



2º SEMINÁRIO INTERNACIONAL DE PREVIDÊNCIA COMPLEMENTAR

O papel da Previdência Complementar em meio
ao cenário atual de mudanças

SeLFIES: A New Bond to Address Retirement Security

Dr. Arun Muralidhar

November 22, 2019

APOIO:



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REALIZAÇÃO:

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Background on Speaker: Worked on Both Sides of Pensions Pension Reform, Asset Management, and Academic



The World Bank

: Issued Bonds (early 1990s); Manager, Head of Research Pension & Investments Dept (late 1990s)

JP Morgan

and



: MD, Head, FX Research (1999-'07)

M³



: Co-Founder; Manage Institutional Assets; Developed Unique Strategy (2002- Today)

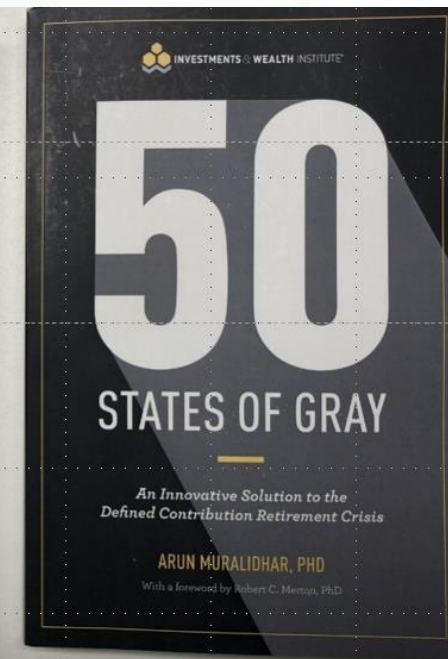
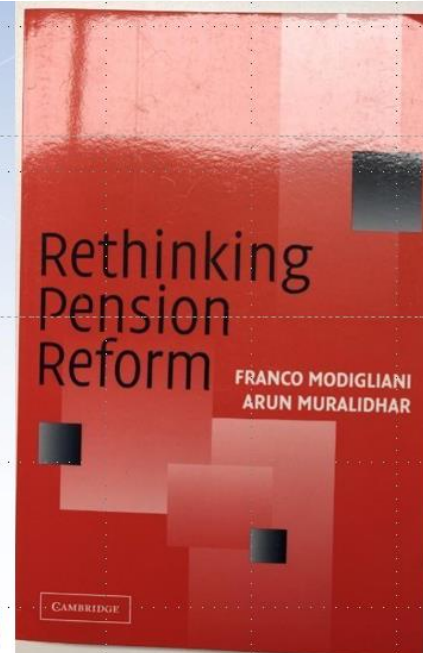


: *Innovations in Pension Fund Management (2001)*

Rethinking Pension Reform, with Prof. F. Modigliani (2004)

SMART Approach to Portfolio Management (2011)

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



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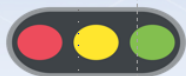


Agenda: Addressing Two Major Challenges with a Simple Innovation

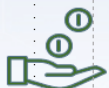
Retirement Security and Funding Infrastructure



Retirement security is a major challenge globally



Most adults are financially illiterate



DC plans focused on wrong goal and instruments



SeLFIES - A New Bond for Retirement Security.
Innovation can address these challenges and fund infrastructure



DC Plan Design: Modigliani, Merton, Muralidhar (MMM)

➔ **Requires Governments and Development Banks to be Creative**



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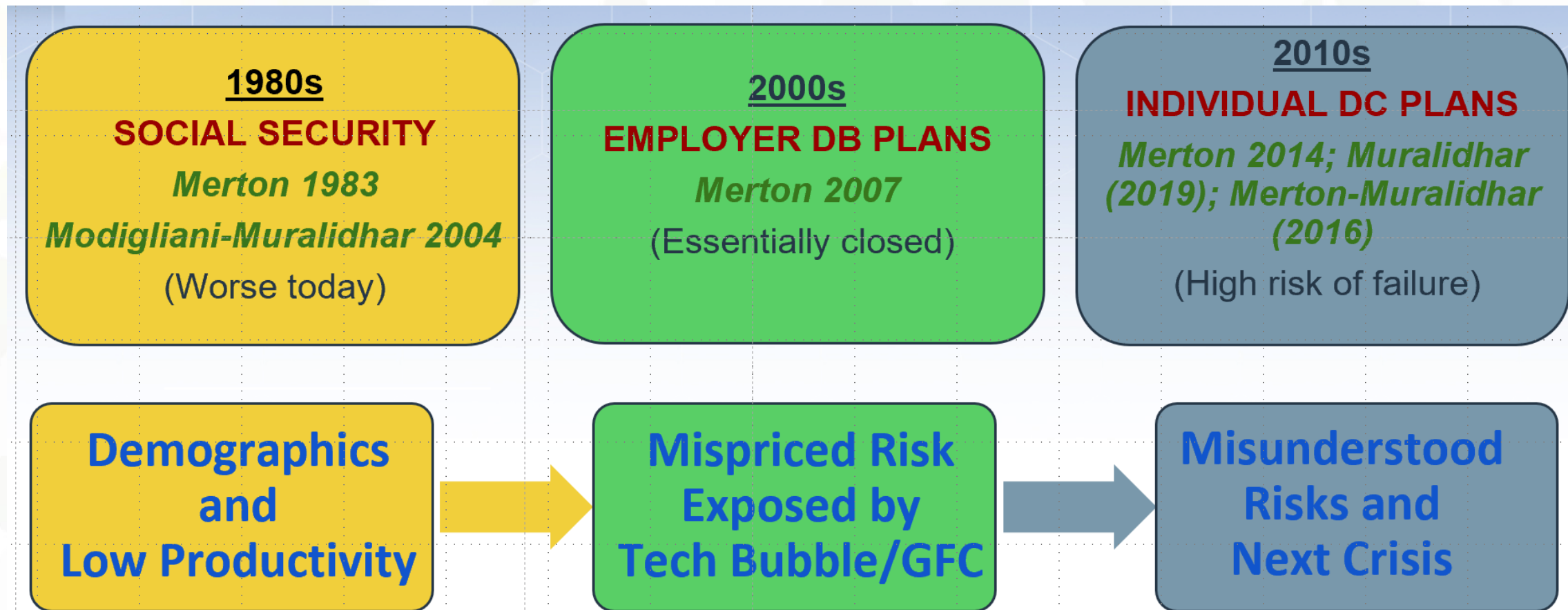
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Evolution of Retirement Crisis – Both in DB and DC

