globally
- Most adults are financially illiterate
- Funding infrastructure is also a challenge
- Innovation can address these challenges
- Implications for public finance/market development

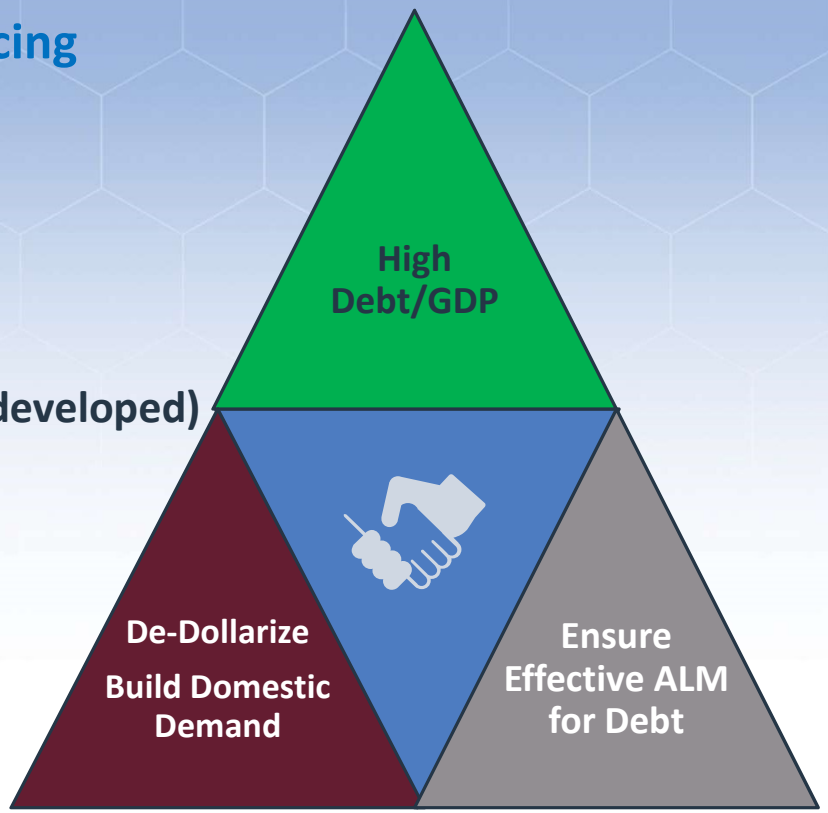
**Requires governments and development banks to be creative**

*Source: Muralidhar, A, K. Ohashi and S. Shin. 2016. The Most Basic Missing Instrument in Financial Markets: The Case for Forward-Starting Bonds. *Journal of Investment Consulting* 16, no. 2: 34–47.

# Public Finance Challenges

## How to Ensure Sustainable Debt Financing

- Countries running deficits (plus high Debt/GDP)
- EM would like to de-dollarize debt (capital markets not developed)
- Foreign investors = Hot money, esp. with rising rates
- Good Debt Management = Effective ALM




**MoFs/Treasuries Realize Twin Challenges of Infrastructure and Retirement Security**

U.S. Treasury. 2017. Treasury Calls for More In-Plan Lifetime Retirement Income Products (October 27). https://www. planadviser.com/treasury-calls-for-more-in-plan-lifetime-retirement-income-products/.

https://static.treasury.gov.au/uploads/sites/1/2018/05/c2018-t285219-position-paper-1.pdf

