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Investi Nel Tuo Futuro e Nel Futuro del'Italia

By

By Dr. Arun S. Muralidhar, Fabio Galli, and Giorgio Fano

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Abstract

A commonly-accepted retirement goal for a healthy pension is for it to sustain the relatively higher standard-of-living of the latter part of one's working life throughout retirement. A recent innovation implemented by Brazil in January 2023 might provide a solution to the pension challenges faced by Italy, and more importantly, satisfy the key goals identified by Italy's Department of Treasury in its 2023 Public Bond Guidelines. We recommend Italy create and issue an innovative new bond – Tesoro Obbligazioni per le Pensioni (TOP or BTTPI), known previously as SeLFIES. The TOP/BTTPI bond is a single, simple, liquid, low-cost, relatively low-risk (government-issued) instrument, easy-to-understand for even the most financially unsophisticated individual, because it matches the desired real retirement income profile of individuals and embeds accumulation, decumulation, compounding and inflation-adjustments.

Keywords: Retirement Bonds, SeLFIES, TOP, Tesoro Obbligazioni per le Pensioni, Financial Literacy, Second Pillar Pensions, Previdenza Complementare, Financial Innovation, Increasing Coverage, Buono Tesoro Poliennale Pensione Inflazione (BTPPI)

JEL Classification: G50, G51, G52, G53

Introduction – The Global Retirement Challenge

The traditional three pillars of retirement security - state-provided Pay-as-You Go (PAYG) Social Security (SS), employer-provided defined benefits (DBs) or defined contributions (DCs), and private DC savings – are teetering on the brink of collapse for a number of similar reasons. Very simply, these systems have been either chronically underfunded or impacted by sub-optimal investment decisions (i.e., mismatched assets to liabilities or use of incorrect financial instruments as the "safe" asset). Individuals will probably experience one or more of the following bad options: (a) retire relatively poor; (b) have to postpone retirement; and (c) work part-time in retirement (to generate income). The protests in France over the raising of the retirement age to 64 demonstrate how unappealing postponing retirement is to individuals, though other countries, including Italy have been able to raise the retirement age. Regardless, without some major improvements in retirement systems, it is highly likely that many individuals globally will still have to be bailed out by governments or will have to deal with major real value reductions to their pensions. This additional burden to governments and pensioners would come at an inopportune time as debt-to-GDP levels are high and many economies are experiencing slow to moderate growth. Countries as diverse as the US, Brazil, France, Chile, India, Italy, and the Netherlands have already implemented major pension reforms to address in order to change that trajectory.

The causes of this looming crisis are multi-faceted (Muralidhar 2018a). In this paper, we will focus our attention solely on improving the environment for investing in DC plans, specifically Italy's 2nd Pillar, because governments and employers want to limit risk exposure DB plans and would prefer to move new entrants to DC plans. The PAYG SS DB and employer DB systems are typically underfunded – i.e., the accumulation, if any, is insufficient for the retirement promises made. In the case of SS, these DB schemes were (largely) funded through the PAYG mechanism, whereby the young are taxed to pay off the old. As Modigliani and Muralidhar (2004) demonstrated, this method of funding SS puts the scheme in jeopardy as PAYG contributions have a high degree of sensitivity to changes in demographics or productivity. These factors have negatively impacted SS systems globally and will continue to do so for the foreseeable future. Given the widespread interest in the role of a public pension system, Merton (1983) proposed the creation of an innovative, mandatory, fully-funded, public DC system, but different from

traditional models considered at that time (and probably since). Modigliani and Muralidhar (2004) recommend converting PAYG systems to partially funded systems (and retaining the DB), and intelligent investment of assets (i.e., tied to benefits promised and what is feasible in markets).[1] Both recommendations were ignored and some countries like Chile privatized SS, moving individuals into a traditional DC scheme. As the first generation of participants approach retirement, many of these countries are realizing that current DC schemes do not provide adequate and/or secure retirement income leading to social unrest just as Modigliani and Muralidhar (2004) had warned, and in many cases the previous reform is being rolled back (e.g., Chile).

Employer-based DB plans have also suffered badly, especially with the bursting of the dotcom technology bubble in 2000-2, and the Great Financial Crisis (GFC) in 2008. The average funded status – or assets divided by liabilities at market prices –of these plans, in most countries fell below 100 percent, and some countries considered reductions in pensions, leading to protests (Cumbo and Wigglesworth 2019). Pension funds are unlikely to achieve full funding anytime soon because the sponsors cannot contribute to their pensions (because of the tough economic environment), and expectations of future asset returns are weak. In some part, the funding difficulties in DB plans was caused by insufficient contributions, poor investment approaches that did not try to match assets to liabilities (e.g., the improper application of Modern Portfolio Theory or MPT as noted in Muralidhar 2019b, or mispricing of risk as noted in Merton 2007), and our inability to correctly forecast future returns. At least with DB plans, there is an inter- and intra-generational sharing of risks, along with a backstop through a sponsor, so asset-liability mismatches and low funded status do not affect the current retiree generation entirely. But it does affect future generations and the sponsor who may have to bear an undue burden.

Increasingly, companies and government entities are no longer providing DB plans and are transferring the entire retirement risk, or at least a significant part of it, to the individual via DC plans (or to private savings, which have the same risk profile as a DC plan). There are many issues with transferring retirement planning decisions to individuals (Muralidhar 2018a) beyond the fact that they are largely financially unsophisticated (Klapper et al 2015). First, many are not saving enough, i.e., they are grossly underestimating how much they need for retirement.[2] Second, there

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[1] See also Modigliani and Ceprini (1998).

[2] http://blogs.wsj.com/economics/2015/10/26/baby-boomers-hugely-underestimate-what-they-need-for-retirement/

is insufficient coverage of individuals – i.e., people either not being offered a plan, especially informal or day laborers, or being offered one and not participating. Third, and the biggest issue, even for the sophisticated investor let alone the unsophisticated participants, is that many are investing their assets poorly to achieve their goals. Additionally, planning for retirement requires forecasting inflation to preserve one's standard-of-living and this is beyond the capabilities of even sophisticated individuals. These challenges are caused by both the shortcomings in the theory behind investing for retirement, and the lack of basic financial knowledge.

Visco (2008) rightly states that a commonly-accepted retirement goal for a healthy pension is for it to sustain the relatively higher standard-of-living of the latter part of one's working life throughout retirement (and that they do not outlive their assets). Individuals are being made to take greater responsibility for their own retirement and take haircuts in post-retirement standard of living, as employer DB and government pension plans are either capped at levels well below a good retirement or completely replaced by DC plans. Visco (2008) further raises a challenge as, "The current crisis has only highlighted the urgent need for better functioning markets and better retirement products, if future retirees are to be guaranteed adequate living standards… The phases of accumulation and decumulation are closely intertwined: the optimal design of the former strongly depends on the latter and vice-versa."

A recent innovation implemented by Brazil in January 2023 might provide a solution to the pension challenges highlighted by Visco (2008) that apply to Italy. More importantly the bond innovation satisfies the key goals identified by Italy's Department of Treasury in its 2023 Public Bond Guidelines. Very briefly, Brazil's RendA+ (or "Retirement Extra") bond, issued through their Treasury Direct facility (and through a digital, is a very effective instrument that might serve as a model for the Italy to adopt/adapt (Muralidhar and Vitorino 2023). This bond was designed along the lines of the "SeLFIES" or "Standard-of-Living-indexed, Forward-starting, Income-only Securities", first proposed by in Muralidhar (2015), Muralidhar, Ohashi and Shin (2016) and Muralidhar and Merton (2016). It is designed specifically to address the challenges of this new responsibility faced by working and middle-class individuals worldwide, the majority of whom are totally unprepared to do so, and do not have access to good quality financial advice.