Ticking Time Bomb - Financial Illiteracy, Low Productivity and Increasing Longevity



Merton, R.C. 2007. "The Future of Retirement Planning." In *The Future of Life-Cycle Saving & Investing*, Z. Bodie, D. McLeavey, and L.B. Siegel (eds.). Research Foundation of the CFA Institute, 2007, Charlottesville, VA.
Modigliani, F. and A. Muralidhar. 2004. *Rethinking Pension Reform*, Cambridge University Press



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Defined Contribution Plans: Many Challenges

Goal Unchanged: Guaranteed Real Retirement Income

- ⊗ **Risk transferred to Individuals (one lifetime)**
- ⊗ **Three Complex Decisions:**
 - ⊗ How much to save?
 - ⊗ How to Invest: What to buy? How much? Rebalancing?
 - ⊗ How best to decumulate? What annuity to buy?
- ⊗ **Financial Illiteracy** of most participants
- ⊗ Must deal with multiple parties = **High Cost**



What is the Goal for Retirement? Goal is Same Whether DB or DC

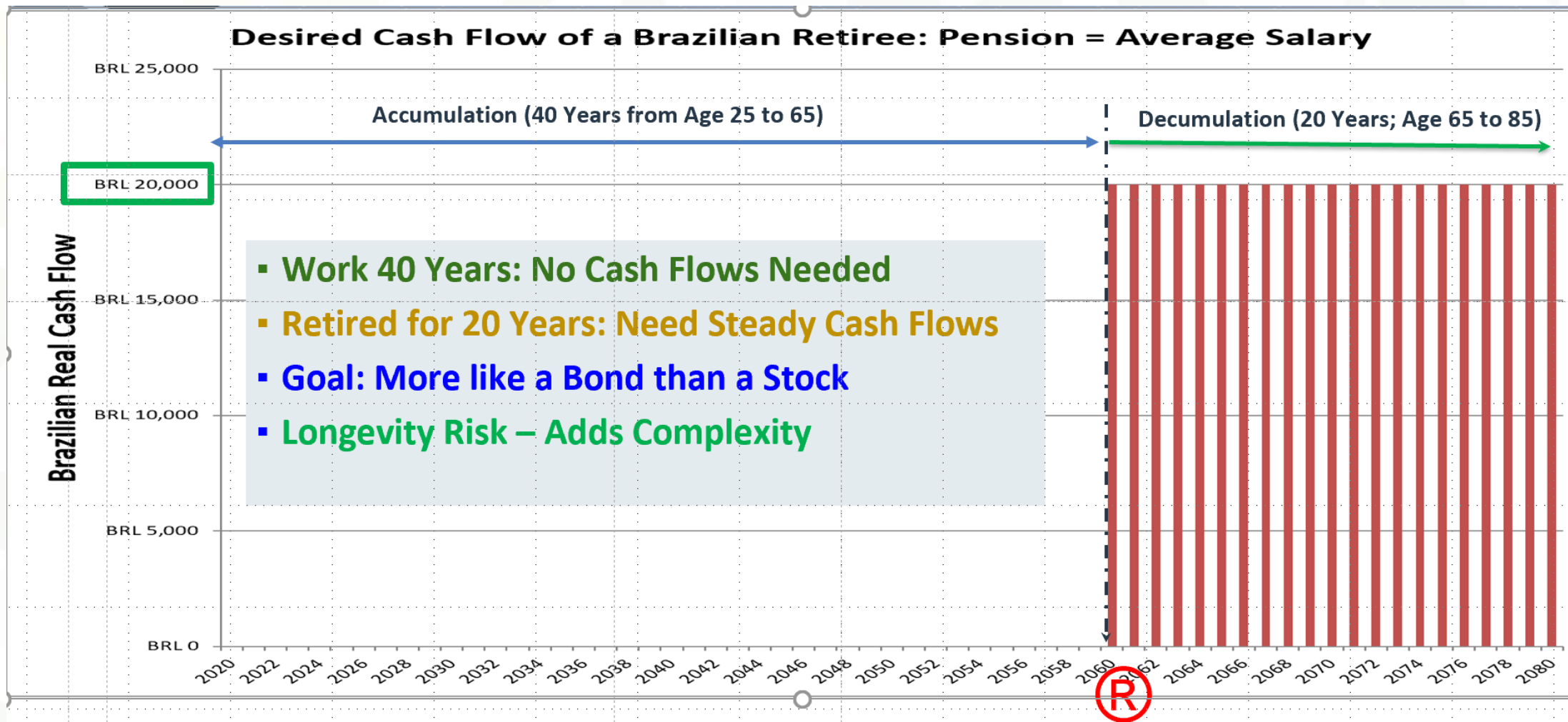
Nobel Laureate Prof. Robert C. Merton:

“An inflation-protected income for life that allows you to sustain the standard of living you enjoyed in the latter part of your working life.”

Standard-of-living is measured by income, and not by wealth. Standard-of-living risk is measured by income risk and not wealth risk



Goal Restated: A Steady Income From Retirement Till Death Guaranteed and Real = Preserve Pre-Retirement Lifestyle



Problem: No Asset has this Profile/Bridges Time Gap; Annuities Not Popular



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Biggest Challenge: Financially Unsophisticated Investors Unable to Understand Compounding/Impact of Inflation

❖ They are Competent to Express their Goals

- ❖ Desired Retirement Income and Date of Retirement
- ❖ Savings Rate and Level of Risk

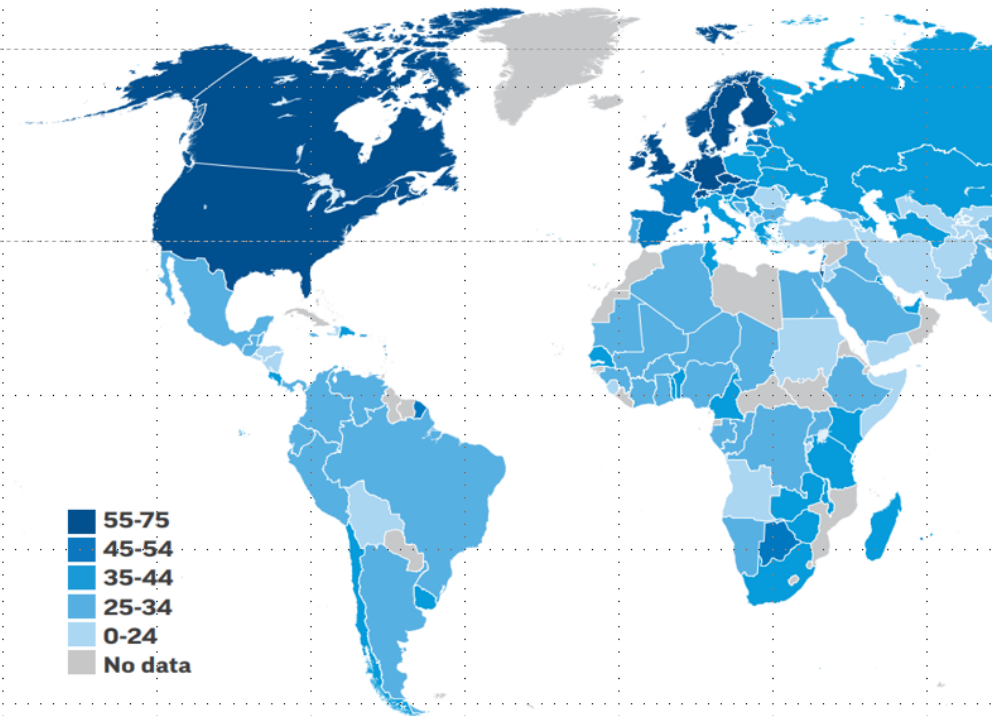
❖ Existing Products Not Understood by Individuals

❖ TDFs/Life Cycle Funds are Not Good Products!

- ❖ Do not guarantee either Wealth or Income at Retirement

❖ Key Point: Goal is Retirement Income (not Wealth)

MAP 1: GLOBAL VARIATIONS IN FINANCIAL LITERACY
(% OF ADULTS WHO ARE FINANCIALLY LITERATE)



Source: S&P Global FinLit Survey

➔ **Will Need Strong Regulation To Ensure Consumer Protection**



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Industry Challenge: Wrong Safe Asset

Industry Focused on Wrong Goal; Life Cycle Funds = Guarantees Nothing!