# Global Pension Plans: Multiple Challenges

**Going to Lead to a Global Retirement Crisis**

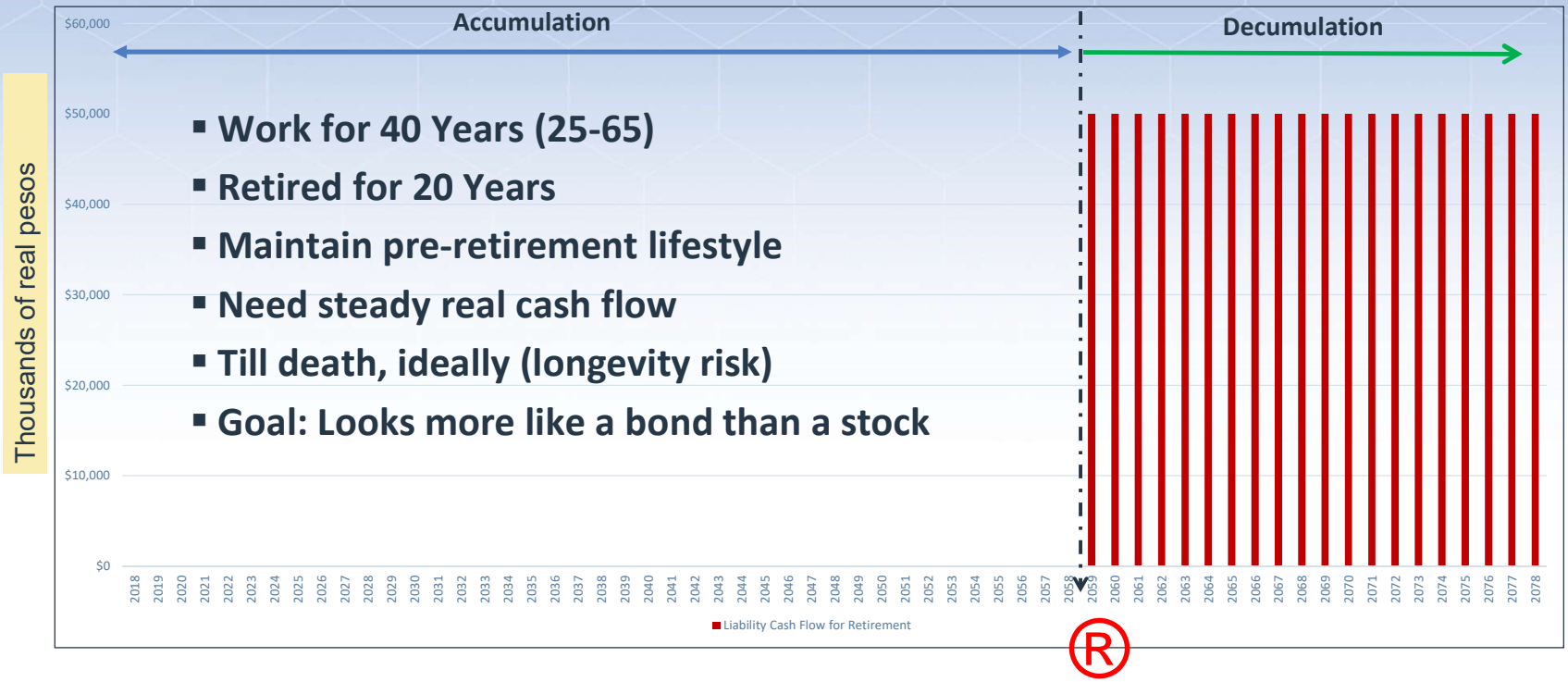
- ☒**Risk** transferred to individuals (one lifetime)
- ☒**Three big/complex decisions to make:**
  - ☒How much to save?
  - ☒Invest: What to buy? How much? Rebalancing?
  - ☒How best to decumulate? What annuity to buy?
- ☒**Big time-gap** between savings and retirement
- ☒**Financial illiteracy** of most participants
- ☒Have to deal with multiple parties = **High cost**



