RETIREMENT MANAGEMENT JOURNAL

Forthcoming in Volume 14, Number 1, 2025

Protected Modern Tontines: A New Approach to an Age-Old Problem

By David Blanchett, PhD, CFA®, CFP®, and Gabriel Richards, FSA

INVESTMENTS & WEALTH INSTITUTE®

Protected Modern Tontines

A NEW APPROACH TO AN AGE-OLD PROBLEM

BY DAVID BLANCHETT, PHD, CFA®, CFP®, AND GABRIEL RICHARDS, FSA

Abstract

Interest in strategies that provide longevity risk pooling without an explicit guarantee from an insurance company, typically referred to as tontines, has been increasing globally. In this paper, we introduce the concept of a "protected modern tontine" that combines a traditional fixed annuity with a tontine in a single product that generates lifetime income. This allocates the mortality and duration risks optimally between insurance company and tontine pool to maximize the income benefit, minimize the fees, and provide a structure that may be more appealing than either product individually. This hybrid approach may enhance interest in tontines and change the narrative around how tontines can be used as part of an efficient retirement-income solution.

Introduction

Financial advisors, defined contribution (DC) plan sponsors, and retirees increasingly are looking for strategies that can simplify the process of generating retirement income, especially retirement income that is protected for life. Insured solutions such as annuities are the predominate lifetime income strategies used today; however, structures that provide longevity risk pooling without the explicit income guarantee, typically referred to as tontines, have been making a global resurgence.

Despite the widely acknowledged potential benefits of tontines (Fullmer 2019), questions regarding their legality in the United States remain. Even when the legal barriers are addressed, overall demand for strategies that provide longevity protection with an uncertain benefit is unclear, especially in the DC space given the relatively risk-averse nature of plan sponsors.

Therefore, we introduce in this paper the concept of a "protected modern tontine," which combines a traditional fixed annuity (or series of annuities) with a tontine in a single product that generates lifetime income. This structure allocates the mortality and duration risks optimally between the insurance company and tontine pool to maximize the income benefit, minimize fees, and provide a structure that may be more appealing than either product individually.

Using annuity quotes, we create a protected modern tontine where approximately 80 percent of the initial investment would be allocated to the insured portion, i.e., is fully guaranteed, with the remainder invested in a tontine, which would be invested entirely in equities. Our structure would allow access provisions for 50 percent of the initial investment (via commutation provisions), provide a minimum guaranteed annual benefit that is 4 percent of the initial investment, and ensure the shareholder would be guaranteed to receive 100 percent of the initial premium via period certain payments.[1]

Although a protected modern tontine may be expected to generate less income than a pure modern tontine, on average, it significantly outperforms a self-annuitization strategy as well as other annuitization strategies. As a result, a protected modern tontine can be especially valuable compared to other strategies that provide only nominal income benefits, e.g., single premium immediate annuities and deferred income annuities. We believe this approach could lead to a wider adoption of tontines, as well as more open discussions about how tontines can potentially play a meaningful role in improving outcomes for retirees.

Tontines: A Quick Primer

We provide a brief overview of the rich field of literature on tontines and recommend Fullmer (2019) or Milevsky (2022) for a more thorough exploration of the subject. Note the term "modern" in the name of our product; this term is borrowed specifically from Milevsky, who has been one of the strongest proponents of tontines for at least the past decade, to differentiate from original versions. Modern tontines are designed to offer more flexibility than the original versions. For example, modern tontines can offer varying payout structures, potential access to the initial investment, and aren't necessarily "winner-take-all" pools.

Virtually all U.S. retirees receive some type of income benefit that is guaranteed for life, typically via a public pension such as Social Security retirement benefits. A retiree who wanted to generate additional income that is protected for life would have to purchase some type of annuity, such as a single premium immediate annuity (SPIA), a deferred income annuity (DIA), or a product that includes a guaranteed living benefit, e.g., a guaranteed lifetime withdrawal benefit (GLWB). Annuities are fully insured products and offer the explicit protection of the issuing insurance company.

Tontines are named after Lorenzo de Tonti, a 17th-century Neapolitan banker who allowed a group of individuals to pool longevity

risk using a variety of potential payout (or income benefit) structures. The defining attribute of the tontine is the lack of any explicit guarantee around the benefits; the expected benefits vary depending on the performance of the portfolio and the mortality experience of shareholders in the pool.