T-Bills, even regular bonds, considered “safe”

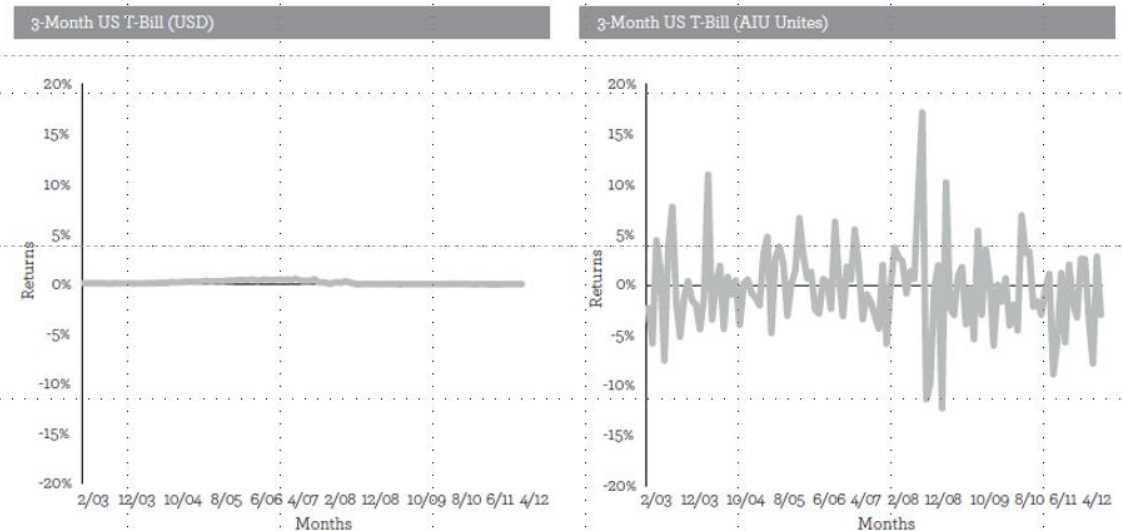
Protect principal (wealth)

Highly Volatile: Annuity/income perspective

Current products (Life-cycle Funds) very risky

In SS Privatization craze (1990s-2000s), govts increased bond allocation to protect principal

FIGURE 6-5: MEASURING RISK OF T-BILLS FROM AN ABSOLUTE AND RELATIVE VOLATILITY PERSPECTIVE



The volatility of T-bills is minimum risk when looking at it as an asset value.

Based on T-bill data provided by Bloomberg.

Source: Merton (2014)

The volatility of T-bills is high risk when measured in terms of AIU.

Must be Smarter About the “Safe” Asset or “Default” Product



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The Challenge Continued: All Assets are Risky!

Even Inflation-Linked Bonds are Risky in Retirement Plans Because of Cash Flow Mismatch

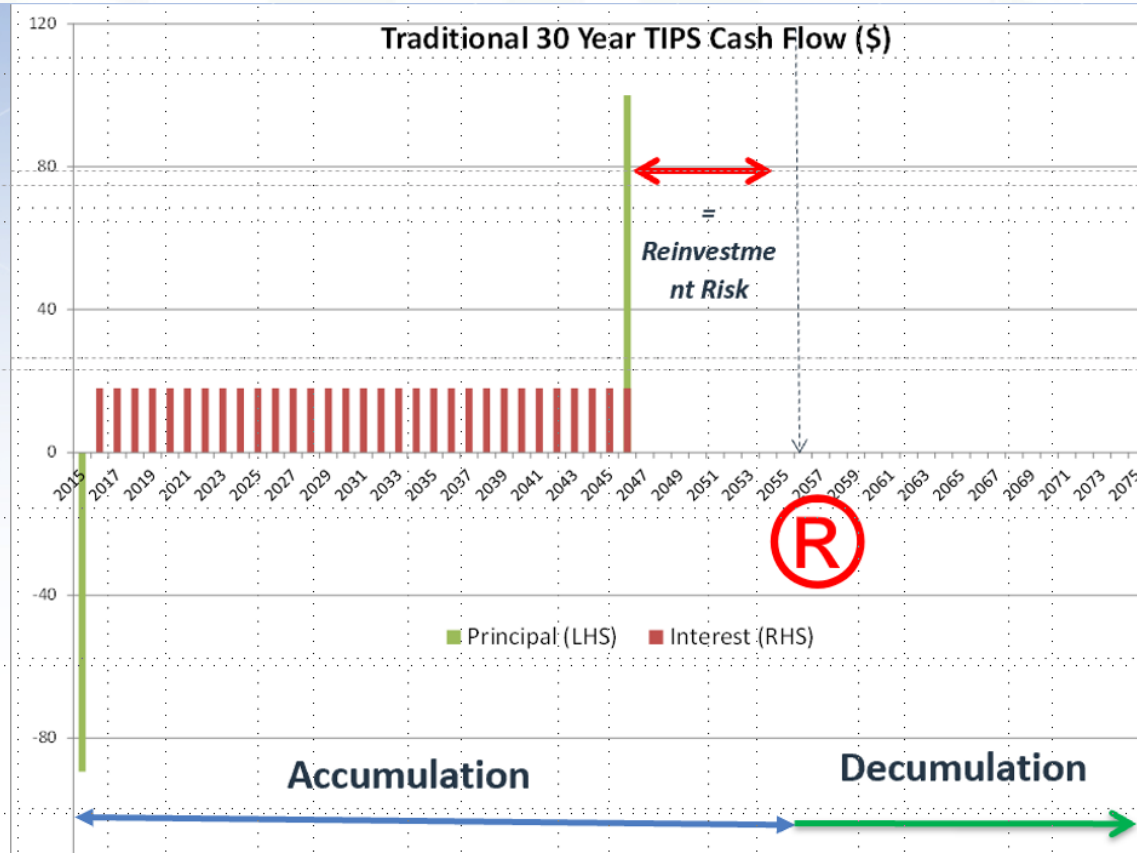


Cash Flow Mismatch/Reinvestment Risk



Brazil maturity = 30 years maximum
(S. Africa is longer)