***Results in High Cost, Complex, Risky, Illiquid Options ("Annuity Puzzle")***

# Retirement Goal: Guaranteed, Real, Target Retirement Income Till Death

***Retirement Income Stream*: Need Steady Real Cash Flow**



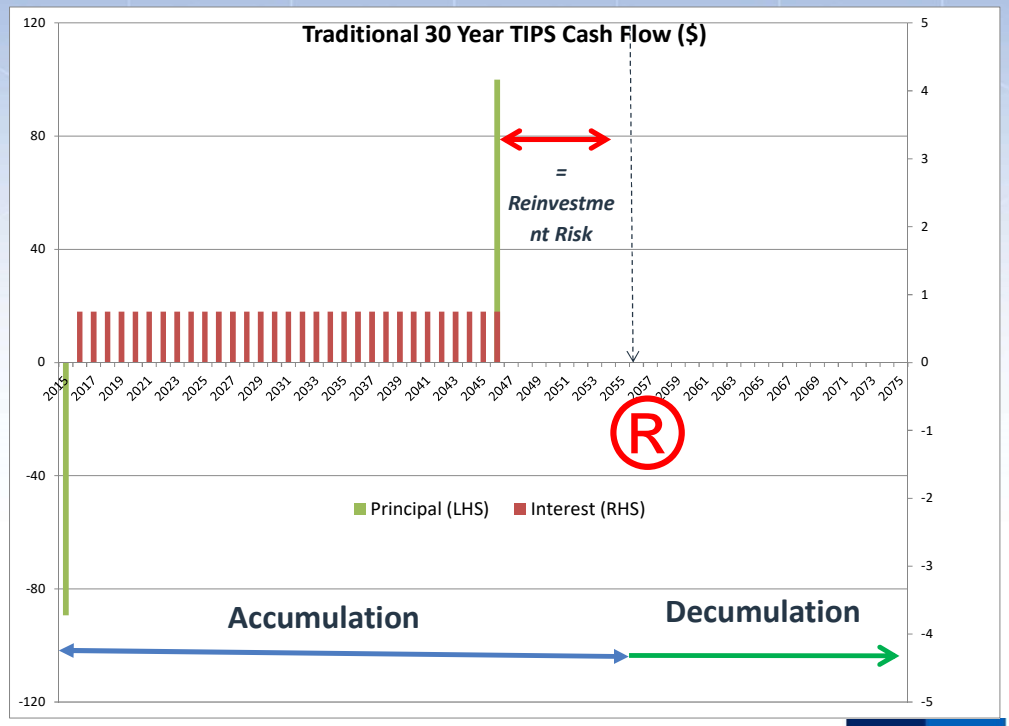

- Work for 40 Years (25-65)
- Retired for 20 Years
- Maintain pre-retirement lifestyle
- Need steady real cash flow
- Till death, ideally (longevity risk)
- Goal: Looks more like a bond than a stock

***Problem*: No Asset Has This Profile/Bridges The Time Gap; Annuities Not Popular**

# The Challenge: Bad Instruments

## Even Inflation-Linked Bonds are Risky in Retirement Plans

- **Cash Flow Mismatches/Reinvestment Risk**
- **Max US TIPs maturity = 30 years**
- **Slightly longer in countries like South Africa**
- **Inflation adjustment embedded in principal**
  - Can only hedge 10 years pre-retirement
  - Do not need coupons when working
  - Do not need Principal repayment
  - Financial engineering to create annuity profile = risky, costly, illiquid, complex