A tontine may be structured in a variety of ways. Early versions were winner-take-all arrangements, which make them common plotlines used in movies as an incentive to murder other shareholders. Some tontines offer a single payout for individuals who survive to some predetermined age or number of years, and others provide regular income. There also can be provisions allowing access to the original investment, as well as refund provisions that ensure some minimum benefit is received by shareholders. Each of these provisions obviously would affect the benefit structure; however, just because a provision benefits shareholders doesn't mean payouts couldn't also increase to the extent those provisions induce less-healthy individuals to join because they could still benefit compared to self-annuitization.

... TONTINES COULD STILL BE ESPECIALLY ATTRACTIVE TO RETIREES WHO ALREADY HAVE A SOLID BASE OF LIFETIME BENEFITS THAT IS ALREADY FIXED AND FULLY GUARANTEED ...

Tontines were phased out in the United States at the beginning 20th century due to abusive practices by insurance companies. They recently have made a resurgence globally, however, with product offerings in the United States, Canada, and Australia, among other regions. Although questions regarding their legality remain, there is a relatively broad consensus, at least among retirement academics, that tontines could be a valuable way to improve retirement security as a cheaper and simpler method of providing longevity protection compared to annuities and other insurance products.

Insurance companies are highly regulated, which creates expenses that ultimately need to be paid for by customers. Further, insurance companies must hold significant capital against the risks they are guaranteeing, such as mortality, investment, and credit risk. These aspects increase the cost of obtaining insurance; however, they are not present for tontines. The higher expected income benefit of tontines would be accompanied with additional uncertainty, but tontines could still be especially attractive to retirees who already have a solid base of lifetime benefits that is already fixed and fully guaranteed, i.e., Social Security benefits.

Tontine Adoption Outlook

Modern tontines are similar to variable immediate annuities in that the tontine shareholder is maintaining the investment risk (and reward) of the performance of the underlying securities. In addition to participating in the investment performance, the tontine shareholder also is participating in the mortality performance of the pool.

Variable immediate annuities can produce more favorable outcomes when compared to traditional fixed immediate annuities because the annuitant benefits from the equity risk premium and the insurance company is required to hold less capital. In 1957 J. Edward Day, an insurance executive and future U.S. Postmaster General, touted the benefits of variable immediate annuities:

> *To this date, the variable annuity contract is the only practical means available to obtain a life income which will correspond to changes in the cost of living and will grow in accordance with the expansion in the nation's economy.*

Although these words are as true today as they were nearly seven decades ago, variable immediate annuities are not popular insurance products. There are a variety of reasons why this is the case, such as the lack of the explicit guarantee around the income benefit (and the potential implications of a drop in income during an equity tail-risk scenario), as well as things such as high cost and complexity. Similarly, the lack of an explicit guarantee with modern tontines may impact wider adoption negatively as they become available, especially for more risk-averse entities, e.g., DC plan sponsors, and in markets where longevity guarantees have been common. Cost and complexity also are likely to be issues with tontines, although the extent will vary by structure.

Protected Modern Tontines

The protected modern tontine is designed to allocate the mortality and duration risks optimally between the insurance company and tontine pool to maximize the income benefit, minimize the fees, and provide a structure that may be more appealing than either product individually. The protected modern tontine couples a tontine income stream, which is inherently variable, with the fixed and guaranteed income stream that an insurance company can provide.

There are two key components to the protected modern tontine: a group annuity contract (GAC) and the tontine. The GAC would provide fixed and guaranteed income benefits and could be issued by either a single insurance company or a group of insurance companies, similar to a pension risk transfer (PRT) arrangement. The monies in the pool not allocated to the GAC would be allocated to the modern tontine. The tontine would first collect the entire pool of money during an aggregation process and, in turn, purchase the GAC; and the modern tontine would commence on a specified date. This assumes the tontine effectively closes after the aggregation period, although it also could remain open. We assume a closed design as a simplifying assumption, especially given the insurance component of the structure.