- ❖ Can only hedge 10 years pre-retirement
- ❖ Do not need coupons when working
- ❖ Do not need Principal repayment



Brazil Was a Pioneer in Inflation-Linked Bonds

More Pertinent Risk in Retirement is Standard-of-Living Risk



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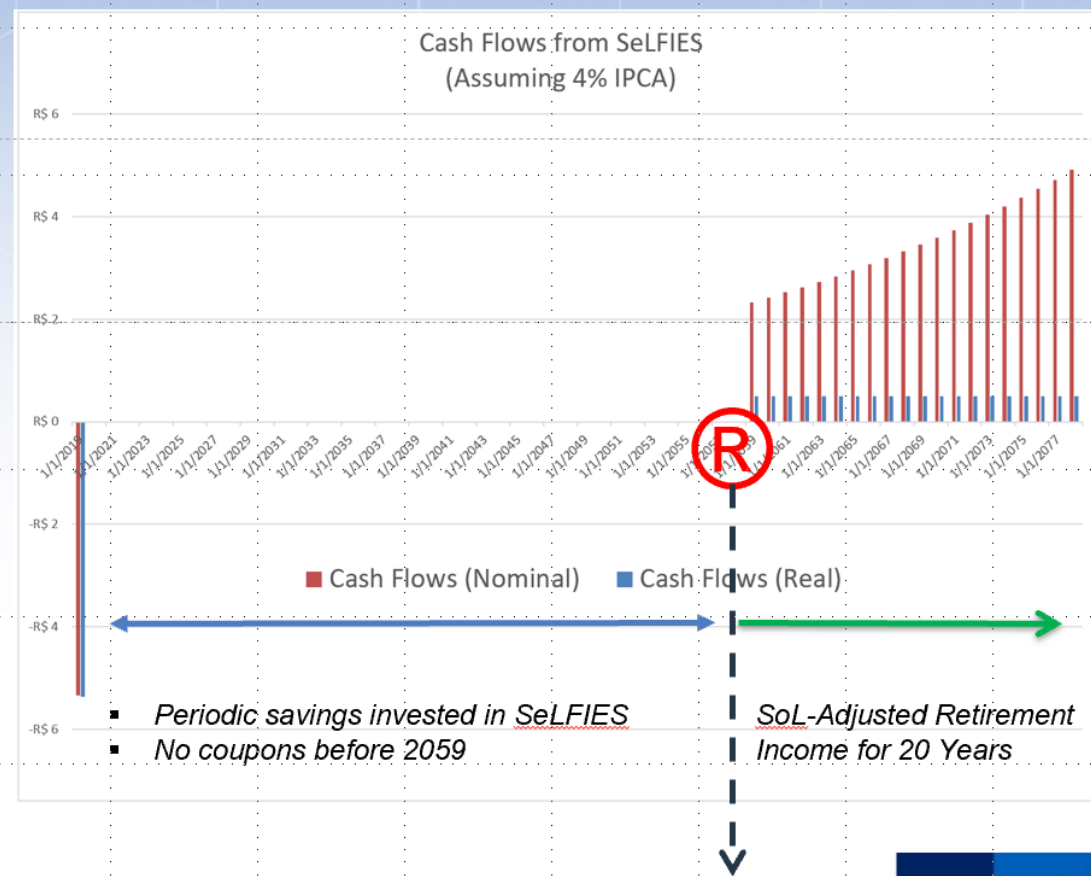
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Solution: SeLFIES – A New Retirement Bond (with Nobel Laureate Prof. Merton)

Redefine Cash Flows to Suit Needs of Retirement Investors

- **SeLFIES - Standard-of-Living indexed, Forward-starting, Income-only Securities**
- **Government Issues New Bond**
- **Key Features:**
 - Payment begins at age 65 (Retirement Date)
 - Coupons-only for 250 months (Life Expectancy) = 20+ yrs
 - BRL R 0,04/month (0.48 real/year)
- **Goal: BRL 1.600/month @ BRL 0,04 real/month = 40.000 bonds**
 - Easy to track: 30.000 bonds = 75% of Goal
 - **Total Payments received = BRL 400.000**
- Pension Bond: **Creates “Individual DB”**