The paper is structured as follows: Section I examines the current challenges in DC Retirement plans and highlights how current "safe" instruments or "products" are risky from a DC retirement

perspective, thereby guaranteeing a future crisis unless changes are made immediately. Section II describes specific challenges faced in Italy's 2nd Pillar systems and the goals of the Italian Treasury for 2023 and beyond. Section III describes Tesoro Obbligazioni per le Pensioni (TOP) or BTPPI (Buono Tesoro Poliennale Pensione Inflazione), highlighting key features of the proposed new instrument for Italian government officials to consider and finalize. Section IV provides a case study of Brazil and focuses specifically on a few design features that are critical to the successful issuance and trading of these instruments. Section V demonstrates how TOP/BTTPIs can improve longevity risk hedging and demonstrates how TOP/BTTPIs are attractive for Italian Treasury. Section VI discusses the value of TOP/BTTPIs in serving as a "currency for retirement". Section VII concludes.

I. The DC Retirement Challenge

The complexity of retirement planning leaves many confused about what constitutes adequate savings. Available information is overwhelming and there is no robust, uniform method to calculate "replacement rates" (i.e., percent of salary replaced in retirement). Current DC reports inform investors about accumulated wealth (and historical returns of various instruments), but provides no information about the likely guaranteed retirement income that the accumulated wealth would achieve. The recent passing of the SECURE 2.0 Act in the USA[3] will require reporting of potential retirement income, but the law does not specify a uniform method to do so, leading to a high degree of variability in how firms will report to individuals. Further, the Department of Labor (DoL) in the United States provides safe harbor guidance about appropriate investments (i.e., freedom from lawsuits for the employer if certain products are offered), but investing in existing assets is risky relative to the retirement objective, because these assets do not provide a simple, low-cost cash flow hedge against desired retirement income as shown later. Similarly, in Italy, 2nd pillar Italian savers invest in Capital Guaranteed instruments, which do not provide any retirement income guarantee. Even a portfolio of traditional, "safe" government securities, unless heavily financially engineered (at some cost), is risky because of the cash flow

[3] https://www.investopedia.com/secure-2-0-definition-5225115

(and potential maturity) mismatch between traditional bonds and desired retirement income stream. Finally, annuities could provide desired retirement cash flow, but most investors in the world do not buy annuities because they can be complex, illiquid and opaque, and investors fear they cannot bequeath these assets to their heirs if they buy annuities. In this section, we examine these issues in more detail to make the case for a new instrument that addresses the challenges posed by current T-Bills, Treasury Inflation Protected securities (TIPs), Target Date Funds (TDFs), or annuities/guaranteed return products.

The Retirement Income Goal: What is the desired retirement income stream or cash flow of an individual? Assume a 25-year-old in 2023. They would typically plan to work for 40 years and would like to receive say €60,000 real/year for 20 years in retirement (assuming death is known; an assumption we relax later) or €5,000 real/month. They would like this real stream to be indexed to an appropriate nominal adjustment to allow them to retain their pre-retirement standard of living. Figure 1 plots the likely real retirement cash flow of this 25-year-old. Figure 1 shows that the goal requires no cash flows for 40 years (through 2063) and then a steady stream of real income for 20 years. This is very different from a single wealth number that individuals are asked to think about as their "retirement number" or even a guaranteed return. This is a critical point as the traditional approach to the retirement challenge has been entirely wealth focused or return focused in Italy; however, what Figure 1 demonstrates very clearly is that retirement is all about guaranteeing that individuals receive a target, steady level of real retirement income. This simple change in goal has enormous implications for what can be considered the safe asset. Merton (2007) had raised a cautionary flag about DC investment practice in the early 2000s that persists today – the excessive focus on wealth or size of assets (and rates of return on investments) in retirement accounts as opposed to the level of retirement income – the more appropriate measure of retirement welfare.

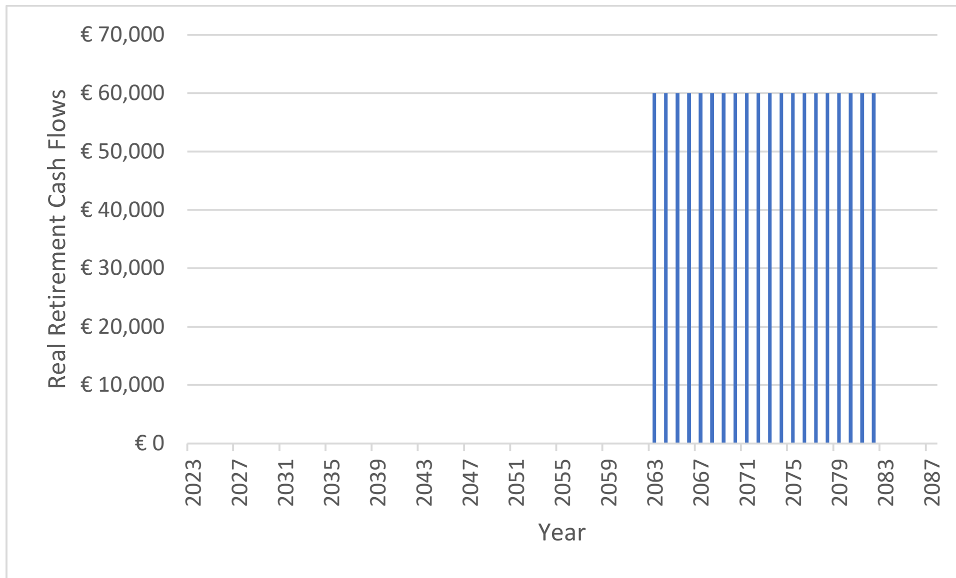

Figure 1: Projected Real Retirement Cash Flows of an Italian 25-year-old in 2023 – work 40 years; live for 20 years.

Challenges with T-Bills/ BOT. Merton (2007) warns that the “risk-free” asset in MPT and most DC plans is quite risky in terms of annuity income units (Merton 2010, 2012, 2013, 2014a, 2014b). Annuity Income Units (AIU) measures the level of steady income one can earn through an annuity at any given time based on prevailing interest rates. Merton (2014a) argues that the goal of retirement investors should not be to maximize wealth, but rather to maximize funded status (i.e., assets divided by liabilities), as this effectively puts the spotlight back on retirement income as the goal of investment decisions. The reason for raising this point was to show how assets regarded as safe in the traditional MPT context – T-Bills/BOT – are actually risky from a DC retirement context (or when measured from the perspective of AIU). While T-Bills/BOTs preserve principal (assuming they are default-free), they provide no guarantee of retirement income both because of the cash flow mismatch to Figure 1, but also because the focus (wealth preservation) is entirely different from what is needed in DC plans (steady retirement income). This is shown in the second panel in Figure 2 as the relative volatility of a T-bill/BOT (relative to desired cash flow in Figure 1 or AIU) is clearly non-trivial and non-zero or low. Hence, “safe” assets in current DC plans globally are risky from a retirement income perspective and this puts retirees at risk of poor retirement outcomes.