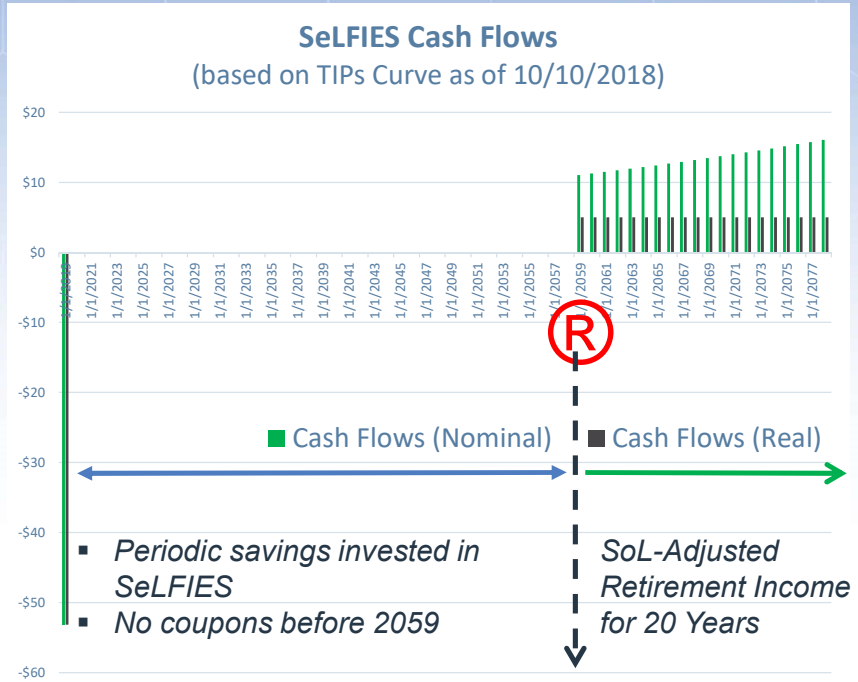



***More pertinent risk is Standard-of-Living risk***

# Solution: New Retirement Bond

## SeLFIES Idea with Nobel Laureate Robert Merton

- **Government/supras issue new bonds**
- **Key features of each bond:**
  - Starts paying at age 65
  - Pays coupons-only for 20 years (life expectancy)
  - Pays real $5/year
- **Goal = $50,000 per year/$5 per year = 10,000 bonds**
- **Establish demand for safe retirement asset**
- **Original idea with Professors from Japan, Korea: BFFS - Bonds for Financial Security**
- **Merton version: SeLFIES - Standard-of-Living indexed Forward-starting Income-only Securities**




Source: Muralidhar, A, K. Ohashi and S. Shin. 2016. The Most Basic Missing Instrument in Financial Markets: The Case for Forward-Starting Bonds. *Journal of Investment Consulting* 16, no. 2: 34–47.
Merton, R.C. and A. Muralidhar. 2016. Time for Retirement SeLIFES. *Investments and Pensions Europe*, June 2016
Muralidhar, A. 2019. Can (Financial) Ignorance Be Bliss? *Financial Analysts Journal,* Volume 75, 2019 - No. 1.

# Different from Traditional SCDI

## SCDI = State Contingent Debt Instrument

- SCDI try to protect sovereigns in a bad state
  - **SeLFIES issued regularly, offers hedges**
- SCDI = Linkers/Floaters/Extendibles
  - **SeLFIES a more intelligent form of linkers**
  - **LIVE bonds (extendibles) hedge longevity risk**
- SCDI requires a novelty/liquidity premium
  - **SeLFIES has natural demand ("safe asset")**
- SCDI = niche investors (and not clear why bundled)
  - **SeLFIES = retail and institutional investors**
  - **Clear reason for bundling bond with SoL**
- SCDI = adverse selection, moral hazard
  - **SeLFIES less likely to suffer these issues**

経済教室

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老後保障向け金融商品

退職後支払いの新型国債を

ポイント
- 老後保障確保に応える金融商品ほぼなし
- 退職時から一定期間均等額を払う仕組み
- 長期インフラ投資の資金手当てにも適合

2007年に東大客員教授を務めていた筆者の一人（ムラリダール）は日本の社会保障制度を分析した。公的年金制度は人口高齢化から深刻な圧力を受けているが、社会の連帯という概念を支える柱になっていると高く評価した。

公的年金制度は退職者に一定の年金収入を保障するが、各人の希望にかなう収入を確保するといった柔軟性は限られる。そこで個人的に銀行預金をするとか、保険会社と契約し年金商品を買うなどの策を講じて、退職後この人は金融知識が乏しいにもかかわらず、複雑な資産運用の判断を迫られている。

日本も退職後の保障を改善できるような新しい金融商品を導入する必要がある。今日では多くの国が人口構成の変化（平均寿命の延びや出生率の低下）と低成長により、同様の課題に直面している。社会保障制度を支えるための増税の余地は限られている。

もう一人の筆者（マートン）は、日本政府が年金基金や保険会社のALM（資産・負債管理）を改善する目的で40年物国債を発行した際に関わった。今回提唱するイノベーション（革新）は米国、フランス、インドでも提案したものだ。従来の保険を補強・強化するとともに、個人が退職後に備えるための低コストでわかりやすく直接的な手段を提供できるだろう。

米国でのゴールベース投資の新しい方向性にゴールベース投資がある。個人がめざすゴール（目標）は多様で退職から出発し、そのために必要な投資戦略も異なるはずだと考える。図は現在25歳の人が65歳から25年間にわたり、実質ベースで年収300万円（月25万円）を確保したいと希望する場合の退職年金のキャッシュフローを示したものだ。退職前の生活水準を退職後も維持するため、これだけの保証をするためにゴールとするとしよう。このフローのパターンは、家の購入や旅行など他のゴールのためのパターンとは全く異なる。

社会保障制度から実質ベースで年200万円、月約17万円の年金が給付されるとすると、実質ベースで年100万円を自分で手当てする必要がある。このゴールの達成にとって固有要因となるのが金融知識の欠如だ。いくら貯金すればよいのか、どの資産に投資すればよいのか、どんなペースで取り崩すのがよいのかなどの判断を迫られる。