Price Determined by Market; Version 1 – Linked to IPCA



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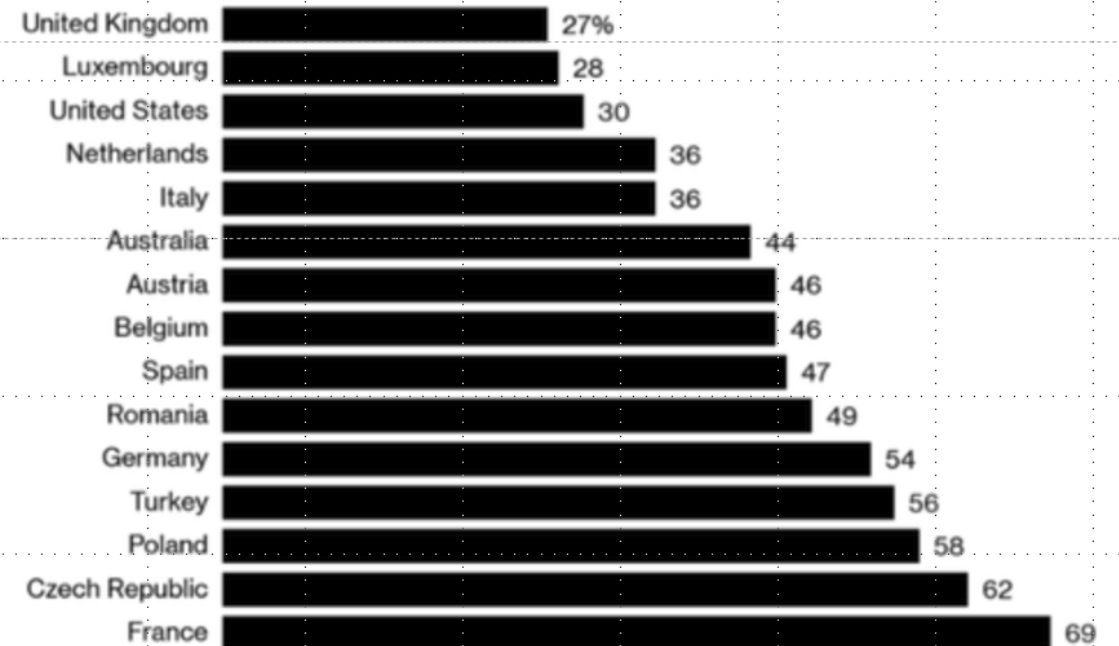
SeLFIES Innovation: A Few Simple Changes

From Generic Bonds to Retirement Bonds = Demand & Supply

- **Bond Cash Flows = Retirement Goal**
 - No bullet repayment, only steady Cash Flow
- **Payment based on real amounts, not coupon (%)**
 - BRL 0.5 real/year (or R 0,04/month)
- **Indexed to Aggregate Per Capita Consumption**
 - Real Standard-of-Living Risk for Retirees
- **Forward-starting:** No cash flows when not needed
- **Designed for financially unsophisticated population**
 - Embeds Inflation, Compounding
- **If Well-Designed: Exchange 1 SeLFIE for 1 Annuity = Same Retirement Income!**

Reality Check

Share of current retirees who say they do not "enjoy the same standard of living I had when working."



ING International Survey

Bloomberg

Can Be Issued in Small (Retail) and Large (Institutional) Denominations



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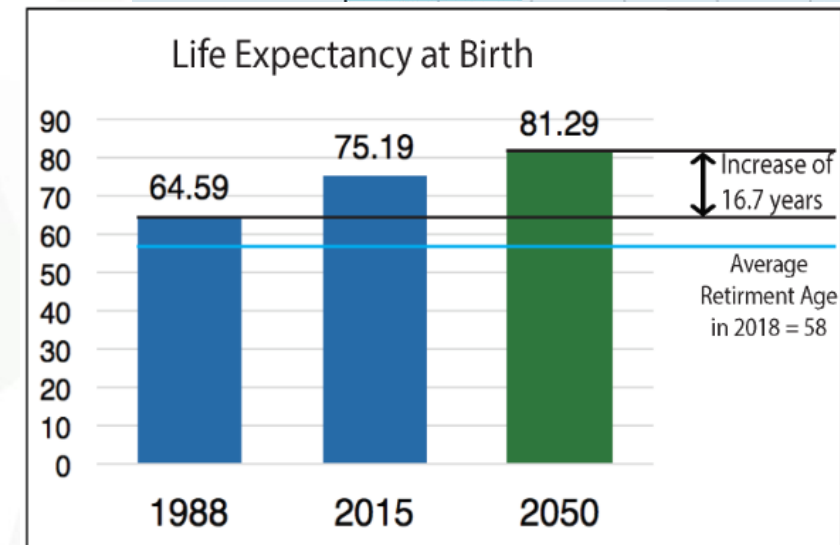
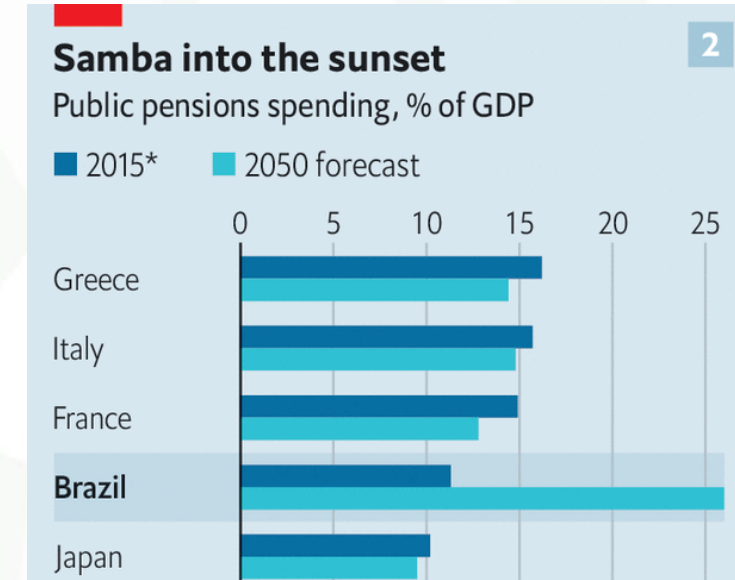