Measuring Risk: T-Bills Monthly Returns

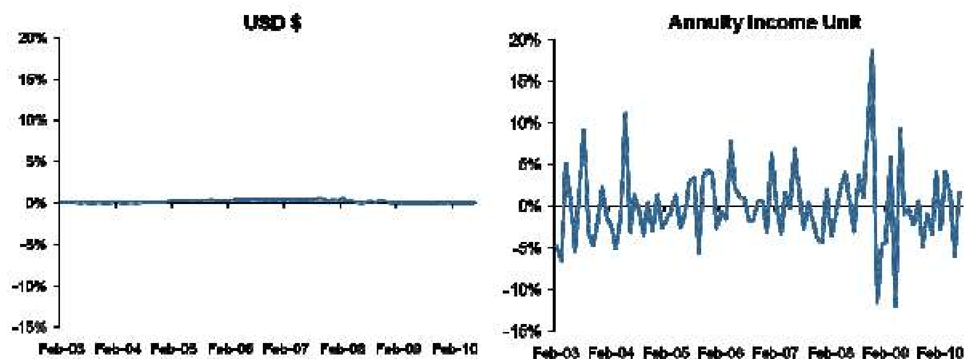

Figure 2: Measuring Risk of T-Bills (or BOT) from an Absolute and Annuity Income Unit Perspective (Source Merton: 2014)

Challenges with TIPs or Bond Indexed to European Inflation (BTP€Is or BTP Italia[4]*).* One might argue that T-Bills/BOTs are not the safe asset in retirement but rather that investors should invest in TIPs/ BTP€Is instead as they offer a longer maturity and protection against inflation, especially since BTP Italia is relatively short-term. However, this comment is easily disproved on two critical aspects – they engender a cash flow mismatch and they offer the wrong nominal protection. Consider a very simple 30-year TIPS/ BTP€Is bond that pays a €3 real coupon/year and repays the real €100 principal at maturity. The real cash flows of this bond are plotted in Figure 3. This bond: (a) pays coupons when the individual does not need it – i.e., the payments are received pre-retirement (the retirement date denoted by solid green line at 2063), thereby requiring additional transactions to transform these coupons into the cash flow stream required in Figure 1; (b) pays a stub principal in 2053 which is also not needed – the cash flow stream required is a steady stream

[4] **BTPi** (indexed Treasury bonds): floating rate securities whose principal and semi-annual coupons take into account rates of inflation in the euro area, as measured by the Harmonised Index of Consumer Prices (HICP) excluding tobacco; they are issued with 5-, 10- and 30-year maturities. Included in this category are **BTP Italia**, floating rate securities with 4-year maturities and semi-annual coupons indexed to Italian inflation (ISTAT's FOI index). Investors acquiring securities at issue and holding them to maturity also receive a loyalty bonus. https://www.bancaditalia.it/compiti/operazioni-mef/index.html?com.dotmarketing.htmlpage.language=1

in Figure 1, and 2053 is short of the retirement date (2063); and (c) is linked to consumer price inflation, whereas the true risk in retirement is standard-of-living risk. As ING (2019) notes, "About half of retirees in Europe tell us that they don't continue to enjoy the same standard of living they had when they were working." This issue of appropriate indexation of pensions to standard-of-living had been raised by Merton (1983), but has been largely ignored and continues to be a challenge globally.

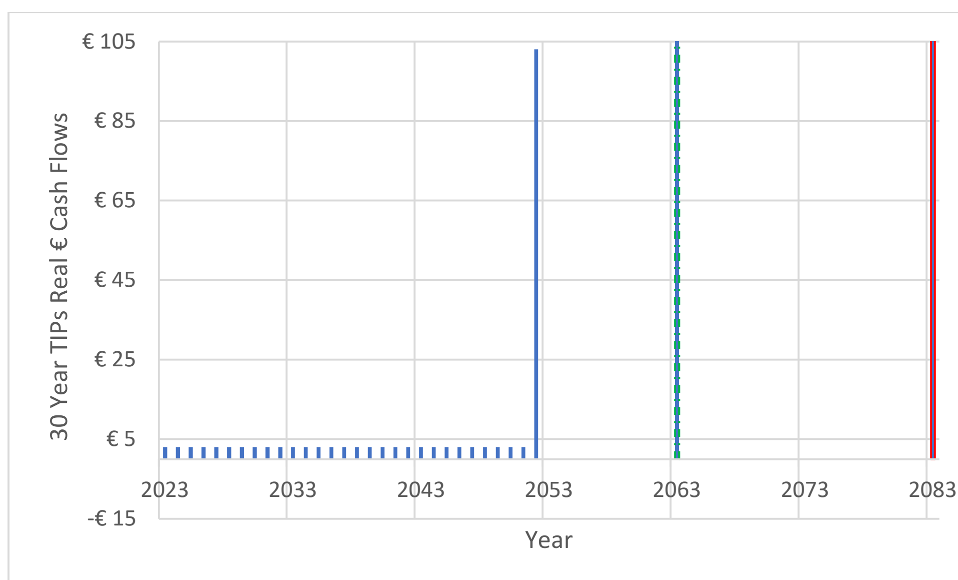

Figure 3: Cash Flows of 30 Year TIPs/ BTP€Is relative to retirement date (2063) and death (2083)

Very simply, converting the cash flows from the TIPS/ BTP€Is in Figure 3 to the desired cash flows in Figure 1 will require at least 61 additional, cost-inefficient transactions (2 per year for each semi-annual coupon, and one for the principal payment, and that too of very small size for the average individual). Hence, TIPS/ BTP€Is cannot be considered the safe asset for retirement.

The Challenges with TDFs. Moreover, Merton (2007) demonstrates that investment approaches adopted by many DC funds and retail investors, especially TDFs, are actually inefficient and risky

approaches from an individual retirement income perspective (see also Bodie et 2010).[5] Muralidhar (2011) had raised a similar cautionary flag. Very simply, these products rotate the asset allocation from stocks (risky from a DC retirement perspective) to bonds (also risky as shown in Figures 2 and 3), as one ages, with no focus on the retirement income target. As Kobor and Muralidhar (2018) demonstrate, a TDF provides a highly variable retirement income because the glide path is independent of the target retirement income (e.g., Figure 1), and the achievable target retirement income is continuously impacted by stock market performance and changes in interest rates, among other variables. Further, the glidepath is independent of the individual's personal situation (e.g., gender, current wealth, risk tolerance). As Merton (2014a) notes, investing an entire cohort (that was born in the same year) in the same TDF is like buying the average shoe size for a room of people – highly unlikely to be ideal for anyone. Moreover, two individuals with identical saving/investing characteristics, retiring a few years apart can achieve wildly different retirement incomes as shown in Kobor and Muralidhar (2018). As a result, even though DoL in USA provides safe harbor protection for TDFs, they are risky instruments. Providing safe harbor protection to these products raises the likelihood that governments will have to bail out participants who receive low to poor pensions from their DC plans.

The Challenges with Annuities. Muralidhar (2019c) summarizes the challenges with annuities, which continue despite the fact that thirty years ago Prof. Franco Modigliani noted (in his 1986 Nobel speech) that annuities are under-utilized (termed the "annuity puzzle"). Ostensibly, annuities could provide the cash flow required in Figure 1 and could be the "safe" asset, but this is useless if individuals do not purchase them. Salisbury and Nenkov (2016) note that, "In June 2015, U.S. retirement assets totaled $24.8 trillion, with only 8.6% of assets held as annuity reserves." Many explanations have been offered for this annuity puzzle including adverse selection (i.e., only those who know they will live long want to buy annuities), bequest motive[6], complexity/inflexibility of contracts[7], mortality salience[8], etc. Beshears et al. (2012), using survey data, note that even when the annuity option is the default in DB schemes, people opt for the lump-

[5] Target Date Funds are portfolios of stocks and bonds, where the allocation to bonds increase as the investor ages. They are normally referred to by a retirement date (e.g., 2050), and have a starting allocation to stocks and bonds and then a glide path, which adjusts this allocation based on the calendar year.

[6] Lockwood (2012).

[7] Mitchell et al (2000).

[8] Salisbury and Nenkov (2016).

sum option, because while they want life-time income, they want flexibility in their spending, and also worry about the credit risk of the plan sponsor.

The Challenges with Guaranteed Products: In Italy, 39,6% of 2nd pillar Italian savers invest in Capital Guaranteed instruments, which do not provide any retirement income guarantee. "COVIP[9] supervises the investments and sets forth the rules governing the initial and periodical information provided to members and transparency on investments.