大人でも複雑。インフレの影響、分散投資のメリットなどに関する質問に答えられる人はほとんどいない。そのような民間の保険会社が提供する退職年金を除いて、図のような特殊なターンに応えられる資産は存在しない。しかもこうした金融商品は仕組みが複雑で流動性が低く、濃厚な給付の柔軟性に乏しいうえ、人件費は高コストだ。

一方、銀行預金は資産を守ってくれるが、利回りが低いため退職者には不向きだ。

発行済みの日本国債は利子のみを年年に1度支払い、元本は満期時に償還される方式をとる。仮に額面5万円の40・歳で置き換所得保険国債（SeLFIES／JGBs）一円の元本は最後の利払いとともに40年後に償還される。

一方、個人向け小口額面1万円）の10年物国債は変動金利型しか発行されない。この国債は資産保護の観点からは安全な金融商品にみえるかもしれない。だがその支払いは図のような望ましいキャッシュフローのパターンとはかなり異なる。また個人は主に働いていて収入のあるうちから、後もないのに利子を受け取ることになる。

このため将来の不確実な利率で再投資せざるを得ない。元本は一度償還されるので、キャッシュフローのミスマッチと再投資リスクを招く。たとえ元本がインフレ率に応じて調整される物価連動国債であっても、それだけでは不十分だ。退職よりかなり前に貯金を投資に回していたため生活水準が大きく変動しているはずだ。退職後も生活水準を維持するようとすれば、必要な金額は退職までの長い間に増えていく可能性が高い。生活水準を維持するには備えが足りない。

日本政府がより期間の長い50年物国債を発行することは可能だろう。しかしそれでも、低コストで流動性が高く超長期の新型債券を発行する方が、そのために筆者が提案するのが、生活水準連動年物日本国債を買えば、半年に1度の利払いがあり、5万



個人の資産運用負担 軽減

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年生れ。ノーベル経済学賞受賞 97 44

Arun S. Muralidhar
年生れ。M・T博士。専門は年金運用 66

Muralidhar, Arun, Managing Longevity Risk – The Case for Longevity-Indexed Variable Expiration (LIVE) Bonds (October 10, 2018). Available at SSRN: https://ssrn.com/abstract=3224236 or http://dx.doi.org/10.2139/ssrn.3224236

# Demand for BFFS/SeLFIES: Retail, Institutional

## Broad Group of Investors, Regular Purchases

- ✓ **Individuals**
  - ✓ uncovered by any public/private pension plan, ensures retirement through personal saving
  - ✓ covered by pension plan but low benefits, must accumulate additional assets through personal saving
  - ✓ covered by pension plan but part of the plan requires personal decision-making in which to invest the plan asset
- ✓ **Pension Funds and Insurance Companies** (pension, annuity benefit liabilities) want effective, low-cost hedge
- ✓ **Institutional and Retail Investors** who would want efficient, low-cost core "best-diversified" portfolio

**'Selfies' de jubilación para mayor cobertura**

Se trata de un modelo sencillo que no requiere de intermediarios.

Will Selfies stick?

Pension bonds are an ingenious idea for providing retirement income

*But everyone still needs to save more*


*Source: The Economist, May 2018*

*Source: Prof. Merton Presentation at World Knowledge Forum in Seoul, Sept 2018. See also, Muralidhar, A. 2019. Can (Financial) Ignorance Be Bliss?* Financial Analysts Journal, Q1 2019 Forthcoming

# BFFS/SeLFIES: Good for Governments+Supras

## Unique Cash Flow Profile Synergistic with Infrastructure Investing

- ✓**Reduces risk of retirement poverty/bailouts**
- ✓**Helps finance infrastructure projects**
  - ✓Key goal of many governments
  - ✓Cash flows from bond = Infrastructure needs
- ✓**VAT regime = government is hedged**
- ✓**Boosts national demand for debt; sustained demand**
- ✓**Provides near-term budget relief (DANGER)**
- ✓**Insurance companies – lower annuity costs**
- ✓**Could be transformational in typically under-developed emerging markets** (I issued the first Greek drachma bond by a development bank)