How the monies are allocated between the GAC and the tontine would vary depending on the desired structure of the protected modern tontine. For the purposes of this analysis, we design a product that would

TABLE 1 Annuity Payout Rates

PERIOD (YEARS)	CASH REFUND	PERIOD CERTAIN ONLY	LIFE WITH PERIOD CERTAIN	LIFE ONLY
0	6.78%	n/a	7.31%	7.31%
5	9.88%	21.41%	7.34%	10.61%
10	15.39%	11.93%	7.11%	16.77%
15	26.25%	8.88%	6.88%	28.70%
20	47.69%	7.47%	6.57%	54.70%

Source: CANNEX

be reasonably attractive to retirees and relatively efficient. As such, we assume there is going to be a regular annual income benefit (versus a single bullet payout structure) and that the shareholders—i.e., owners of the respective pool—desire some level of liquidity regarding the initial premium or investment amount. We further assume there is a minimum lifetime guaranteed annual benefit as well as the assurance that the shareholder will get back at least the initial investment, regardless of life expectancy but ignoring the time value of money. Each of these features can be relatively expensive, so the specific design is especially important for this component.

For our design we use a series of annuity quotes obtained from CANNEX, an online marketplace for annuities in the United States and Canada, obtained on March 26, 2023, and included in table 1. We fit a third-order polynomial to the respective quotes by period for each annuity type to capture the general relationship as well as how it could potentially vary for different terms, e.g., how much a 12.5-year period certain only annuity theoretically would cost.

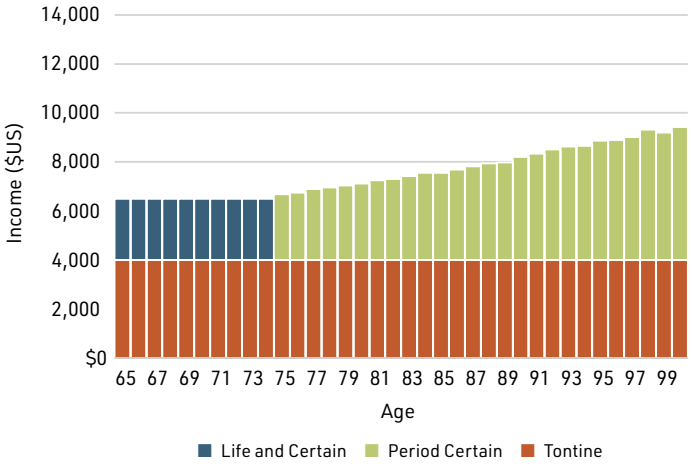
For our protected tontine, we assume that 50 percent of the initial investment would need to be accessible via SPIA commutation functions, 100 percent of the initial investment would be returned through period certain payments, and there would be a minimum 4-percent guaranteed annual lifetime benefit.

Given the annuity quotes, and a targeted 6.5-percent initial payout rate, we solve for the portion that would need to be allocated to the GAC. In this case, it is approximately 80 percent of the total and 81.13 percent to be exact, and the remainder would be allocated to the tontine. Note we assume the monies allocated to the tontine are illiquid and nonrevocable once the contract has commenced.

Income from the protected modern tontine would be fixed for the first 10 years, and distributions from the tontine would commence in the 11th year. Starting in the 11th year, income from the strategy would be a combination of whatever is generated from the tontine plus the guaranteed payment floor benefit of 4 percent of the initial investment.

We assume the tontine is invested 100 percent in equities. Although this is obviously a relatively risky allocation, it is important to place this risk in the larger context of the strategy itself, because the remainder of the initial investment (which is approximately 80 percent of the total)

FIGURE 1 Decomposing the Income from a Protected Modern Tontine (Median Outcome)



Source: Authors' calculations.

is effectively invested in bonds given the guaranteed nature of the benefit payments. Equities also can serve at least as an implicit hedge against inflation, especially over the long term (Siegel 2022).

The discount rate to determine the payout rate for the tontine, using a mortality-weighted net present value calculation, is also 4.5 percent. This is a relatively conservative assumption that at least partially backloads the income benefits. A higher discount rate could be more suitable in an actual product to minimize concerns around intergenerational transfer.

Figure 1 provides some perspective on the structure of the income benefits using the median outcome in a series of projections that are explored more fully below.