The contributions, which are collected by pension funds, are invested in secure vehicles provided by law and are usually managed through:

- agreements with insurance companies;
- agreements with asset management companies;"[10]

But guaranteeing a return or the principal does not guarantee a real retirement income as in Figure 1 as they have the same risk as BOT/BTPPI discussed above.

In summary, existing instruments and products in Italy are risky, illiquid, costly, potentially complex and clearly insufficient, and include too many intermediaries to address the looming global retirement challenge, especially for a largely financially unsophisticated and uncovered population.

II. The Challenges Faced by Italy – Pensions and Debt Funding

Pension Challenges and Incentives

According to Mercer (2022), **"**Italy's retirement income system comprises a notional DC scheme for workers and a minimum means-tested social assistance benefit. Voluntary supplementary occupational schemes also exist; coverage is low but gradually increasing. The overall index value for the Italian system could be increased by expanding coverage of employees in occupational systems." 'The Second Pillar'/voluntary supplementary pensions are called '*Previdenza Complementare'*.

According to OECD (2021), "It consists of both open funds and closed collectively agreed funds. The closed funds can be funded by both employers and employees as well as from the voluntary

[9] Pension Fund Supervisory Board.
[10] https://www.lexology.com/library/detail.aspx?g=5ec45d25-869d-4f76-b68d-0310f5d6032c

transformation of TFR (accumulated end of working life severance pay). The open funds provide an annuity based on contributions. The current TFR contribution rate is 6.91% of gross salary. The invested funds are capitalized each year with the application of a fixed rate of 1.5% and a variable component, equal to 75% of the annual increase in the consumer-price index.

The number of workers enrolled in a private pension fund is still low." As of December 2021, only 25.4% of active workers had enrolled into a Previdenza Complementare scheme.[11] Additional details on the Occupational Schemes are provided in the Appendix. In order to automate the transition of TFR into Previdenza Complementare, legislation (252/2005) obligated certain funds to offer capital guaranteed schemes (CGS), which are risky from a retirement income perspective as noted in Section I. CGS distorts the market: as of Dec 2021 39.6% of total members choose CGS schemes with total assets worth €25.5 billion (12,4% of total second pillar savings).[12] These instruments are in fact insurance policy, normally managed by insurance companies and do not ensure secure retirement income. The component of the management fee covering the cost of the capital guarantee represent 50% to 75% of total, increasing total fees by a factor of 2x / 4x.

The popularity of CGS is driven by lack of information and the financial illiteracy of active workers, who typically do not focus on their retirement income needs, and are instead driven by a sense of skepticism against the Istituto Nazionale Previdenza Sociale (INPS) managed universal pension scheme. During or right after negative financial market events, subscriptions to CGS soar, even though this may potentially worsen retirement income levels depending on long-term interest rates. Moreover, the Boards of 2nd pillar pensions are not always financial professionals: The lack of competences (and responsibilities) among pension board member translates into choosing low fee portfolio managers which in turn translate into gross returns similar to those of index fund, but just with higher costs.
"On the basis of the COVIP Report 2019, at the end of 2018, pension fund assets were mainly invested in debt securities (58.8 per cent), mostly government bonds, and 16.4 per cent of assets were invested in equities and 13.8 per cent in mutual funds. Domestic investments accounted for 27.7 per cent of total assets (€36.7 billion), most of which were government bonds. Investments in

[11] https://www.covip.it/sites/default/files/relazioneannuale/relazione_per_lanno_2021_0.pdf
[12] Ibid.

securities issued by Italian companies were limited: €3.7 billion (less than 3 per cent of total assets), of which €2.5 billion were bonds and the remaining amount was equities.” [13]

In order to encourage participation in Previdenza Complementare, certain tax incentives are offered: up to €5.164,67 of voluntary contribution are tax exempted. Furthermore, the taxation at the fund income’s level and at exit is significantly lower.

Debt Funding

Italian debt is diverse and covers both the retail and institutional market needs, but the average duration is just 7.02 years, with outstanding issuance in April 2023 of €2,334 mld and public debt as a percentage of GDP at 144%[14]. In addition to European-inflation linked securities described earlier, Italy has just issued BTP Italia, inflation-linked bonds targeted to retail investors, with denominations as low as €1,000 and relatively shorter maturities (but with a bonus if held to maturity). Additionally, BTP Futura exists and according to the Ministry of Finance (Treasury Department 2022), “The BTP Futura, which was first introduced in 2020 through two issues aimed at financing the measures launched by the Government in order to deal with the health and economic-financial crisis resulting from the Covid-19 pandemic, has reached its fourth issuance in 2021, thereby confirming its wide acceptance by retail investors. Indeed, in 2021, the government security reserved exclusively for the retail market was offered through two issues aimed at financing the measures launched by the Government to support the country's economic growth, with total funding of over EUR 8.7 billion.”[15] BTP Green maturing in 2035, a 10-year inflation-indexed BTP (BTP€i) is another issue which has been successful. In 2023, Italy has issued the BTP Valore[16], with a unique feature of allowing retail investors to purchase in slices of as little as €1,000.

Coverage and Literacy

In addition to the low levels of coverage of supplementary pensions, the levels of financial literacy among adults appears to be below the European average. Alessio et al (2020) report that, “The

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[13] https://www.lexology.com/library/detail.aspx?g=5ec45d25-869d-4f76-b68d-0310f5d6032c
[14] https://www.dt.mef.gov.it/en/debito_pubblico
[15] https://www.dt.mef.gov.it/export/sites/sitodt/modules/documenti_en/debito_pubblico/presentazioni_studi_relazioni/Guidelines_for_public_debt_management_2022.pdf
[16] https://www.borsaitaliana.it/obbligazioni/btp-italia/btp-valore-1a-emissione.en.htm

average level of financial literacy of Italians in 2020 is 11.2, on a scale ranging from 1 to 21, essentially in line with the value observed in 2017. The stability of the overall index hides variations in the three sub-indices. Financial knowledge recorded a growth of 0.4 points, while the behavior and aptitude indices fell slightly, by 0.2 and 0.1 respectively:4 only the first decline is statistically significant. The share of subjects who in 2020 recorded a knowledge score judged sufficient by the OECD – a score of 5 or more out of 7 - was 44.3 per cent, compared with 32.6 per cent in the last survey. The percentage of respondents for whom the behavior score is judged sufficient - 6 or more out of 9 - is stable compared with the last survey (27.3 versus 27 per cent). As regards attitude, however, the share of those who have a score equal to or greater than 4 (in the scale1-5) is 13.7 per cent, down from the last survey (18.8 per cent)."

III. The Innovative Design – Tesoro Obbligazioni per le Pensioni (TOP/BTTPI)

Italy is considering a pension reform focused on the 2nd pillar scheme as it will play a bigger role in Italian citizens' pensions role going forward.[17] A recent survey from Defined Contribution Institutional Investment Association's (DCIIA) Retirement Research Center (RRC)'s "Profiling Retiree Spending in 2022 sheds light on what (American) retirees want. The survey was conducted on 2,009 retirees, aged 50 – 75, and the most pertinent question to this paper was "Pick the action of the three presented that are the most and least important when thinking about your finances in retirement." The results of the survey are presented in Figure 4 below. While this is a study based on US retirees, one could expect that results in Italy might be similar and hence may be an interesting area of research for Italian academics.

[17] https://www.ipe.com/news/italian-government-paves-way-for-pension-reforms/10064312.article.