N ECSTASY OF IDEAS

THE TIMES OF INDIA, MUMBAI
MONDAY, FEBRUARY 5, 2018

# SeLFIES For India

*These long-term bonds can fund India's infrastructure needs and improve retirement security*

Robert C Merton and Arun S Muralidhar

The Indian government unveiled its Budget and recognises that the infrastructure sector needs investments of Rs 50 lakh crore to boost GDP (allocating Rs 5.9 lakh crore as a primary step). Simultaneously, certain provisions in the Budget seek to improve the lives of retirees, and finance minister Arun Jaitley specifically noted that, "A life with dignity is a right of every individual, in general, more so for the senior citizens."

One of the major challenges that India will face is ensuring the income security of its senior citizens, especially in a country where financial literacy is relatively low. The government can easily fund infrastructure, especially since it has given permission to the National Highways Authority of India (NHAI) and other institutions to issue bonds, and have an immediate impact on the retirement challenge by issuing a new type of long-term bond, one we call SeLFIES – Standard of Living indexed, Forward-starting, Income-only Securities.

SeLFIES address many of the challenges raised in the Budget and are also advantageous to the ministry of finance, especially in light of the recent implementation of a Goods and Services Tax (GST).

"A life with dignity" would ideally include guaranteed, real income, from retirement through death, and the ability to lead a lifestyle comparable to pre-retirement. The Indian government

and decumulation because they are largely financial illiterate.

The complexity of retirement planning leaves many confused about what constitutes adequate savings for retirement. Individuals are overwhelmed by the information provided and the absence of a robust and uniform method to make these calculations. Moreover, there is uncertainty over what to invest in and how best to decumulate. Most adults can barely answer questions about compound interest, the effects of inflation or the benefit of diversification. Investing in existing assets is risky relative to the retirement objective, because these assets fail to provide a simple or low-cost cash-flow

**SeLFIES are designed to pay people when they need it and how they need it. Even the most financially illiterate individual can be self-reliant with respect to retirement planning**

annuity markets are not sufficiently deep or developed. More importantly, many hesitate to buy annuities because they can be complex, opaque and illiquid; investors fear not being able to bequeath

the risk of inflation and standard-of-living improvements.

SeLFIES are designed to pay people when they need it and how they need it, and greatly simplify retirement investing. A 55-year-old today would buy the 2024 bond, which would start paying coupons when he turns 65, in 2025, and keep paying for 20 years, through 2044.

In this way, even the most financially illiterate individual can be self-reliant with respect to retirement planning. For example, if someone wants to guarantee Rs 50,000 annually, risk-free for 20 years in retirement to maintain their current standard of living, they would need to buy 500 SeLFIES – ie, Rs 50,000 divided by Rs 100 – over their working life.

The 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. SeLFIES do not address all issues, including longevity risk, but go a long way toward improving retirement security.

These securities are a good deal for governments, too. In fact, governments are the biggest beneficiaries. SeLFIES not only improve retirement outcomes for all citizens saving for retirement, but also have spill-over benefits.

First, cash flows from SeLFIES reflect synergistic cash flows for infrastructure spending: namely, large cash flows upfront for capital expenditure, followed by delayed, inflation-indexed revenues, once projects are online. Financing infrastructure has been a challenge and a priority for the current government, especially given the current Budget. Second, SeLFIES gives the Indian government a natural hedge of revenues against the bonds, through GST.

The looming retirement crisis needs

# Summary: SeLFIES Achieve Multiple Goals

- **Current DC trend necessitates need to innovate**
  - ✓ **SeLFIES = Forward-starting IO-only Real Bond**
  - ✓ Lowers cost, risk, complexity, and illiquidity
- **Good for Governments/Development Banks**
  - ✓ Funds infrastructure; new investor segment
- **Good for Individuals**
  - ✓ Secures and simplifies retirement planning
- **Applies to Developed and Developing Countries**
  - ✓ Proposed for USA, France, Japan, Turkey, Portugal, India, Korea, Chile, Colombia….


SeLFIES a good look for Australian retirement

By Robert C. Merton and Arun S. Muralidhar | 06/06/2018

The Treasury Department has issued a report seeking comment on ways to improve retirement income security in Australia (*Retirement Income Covenant Position Paper: Stage*

# Thank You!