SeLFIES For Brazil: Can Be Easily Created

Using Finance Science to Address Retirement Crisis

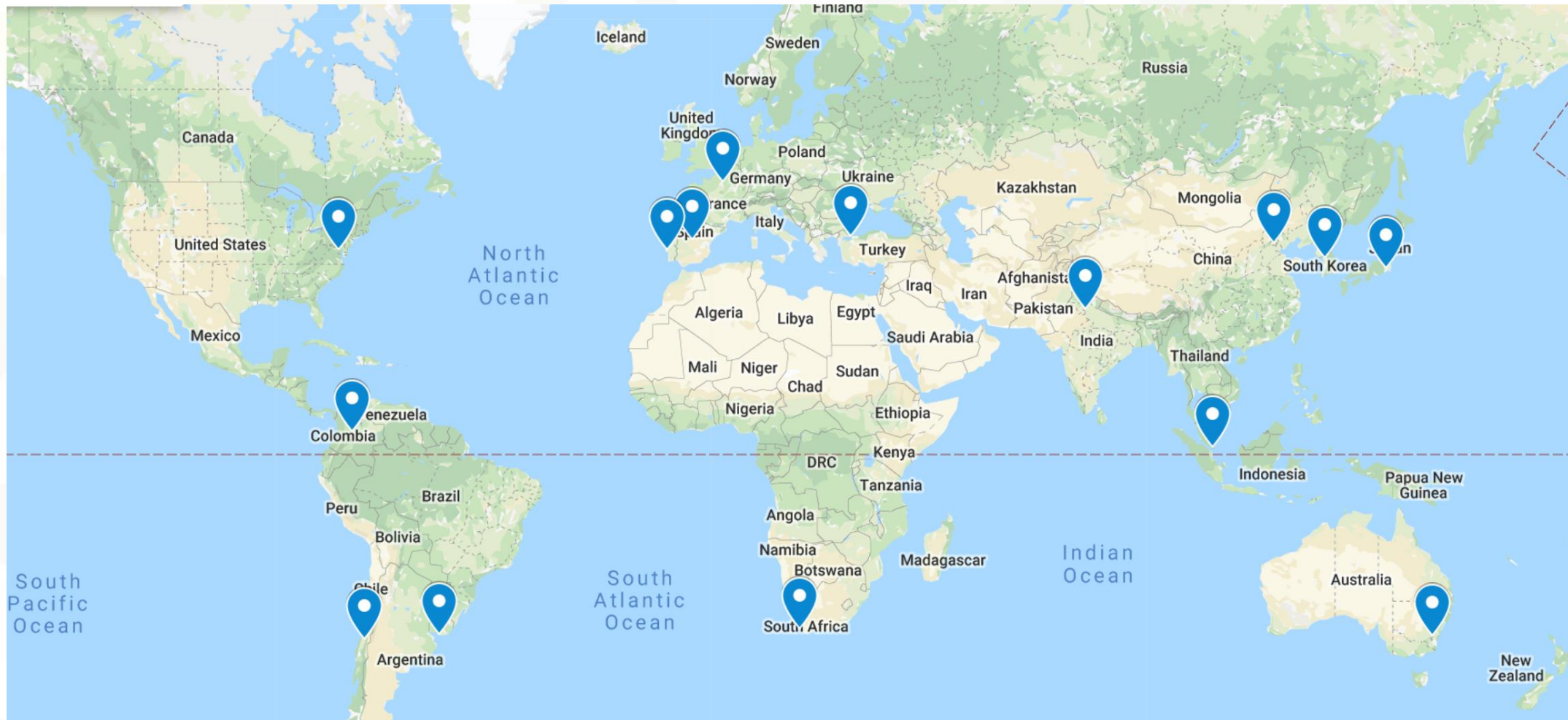
- **Is in the Middle of Pension Reform**
Current system is not-sustainable
Can innovate for a much better system than peers
- **Brazil is a Pioneer in Issuing Inflation Linked Bonds**
Issued first ILB in 1964; Currently \$260bn outstanding
Can Issue Small + Large Denominations
- **Has a Value-Added Tax**
Hedges government; provides Standard-of-living index basis
- **SeLFIES Can Improve Longevity-Risk Hedging as Well**

- ✓ **Brazil Already Has Tesouro Direto – Selling Bonds to Individuals**
- ✓ **First Version Could Be Just Linked to IPCA**
- ✓ **Coupon (Size/Frequency) Set by What is Best for Low Income Savers**



Applies Globally: Same Simple Design

Each Country Can Customize to Their Own Specific Situation: Uruguay



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Demand for SeLFIES: Retail and Institutional Broad Group of Investors, Regular Purchases