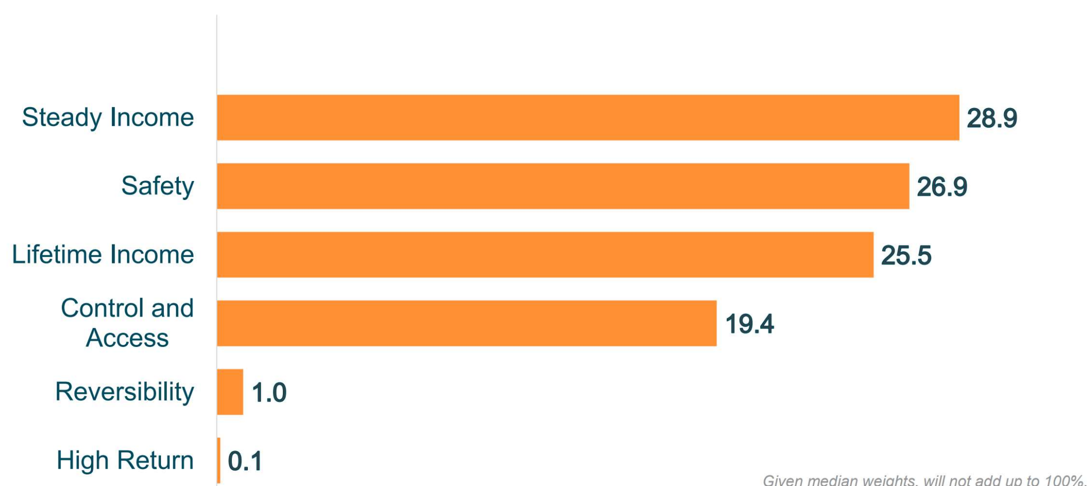

Figure 4: Median Preference Weights of American Retirees with Regard to Most and Least Important Aspects of Retirement Finance (Source: DCIIA RRC 2022[18])

Muralidhar (2015) and Muralidhar, Ohashi and Shin (2016) identify a new instrument that they call Bonds for Financial Security (or BFFS), with a real cash flow stream identical to the one shown in Figure 5. SeLFIES go one step further and incorporate the innovation of Merton (1983) of hedging standard-of-living risk and issuance/innovation by governments to complete markets. Since the safe asset in DC plans (focused on target retirement income) does not exist, SeLFIES are designed to mimic pension payments in Figure 1. Treasury can create and issue this new, simple, low-cost, liquid, and "safe" ultra-long bond instrument and they can be purchased directly by any individual (to create a type of "individual DB") or institution.

We recommend an efficient solution for Italy to address all these challenges and improve retirement security by creating and issuing an innovative new bond – TOP/BTTPI, the Italian version of SeLFIES. TOP/BTTPI is a single, liquid, low-cost, relatively low-risk (government-issued) instrument, easy-to-understand for even the most financially unsophisticated individual, because it embeds accumulation, decumulation, compounding and inflation-adjustments. These

[18] https://dciia.org/page/RRCResearch.

features make them consistent with the optimal design features highlighted by Visco (2008) and consistent with the objectives in Figure 4.

TOP/BTTPIs start paying investors upon retirement (i.e., forward-starting), and pay real income-only (e.g., €5 real/year), ideally indexed to aggregate per capita consumption (to hedge standard-of-living risk[19]), for a time period equal to a period linked to the average life expectancy at retirement (e.g., 20 years). Figure 5 shows a very simple cash flow chart of TOP/BTTPIs that start paying in 2063 for 20 years. The sharp negative bar in 2023 is the potential payment (an arbitrary price for this example) made today to acquire the desired retirement cash flow stream (i.e., the price of TOP/BTTPIs). TOP/BTTPIs are a purely market-based instrument and the market forces at the time of issuance will determine its issue price and its secondary market price. Most importantly, instead of current bonds that index solely to inflation, the **ideal** TOP/BTTPIs cover both the risk of inflation and standard-of-living improvements by indexing to per-capita consumption to ensure that retirees preserve their standard of living. This is critical especially since retirement planning is potentially a 60-year process and standard-of-living risk is a key unmanaged risk globally today.

[19] For example, with a linkage to Value-Added Tax or VAT for additional reasons explained later in Section IV.

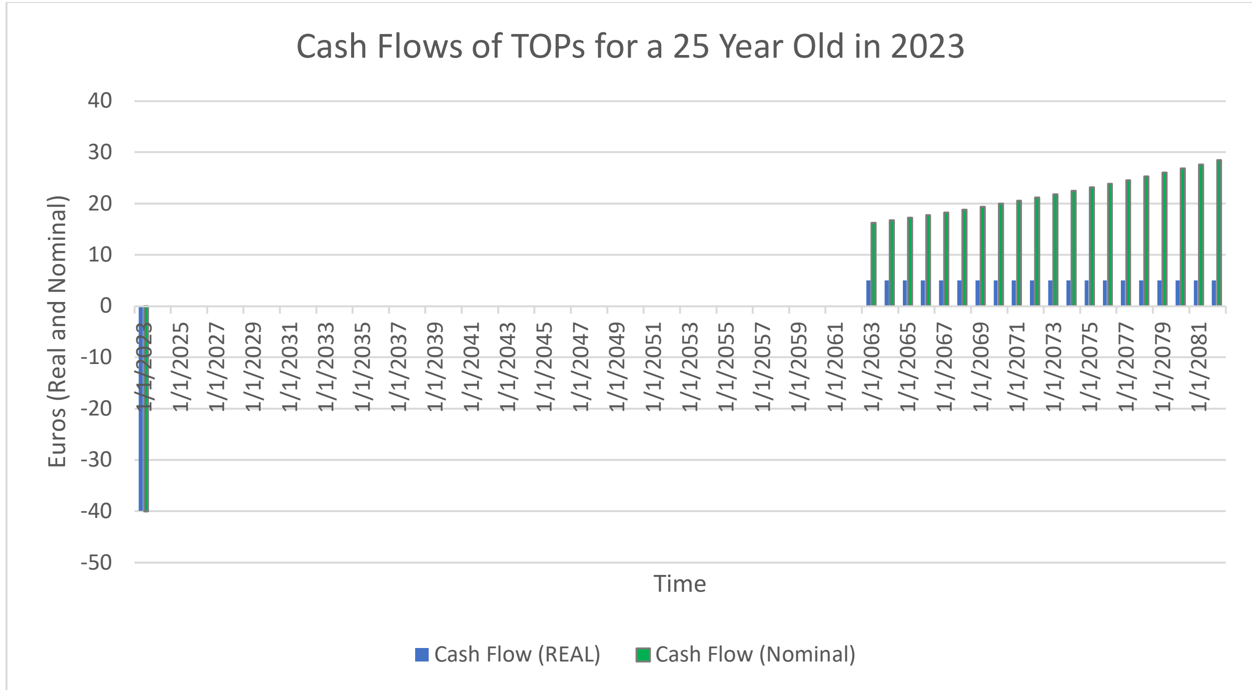

Figure 5: Real Cash Flows of 2063 TOP/BTTPIs: Pay €5 real/month from retirement date (2063) for 20 years (2083). Source: Authors' Calculations – assumes Inflation of 2% p.a. for illustrative purposes.

TOP/BTTPIs are designed to pay people *when* they need it and *how* they need it, and greatly simplify retirement investing. A 55-year-old in 2023 would buy the 2033 bond, which would start paying coupons at age 65, and keep paying, for say 20 years, through 2053. TOP/BTTPIs caters to all individuals independent of retirement date. For example, if our 25-year-old in 2023 wants to guarantee €60,000 annually (or €5,000 real/month), risk-free for 20 years in retirement as in Figure 1, to maintain their current standard of living, they would need to buy 1,000 TOP/BTTPIs (€5,000/month divided by €5/month) over their working life and the real and nominal cash flows of a single 2063 TOP/BTTPI are shown in Figure 5. Periodic DC plan statements can easily inform individuals as to how much retirement income they can expect to receive based on current holdings of TOP/BTTPIs (and conversion of other assets into TOP/BTTPIs-equivalents), relative to the target (1,000), thereby allowing easy course corrections prior to retirement. More importantly, as noted in Visco (2008), at the end of the Great Financial Crisis, these locked-in real income payments are unaffected by changes in the economy, interest rates or stock markets. In addition, TOP/BTTPIs can be bequeathed to heirs (who can then either continue to collect the coupons or

sell the TOP/BTTPIs in the secondary market). If TOP/BTTPIs are well-designed, they can also ensure longevity risk protection.