Using an insurance company to generate the fixed returns via the GAC has the potential to generate better returns than simply investing in publicly traded bonds because insurance companies source a greater pool of assets with a higher illiquidity premium than investors could on their own or via public market instruments. This places most of the systemic longevity tail risk on the tontine (and thus the tontine shareholder) versus the insurer, which results in an effective form of risk sharing because systemic longevity risk can be more difficult to hedge when considering things such as adverse selection and potential mortality shocks. The expected income benefit increases in the median outcome but is not guaranteed; we provide additional context on the distribution of expected outcomes below.

Note the initial assumed payout rate of 6.5 percent is slightly lower than the initial payout from a nominal life annuity that includes a cash-refund provision, which is approximately 6.8 percent; or a nominal annuity that includes a period certain benefit that would effectively ensure the annuitant would receive the initial premium back in payments, which is approximately 6.9 percent.

Protected Modern Tontine vs. Alternative Retirement Funding Approaches

Here we explore the potential income generated from a protected modern tontine versus other approaches to funding retirement. One important consideration with tontines is the potential impact of mortality experience on the income benefit. With guaranteed products, e.g., annuities, the insurance company manages mortality risk, but this risk falls on individuals in the pool in a tontine.

It would be possible to purchase "tail insurance" on mortality in the tontine pool; however, we believe this would be relatively expensive and not cost effective. One obvious way to reduce idiosyncratic longevity risk in a tontine is to ensure that a sufficient pool of investors exists. Although estimates of this minimum viable size vary based on the respective structure, for our analysis we assume the pool includes 1,000 subscribers. The actual required number of shareholders could be larger or smaller depending on a variety of factors, such as the allowable investment range, whether the pool is gender-restricted, and if additional underwriting factors are considered.

To demonstrate how the potential pool of shareholders in a tontine could change, we conduct an analysis using the mortality rates in the Society of Actuaries 2012 Immediate Annuity Mortality Table with Improvement.[2] This mortality table illustrates that the expected mortality of individuals who purchase a tontine is similar to that of those who purchase an annuity, who are notably healthier than the average American. The analysis assumes random initial loads between –30 percent and +30 percent and random changes to the individual year rates from –90 percent and +90 percent, neither of which are assumed to be known ahead of time. These are extreme adjustments intended to capture errors in potential mortality forecasts as well as the unique risks that could exist within a given pool.

IT WOULD BE POSSIBLE TO PURCHASE 'TAIL INSURANCE' ON MORTALITY IN THE TONTINE POOL; HOWEVER, WE BELIEVE THIS WOULD BE RELATIVELY EXPENSIVE AND NOT COST EFFECTIVE.

Figure 2A includes information about the number of survivors for the first 10 runs in a 1,000-run trial assuming an initial cohort of 1,000 shareholders. Figure 2B includes the distribution of implied withdrawal rates from the portfolio using an assumed interest rate of 4.5 percent.

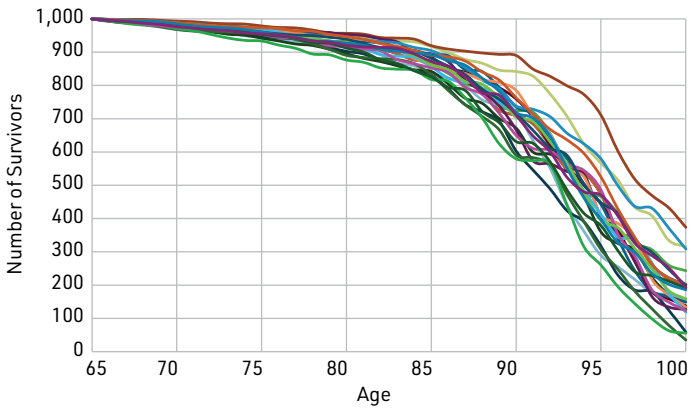
There are notable differences in individual scenarios (see figure 2A) that could affect withdrawal rates (see figure 2B). Note this analysis doesn't include the additional potential impact of market returns, which would result in a greater deviation in the distribution of potential dollar benefits.

For our analysis, we assume expected returns on stocks and bonds are 9.5 percent and 4.5 percent, respectively, with standard deviations of 18.0 percent and 6.0 percent, respectively, with a zero correlation. An additional 0.5-percent fee is deducted from any type of portfolio or tontine structure to reflect asset management and administration fees. The allocation within the protected tontine is invested 100-percent in equities.