✓ Individuals

Not covered 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 to invest the Plan Asset

✓ **Pension Funds and Insurance Companies** (pension, annuity benefit liabilities) want Effective, Low-cost Hedge

✓ **Institutional and Retail Investors** 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

Gaity Images



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SeLFIES: Beneficial For Governments (and Multilateral Development Banks)

Unique Cash Flow Profile Synergistic with Infrastructure Investing

- ✓ Reduces Risk of Retirement Poverty/Bailouts
 - ✓ Helps Finance Infrastructure Projects & SDGs
 - Key goal of many governments
 - Cash flows from bond = Infrastructure needs
 - ✓ VAT Regime = Government Hedged
 - ✓ Boosts National Debt Demand; Sustained Demand
 - ✓ Provides Near-Term Budget Relief (DANGER)
 - ✓ Insurance Companies – Lower Annuity Costs
 - ✓ Could be Transformational in Emerging Markets
- (issued first Greek drachma bond by a development bank)

NECSTASY 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 Marathekar



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

and documentation 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

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 2036, and keep paying for 30 years, through 2046.

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 50 SeLFIES - 1e, 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

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



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PÁTRIA AMADA
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SeLFIES Can Help with Management of Longevity Risk (An “A-New-ity”) Well-Designed Instrument Could Address Annuity Puzzle

✓ Goal of Individuals: Sustainable Retirement Income

Buy SeLFIES but Have Longevity Risk (Living too Long)

✓ Goal of Insurance Companies: Profit/Manage Risk

Diversify Longevity Risk by signing large number of people

✓ Well-Designed SeLFIES

For right Maturity of Payments, Insurance Company would be willing to exchange 1 SeLFIES for Life Annuity paying \$5 real/year till Death

As long as Insurance Company achieves Average Longevity of Economy, this trade makes sense. Good for individual too

Price of SeLFIES vs Price of Annuity informs about Design of Product and Longevity Diversification of Insurance Companies

老後保障向け金融商品

退職後支払いの新型国債を

個人資産運用負担軽減

現在25歳の人が希望する退職年金のキャッシュフローのイメージ(年取ベース)

25年間(2018年25歳) 65歳(65歳) 83歳(83歳) 90歳(90歳)

300万円

0

2018年(25歳)

65歳(65歳)

83歳(83歳)

90歳(90歳)

25年間にわたり、社会保障制度と個人の手当てで保障を確保したい

65歳までは支払い不要

米国での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な認識から出発し、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55歳の人が65歳から25年間(2018年25歳)にわたって、毎月10万円を積み立てるイメージ。25年間で2500万円を積み立てるイメージ。そのうち1000万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阻害要因となるのが金

影響、分散投資のメリットなどに伴う疑問に答えられる人はほとんどいない。そのうえ民間の保険会社が提供する年金型期間付年金を除いて、図のような特殊なパターンに当てはま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、遺族給付の柔軟性に乏しいうえ、大抵は高コストだ。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向かない。発行済みの日本国債は利子のみ半年に一度支払い、元本は満期時に償還される方式をとる。仮に額面50万円の40年物日本国債を買えば、半年に一度の支払いがあり、5万

に貯金を投資め生活水準が低ければ対応。退職後も生活費までを維持するに可能性は低い。このように、日本国債も、低コストで長期の新しい方がよい。構築するが、換え型SeLFIES

安否年金を懸念しない。チャートのような図のようなら、異なる、キリがない。聞いていて取り必要もなければ、このためです。元本を一度、キーンと手と再投資し、元本が戻ると調整される。

Robert C. Merton
年生まれ、MIT博士
年ノーベル経済学賞
97 44

Ann S. Marshall
年生まれ、MIT博士
門は年金運用
66

マサチューセッツ
工科大学教授
ジョージ・ワシントン
大学特任教授

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The Flex MMM Plan: A New Pension Plan Design Creates a DC Plan that Addresses SUPER ACCESSIBLE Goals

✓ Merton's Model of Retirement Income

Correct Goal in Retirement + Method to Achieve

✓ Modigliani's Idea of Borrowing from Retirement Plans

Liquidity is Key; Improves Overall Balance Sheet

✓ Muralidhar's Idea of a New Bond

Creates New Liquid "Risk-free" Asset

✓ Each Country or State Can Design their own Version

Simple - participants, Universal, Portable, Easy for governments, Returns high, Adequate, Choice, Certainty, Easy for employers, Smoothing, Simple report, Insulated from political risk, Be inclusive, Low cost, and Easy to regulate



Each Country Can Customize to Their Unique Needs



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Summary: SeLFIES Achieves Many Goals

Greater the Delay in Creating SeLFIES; Higher the Cost

❖ Current DC Trend Necessitates Innovation

- ✓ **SeLFIES = Simple Pension Bond; “Individual DB”**
- ✓ Lowers cost, risk, complexity, and illiquidity

❖ Good for Governments/Development Banks

- ✓ **Lowers bailout likelihood; funds infrastructure; creates new investor segment**

❖ Good for Individuals with Little/No Financial Literacy

- ✓ **Secures and simplifies retirement planning**

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](#))



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