Visco (2008) further comments that, "DC plans require workers to make a number of difficult choices, such as whether or not to enroll, how much money to contribute, how to invest it and when to rebalance the portfolio." TOP/BTTPIs require only the most basic information and offer choices for buyers of any educational strata thereby addressing the financial literacy challenges noted in Alessio et al (2020). The two required inputs are anticipated date of retirement (i.e., the TOP/BTTPIs payment start date) and target income goal for a good retirement, which determines the number of TOP/BTTPIs needed to reach this goal. Since TOP/BTTPI payments are indexed to per capita consumption, they protect against future inflation and standard-of-living uncertainties. The buyer must simply set their goal at the level they currently live on, a number they already know and relate to in their everyday decisions. The three (current) complex decisions of saving, investing and decumulation (and forecasting inflation) are simply folded into an easy calculation of how many bonds to buy. In the case of Brazil, this result is displayed on the Treasury website and the app designed for this purpose. If they change their retirement date, they could easily sell/buy the relevant TOP/BTTPIs with little effort and cost. Even the most financially illiterate individual can be more self-reliant with respect to retirement planning. Since TOP/BTTPIs do not make payments until the retirement date, the buyer does not need to make any further transactions or decisions to reinvest coupon or principal payments during the entire accumulation period. One transaction, one time, for each TOP/BTTPIs purchased minimizes costs, decision effort and errors. In a way, one can see TOP/BTTPI as a "simplified term annuity in a bond". One transaction, one time, for each TOP/BTTPI purchased minimizes costs, decision effort and errors.

To be clear, TOP/BTTPIs cannot address the issue of insufficient savings that has afflicted many pension systems globally and probably Italy because of low coverage of Previdenza Complementare. If people do not buy enough TOP/BTTPIs, they will not have a good retirement, and TOP/BTTPIs by themselves can do nothing directly to change saving rates. It can provide a better understanding/knowledge to people on how they are doing in terms of saving for retirement [i.e., the funded ratio] because they understand income comparisons better than wealth-to-income comparisons. But just knowing they do not have enough for retirement will not ensure that they

will change their behavior to save more. Also saving without taking any risk with it will make it very hard for people to get to a good retirement because the amount to be saved is enormous compared to traditional saving practices. Finally, as TOP/BTTPIs makes clear, if one just saves and buys income instruments it does assure success; savings that goes into Italian Treasury long term bonds do not ensure a good retirement because if they are nominal bonds, they have inflation risk and if they are TIPS/ BTP€Is there is standard of living growth risk. In sum, if people do not save enough, no financial instrument is going to save them to obtain a good retirement.

There is the potential for TOP/BTTPI bonds to replace some of the allocation to CGS either on a voluntary basis or by allowing funds to invest directly (current legislation bans most funds from investing directly. After all, the real capital will still be guaranteed at maturity; they contribute to the retirement income; the tax benefit could be preserved if kept within Previdenza Complementare, or translated in capital premium as in the case of BTP Futura. If priced correctly individuals at the retail level that purchase the bond and hold it until maturity could convert the bond principal repayment into an annuity, as we show later in Section IV.

IV. Case Study of Brazil and Design Features and Impact on Improving Market for Retirement in Italy

Muralidhar and Vitorino (2023) provide a case study of Brazil's pension challenges and why issuing RendA+ bonds provided an instrument that was missing in financial markets and highlighted its key features. Those features are highlighted in recommending high level design features for Italy.

Issuance and Trading. The key issue to note is that TOP/BTTPIs will not be subsidized, but will be a pure market-based instrument; traded and issued like any other government bond in any country. Many countries like the United States, Japan and even Brazil also have "Treasury Direct" facilities which allow individuals to purchase government debt directly from Treasury thereby reducing transactions costs. Italy permits retail purchases, but appears to not have a Treasury Direct facility or an app/web-based mechanism to purchase these securities. Institutional TOP/BTTPIs should be issued through the traditional auction process, and traded in the aftermarket. The primary

participants in these auction and secondary markets are large institutions like insurance companies, pension funds, and asset managers, and this current market-based process ensures effective price discovery. These purchases can create innovative retirement income protected securities (RIPS) as opposed to CGS, which are risky from a retirement perspective. Thereafter, the market-based prices can be used as the basis for Treasury Direct or retail issuance, which is a low-cost channel for individuals who seek to purchase these instruments in fractional shares. This transparent price discovery process ensures that the prices at which TOP/BTTPI are sold to individuals directly are not subsidized or have to be rationed. Adopting current bond issuance processes for TOP/BTTPI ensures efficiency. Additionally, the concept of offering a bonus for buy-and-hold investors who purchase BTP Italia or BTP€I am probably worth continuing as that is market practice.

Brazil started with just a retail version of RendA+, but issued a detailed note on how the instrument would be priced prior to the launch to ensure market acceptance. It then took extensive efforts to educate the market of the benefits of RendA+. The instrument is issued through Tesoro Direto, and can be sold back to the National Treasury with very tight spreads. To encourage long-term holding and not speculative trading, there are limits on minimum holding period and also the custody and tax treatments are linked to holding period, incentivizing holding till one reach retirement, much like Italy.

Additionally, Brazil issued bonds with start dates of 2030, 2035, 2040, 2045, 2050, 2055, 2060 and 2065 to ensure that they covered the entire demographic spectrum of young to pre-retirement individuals. Muralidhar and Vitorino (2008) show that within 2 months, over 36,000 individuals had purchased RendA+, and it was most popular with the 40-59 age group, and there were non-trivial purchases made by the young. Additionally, investments totaling US$100 million were made in this set of instruments, including 8,500 new purchasers of government securities, thereby facilitating financial inclusion. This could be key to the reversing the low coverage challenge in Italy.

Level of Real Coupon and Indexation Choices. Merton and Muralidhar (2017a) argue that each country will need to decide on the appropriate level of real coupon that works for their target market. For example, Merton and Muralidhar (2017a and 2017b) argue for an annual $5 real

coupon for the United States, Merton, Muralidhar and Ferreira (2019) suggest an annual €5 real coupon for Portugal (and the EU), but Merton, Muralidhar and Vitorino (2020) suggested a BRL 0.04/month for Brazil, because the average income and the target population for Brazilian SeLFIES would require such a coupon. Instead, Brazil chose a more traditional issuance, with a 6.48% real coupon, indexed to the IPCA index, which was already a well-established index, and the payments will be made monthly (on the 15th of each month), to synchronize with Social Security payments.

Similarly, the appropriate index for nominal adjustments might differ by country as well. In Uruguay, the law requires that pensions be tied to growth in real wages, and hence if SeLFIES were issued, it may make sense to issue bonds indexed to wages for legal reasons, even though it may not provide ideal protection against standard-of-living adjustments.[20] Among the least ideal of the nominal indexation choices, Italy with extensive issuance of standard inflation-linked securities, may consider TOP/BTTPI linked to some traditional inflation index as a first step to creating the "ideal TOP/BTTPI" (because inflation indexation does not hedge changes in standard-of-living). The one advantage of linking to European inflation, and issuing in Euros as in BTP€I am that the demand for such instruments will extend well beyond the borders of Italy, as any European should want to purchase TOP/BTTPI, so there is a first-mover advantage. Indexing it to just Italian inflation will limit the universe of investors.