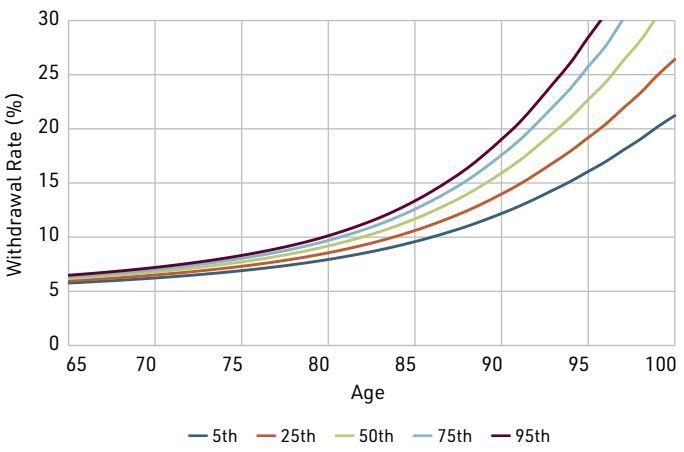
The withdrawal rates for either the tontine or self-annuitized approach are based on the mortality weighted net present value of expected mortality, using a 4.5-percent discount rate, where mortality is based on the Society of Actuaries 2012 Immediate Annuity Mortality Table with Improvement.

FIGURE 2 Mortality Experience

A: Mortality Experience for First 10 Runs



B: Distribution of Implied Withdrawal Rates



Source: Authors' calculations.

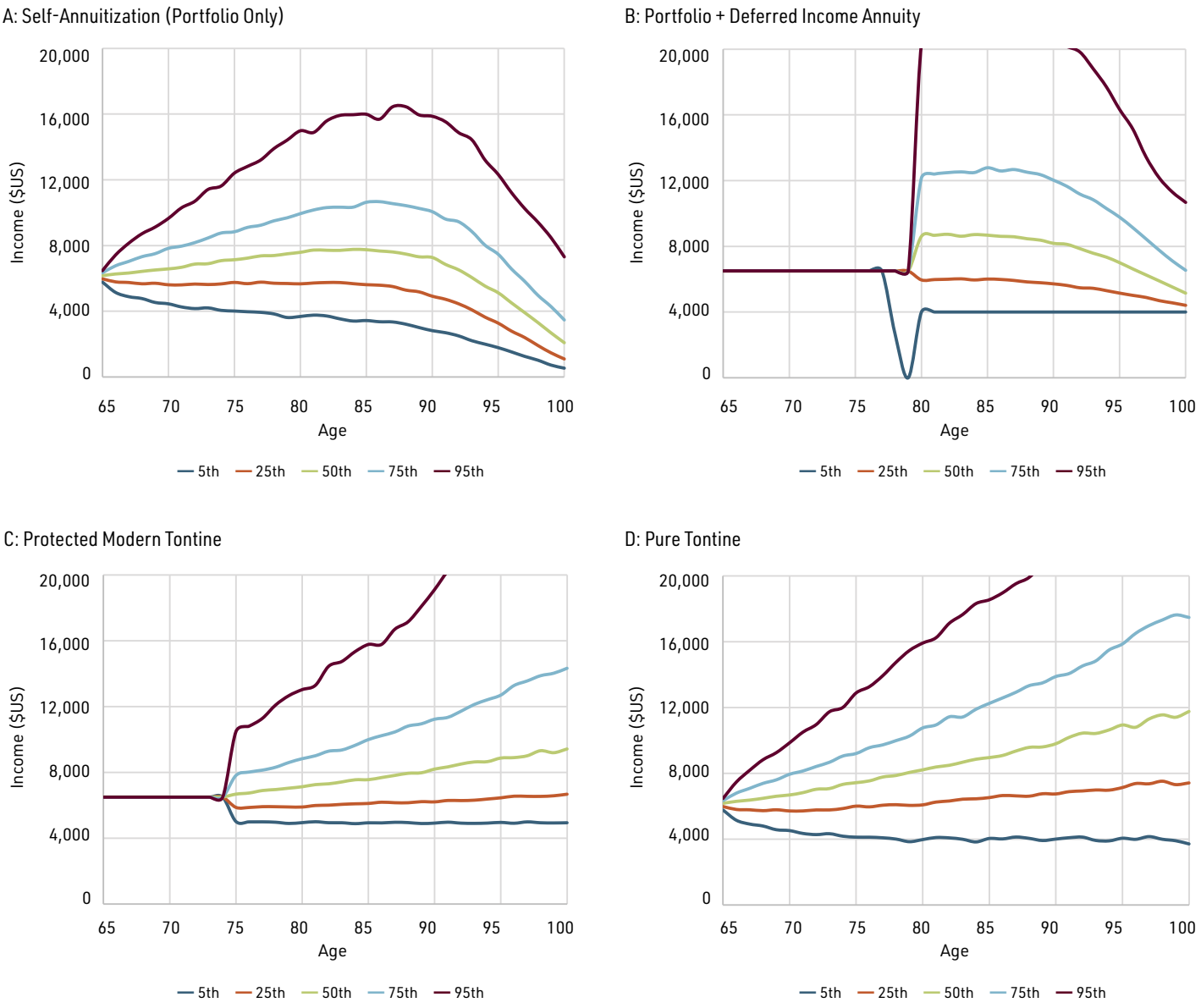
The regular modern tontine is invested in a portfolio that is 60-percent equities, as is the portfolio for the self-annuitization strategy. For the DIA, income commences in 15 years. We target the same 4-percent floor generated by the protected modern tontine and, given a payout rate of 29 percent, the initial DIA allocation is 13.79 percent of the initial balance.