Most importantly, Brazil allows for the purchase of these bonds in fractional shares of as low as €5. As noted earlier, the mode of issuance through a simple website/app, make it possible to offer "SeLFIES on cellphones", thereby allowing uncovered workers and low-income workers to secure a safe pension, without having to formally set up a PIP or FPA, thereby lowering the future burden on the government. This even allows young people to start to save with small savings in a secure and liquid manner.

[20] The Ministry of Finance in Uruguay has recently issued wage-index securities with staggered principal repayment – a sort of variation on SeLFIES – to help local insurance companies hedge their annuity offering to individuals and try to complete the market and encourage private provision of annuities.

Longevity Risk Management. For TOP/BTTPIs to provide the same pattern of payments as a pension, it must address the lifetime payment feature and protect against longevity risk as well (Merton and Muralidhar 2019). Working- and middle-class citizens who reach retirement age [e.g., age 65] are a diverse group: some have economic responsibilities for several people and need to bequeath money to take care of their heirs. Others have no one else for whom they are responsible and, hence, have no motive to bequeath assets. For the latter, the annuity or a life pension is ideal because they maximize the benefit payment with no risk of running out and leave no "wasted" assets, when they no longer need money. When the person reaches retirement, they have the best information as to their health [i.e., personal life expectancy vs the population], they will know who they are responsible for besides themselves, and what other assets and commitments they have. With this information, they are best positioned to make an informed decision on how much to annuitize or not, and thereby implement a personalized plan for de-accumulation.

TOP/BTTPIs do not directly provide an embedded annuity feature of payments for life but it does contribute to longevity risk protection for those who do eventually select full or partial annuitization at retirement, while providing decision flexibility to those who do not want to annuitize. The ideal design calls for the number of years of payout to equal a period somewhat longer than the life expectancy for the cohort population at retirement. For example, if life expectancy at age 65 is 20 years [age 85], then the specified-payment period on the TOP/BTTPIs might be set at 22 years [age 87]. A well-run insurance company should be willing to exchange a life annuity with the SAME €5/month indexed real payment for the specified term of €5/month real payments on the TOP/BTTPIs. If so, then the retiree can simply exchange their TOP/BTTPIs for a life annuity with no extra payment and no reduction of retirement income level. Those retirees in different circumstances can adjust accordingly and potentially enjoy the built-in de-accumulation payments in TOP/BTTPIs with no further transactions.

Why would a well-diversified insurance company be willing to exchange one TOP/BTTPIs for a life annuity that pays €5 real/month till death (ignoring profit and cost considerations)? If the insurance company has insured a large group of diverse individuals in one cohort, then its net longevity realization should be close to the economy average of that cohort, with relatively low risk. TOP/BTTPIs delivered in the exchange is the perfect hedging instrument for the insurance

company's aggregate liabilities of this cohort. The somewhat longer payments on the TOP/BTTPIs than expected [22 vs 20 years] provide compensation to the insurance company for cost and profit. It becomes more interesting if the insurance company is also diversified across multiple cohorts. Hence, TOP/BTTPIs with a maturity a touch above the economy average could facilitate a much more efficient annuity market to ensure individual longevity risk mitigation. Both insurance companies and pension funds would be natural institutional buyers of large denomination TOP/BTTPIs and create price discovery through their auction.

Using TOP/BTTPIs to Create Better Investment Products. Currently, products like TDFs, on which the DoL in USA has conferred "safe harbor" protections or CGS in Italy, do not offer individuals any guarantee of target retirement wealth or income as shown in Section 1. Individuals defaulted into TDFs, especially with auto-enroll and auto-escalate programs, could easily reach retirement with extremely inadequate, retirement income (especially with low interest rates and statements focused on the level of assets). TOP/BTTPIs greatly enhance innovation by creating better guaranteed retirement income products or what are referred to as Target Income Funds (TIFs). Those seeking no risk, low-cost income instruments can invest all their savings in TOP/BTTPIs. For more risk-taking retirement funding strategies, that cater to individuals who cannot/do not save enough or have a higher risk tolerance, a well-run asset management company can use a dynamic allocation strategy between risky assets and TOP/BTTPIs, with TOP/BTTPIs as the "risk-free" asset that locks-in guaranteed retirement income – a highly desirable result (see Levitan and Merton 2015; Kobor and Muralidhar 2019).

V. TOP/BTTPIs – A Good Deal for the Italian Government

SeLFIES have been proposed (in chronological order) for regions/countries as diverse as Europe (Merton and Muralidhar 2016), US (Merton and Muralidhar 2017a and 2017b), France (Merton, Muralidhar and Martelleni 2017), India (Merton and Muralidhar 2018a), Australia ((Merton and Muralidhar 2018b), Japan (Merton and Muralidhar 2018c), Turkey (Merton and Muralidhar 2018d), Colombia (Garcia 2018), Korea (Merton 2018), Spain (Merton, Muralidhar, and Herce 2018), Portugal (Merton, Muralidhar and Pinto Ferreira 2019), and Brazil (Merton, Muralidhar and Vitorino 2020), among others. TOP/BTTPIs are potentially a good deal for the Italian governments, as they are consistent with the objectives of the Public Debt Guidelines 2023 and

encourages more retail ownership of government debt, while also addressing coverage and financial literacy concerns. In fact, the Italian governments is the biggest beneficiary as this bond combines the elements of BTP€Is, BTP Italia, BTP Green, BTP Valore, and BTP Futura. TOP/BTTPIs not only improve retirement outcomes for all citizens saving for retirement, but also have spill-over benefits.

The case for BTTPI is as follows:

- Italy has just issued BTP Italia, inflation-linked bonds targeted to retail investors, with denominations as low as €1,000 (and BTP Valore); Brazil allowed individuals to purchase RendA+ in slices as small at €5 (notice that the price and denomination are different so a 25-year old Italian could probably buy a bond with €1,000 denomination, that pays €5 real for 20 years to cost in the neighborhood of €40-50 with today's rates); TOP/BTTPIs are a simple extension of BTP Italia/BTP€I with a higher goal of improving retirement security.

- Italy issued BTP Futura bonds targeted to retail investors, during Covid-19, with a step-up structure and a loyalty premium for long-term holders; Brazil's RendA+ has similar features where long-term holders of the bonds get significant reduction of the custody cost, which is the same as an increase in returns or a loyalty premium.

- Italy has financing needs this year (especially with changes in the European Central Bank's portfolio holdings) that it wants local investors to hold long-term as it currently has over 40% of its debt held by foreigners. TOP/BTTPIs satisfy this goal. Interestingly, as per EU single market regulations, other Europeans could also purchase these bonds as they are denominated in Euro and, hence they bear no currency risk.

- Italy wants to issue Green Bonds and fund long-term infrastructure; TOP/BTTPIs not only improve retirement outcomes for all citizens saving for retirement, but also have spill-over benefits, and funds infrastructure which is a major challenge globally (as the cash flows of TOP/BTTPIs are synergistic with these long-term investments).

- The average life of Italian debt is 7 years; TOP/BTTPIs extends this maturity dramatically and potentially improves balance sheet management (as governments with value-added taxes have a hedge against future RSBs payments).

- Issuing TOP/BTTPIs will also allow for the development of better pension products by innovative asset managers, insurance companies, banks and pension funds since they would invest in such bonds, allowing them to hedge their liabilities from annuities or life income instruments they issued. TOP/BTTPIs as the safe asset also allows for robust risk-based regulation (Muralidhar 2018a). This way, the government not only helps to complete financial markets, but also improves overall sovereign debt management operations (through better hedging of revenues and bond payments, and potentially extending duration) and lowers the risk of retirement security.

- Finally, in Italy, all individuals that work full or part time in the private or public sector get approximately 1-month salary bonus every year called *Trattamento Fine Rapporto – TFR*), which can be used to invest in annuities or other pension instruments. The TFR could be easily partly or fully invested in the Italian RSB thereby helping individuals save substantially more for retirement and helps the government fund deficits.

VI. TOP/BTTPIs – As a Currency for Retirement

One of the challenges in preparing for retirement and anticipating likely pension outcomes is that we do not have a "currency for retirement"; namely a simple way to gauge the impact of changes in current economic policy on future retirement outcomes. One of the clearest indications of the unintended consequences of loose monetary policy in the 2000 – 2020 period has been the secular decline in funded status of DB pension funds (Cuomo and Wigglesworth 2019).

Examining the Impact of Economic Policies. Merton and Muralidhar (2015) show that central banks lowered rates in response to the GFC in the widely believed hope that these actions would stimulate consumption and investment through the "wealth effect". However, lowering interest rates led to big declines in the funded status of pensions (as liability values rose more than asset values). This decline in "relative wealth" caused a number of distortions not anticipated in traditional theory, especially in a population that is aging. Employers (both government and

corporate) were forced to contribute to their pension funds and older citizens and retirees struggled, muting the impact on consumption, investment and government spending (which might have been a more effective tool had these resources not been diverted to support pensions). Even the 2018 US tax reform resulted in an unintended outcome, in this liability-centric world – corporations had greater incentive to contribute to their pension funds, instead of paying dividends or investing in new capital, thereby resulting in fiscal policy potentially having limited impact on future growth.

However, had TOP/BTTPIs/SeLFIES existed, analysts would be able to see the immediate impact on retirement security. For example, in 2019, the US Federal Reserve and the ECB decided to embark on a policy of lowering rates again – which had an immediate impact on long term rates. If TOP/BTTPIs had existed, the immediate impact would have likely been a dramatic increase in the price of TOP/BTTPIs (since these are long duration instruments), immediately alerting individuals that planning for retirement just became a lot more expensive and would require additional saving relative to levels previously projected prior to rates being cut. This role as a "currency for retirement" could prove invaluable at examining the impact of a range of policy choices on retirement security well in advance of individuals reaching retirement and discovering that their savings are likely to lead to a paltry retirement income (as this is a challenge faced by Latin American countries). In addition, in countries with negative long term interest rates, this realization might force a different choice of policies that do not necessarily trade off retirement security for current growth.

Alternative Sources of Funding Retirement. One of the challenges with inadequate savings is that it will lead to poor retirement outcomes. As a result, other assets owned by individuals will need to be considered to bolster the retirement pot – with one asset in particular, one's house – holding potentially the greatest promise. Looking to financial innovation for the future, the current instrument to convert one's home into retirement income, the reverse mortgage (RM) in countries like in the United States, has not enjoyed sufficient success to make this a game changer. While there a number of changes that have been proposed to improve the RM contract (Merton 2015; Muralidhar 2018b), at a minimum, TOP/BTTPIs will allow individuals to clearly understand how much potential retirement income (and protection of pre-retirement standard of living), their current assets are likely to generate. This is an additional benefit to having a "currency for retirement".

VII. Summary

There is a looming retirement crisis, as individuals are increasingly being asked to take responsibility for their own retirement planning and a majority of these individuals are financially unsophisticated. They cannot perform basic compounding calculations and do not understand the impact of inflation, both critical aspects of retirement planning. Yet, these individuals are being tasked with the responsibility for three complex, interconnected decisions: how much to save, how to invest (with many additional decisions), and how to decumulate one's portfolio at retirement. Additionally, the PAYG system, INPS, already does not provide satisfactory retirement income making the need for complementary savings even more critical. However, currently in Italy, the coverage of people in the 2nd pillar systems is low and current products and regulation make these pension plans unwieldy.

Compounding these challenges, current investment approaches and products (e.g., TDFs or CGS) are risky because they focus on the wrong goal - wealth at retirement, as opposed to how much retirement income can be guaranteed to support pre-retirement standard-of-living. Moreover, annuities are complex, costly, and illiquid and seldom used. Without financial innovation and a change in the metric for measuring retirement success, many individuals will retire poor – a financially and socially undesirable outcome for any country. This paper presents an easy, quick and efficient solution for countries to address all these challenges and improve retirement security by creating and issuing an innovative new bond – TOP/BTTPIs. The TOP/BTTPIs bond is a single, liquid, low-cost, low-risk instrument, easy-to-understand for even the most financially unsophisticated individual, because it embeds accumulation, decumulation, compounding and inflation-adjustments.

TOP/BTTPIs is good for the Italian government too, as the bond lowers the risk of individuals retiring poor, improves balance sheet management, and funds infrastructure/green investment, while also increasing the share of retail investors in the holders of government debt. The paper also discusses key design aspects of TOP/BTTPIs to show how they can ensure longevity risk protection and protection against declines in standard-of-living, a key unmanaged risk globally today. Moreover, they can serve as a "currency for retirement".

TOP/BTTPIs is a win-win for all - it can greatly improve retirement funding security for citizens, provide a better cash-flow match, and fund infrastructure for the government. The time to act is NOW - the longer the delay, the higher the cost of ensuring retirement security for future generations and increasing the burden and cost to government and Italian citizens. In 1996, the late Prof. Franco Modigliani co-authored, "*Il Miracolo Possibile"*, to make the case for why Italy can join the Euro even with significant deficits. As his students, we feel that it is time to update *Il Miracolo Possibile – The Sequel,* to address the looming pension challenge with the introduction of Italian TOP/BTTPIs, as Italy can achieve this miracle!

Appendix – Occupational Pension Systems[21]

What are the main types of private pensions and retirement plans that are provided to a broad base of employees?

The main types of private pensions and retirement plans that are provided to a broad base of employees are closed pension funds and open pension funds.

Closed pension funds (the second pillar system) are set up through collective bargaining agreements (CBAs), including those signed at the company level, and are sponsored by trade unions as associations for the benefit of a particular group of employees. Examples of closed funds include:

- the Cometa pension fund, which is set up under the national CBA for employees in the metalworking and plant installation industries and related sectors;
- the Fonchim pension fund, which is set up under the national CBA for employees in the chemical and pharmaceutical industries;
- the Previndai pension fund, which is set up under the national CBA for executives in the manufacturing industry; and
- the Laborfonds pension fund, which is set up under a regional CBA for employees who work in the Trentino Alto Adige region of Italy.

Companies in the financial services sector – including insurance companies, banks and asset management companies – manage the assets of these pension funds.

In September 2019, membership of closed pension funds was about 3.1 million.

Open pension funds are created by financial services companies as specific, separate and autonomous assets. The beneficiaries of these funds are not limited to a particular group of people or employees, and membership can be on an individual or collective basis. In September 2019, membership of these pension funds was about 1.5 million.

[21] Copied verbatim from https://www.lexology.com/library/detail.aspx?g=5ec45d25-869d-4f76-b68d-0310f5d6032c.

There is also a third pillar system that provides individual pension schemes (PIPs), implemented through individual membership to the above-mentioned open pension funds or life insurance contracts. PIP assets are separate and autonomous within the companies. The beneficiaries of these funds are not closed or limited to a particular group of persons or employees. In September 2019, the membership of these funds was about 3.3 million.

In any case, membership of pension plans in the second and third pillars (all based on the funded system) is voluntary. The only types of the above-mentioned private pension and retirement plans provided to employees are based on defined contributions.

In addition, there are some old pension funds that were set up before the first law regarding private pensions came into force and are still in operation. These are both broad-based and non-broad-based pension funds. In September 2019, membership of these pre-existing pension funds was approximately 650,000.

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