The analysis assumes the portfolio allocations remain constant for the entire duration of retirement. In reality, it could make sense for the allocations to change based on a predetermined schedule or dynamically as the funded status of the product changes. For example, if the benefits from the tontine are above some target level, the allocation to risky assets could decline to create more certainty around future income levels.[3] Taxes are ignored for the analysis.

Figure 3 provides information about the distribution of expected income from the four approaches.

There isn't necessarily one strategy that would dominate all other strategies economically when considering the myriad retiree preferences, e.g., around access, bequest motives, but the protected tontine provides a highly attractive income profile, especially compared to self-annuitization and an approach leveraging a deferred income annuity. Although the protected modern tontine generates less income than the pure tontine, on average, the protected modern tontine has significantly

FIGURE 3 Income Differences by Strategy



Source: Authors' calculations.

more guarantees that many retirees would find attractive, which could improve the mortality attributes of the pool compared to retirees who purchase traditional insured products.

Implementation Considerations

Construction

It's important to note that there are many ways to structure a protected modern tontine. This analysis used simple immediate annuities to pair with the tontine, but other retirement products that offer fixed payment streams could be introduced that may further optimize the results. Examples could be fixed deferred annuities with a GLWB or fixed indexed annuities with a GLWB. Further, this analysis allocated 80 percent to the insured portion, i.e., the GAC; however, this could be adjusted based on the capital market environment at the time or the risk tolerance of the tontine shareholders.

Tontines need scale to dilute idiosyncratic longevity risk, including the risk that the mortality of pool participants differs significantly from the greater population or typical annuity purchasers. They also need to narrow the age band of those who are accepted into the tontine. For example, the tontine pool should not be open to ages 50–80 because the longevity risk profiles are too varied. Keeping the tontine age banded to 5 or 10 years would be ideal, and withdrawal rates can be adjusted for the different ages within the tontine on an actuarially equivalent basis, e.g., 62-year-olds would receive a different benefit amount than 67-year-olds.

Institutional Pricing Benefitss

Tontines should be cheaper to manufacture than traditional insurance products due to their lower capital requirements and enhanced operational efficiency. In addition, given the tontine is gathering assets, a large portion of which will be used to purchase a GAC, the benefits of the GAC itself may be better than the retail immediate annuity quotes used in this paper. This is due to two reasons:

1. The GAC will be bundled and purchased on a single day similar to a PRT contract. The PRT industry is a competitive growing market, much larger than the SPIA market. The fact that the GAC the tontine is buying could be put out to bid in a competitive process could clearly improve outcomes for retirees.
2. Individual SPIA contracts have upfront distribution costs that reduce customer benefits. In contrast, the protected tontine reduces the amount of work for the insurance company because many contracts are priced all at once via the GAC. The protected tontine also reduces distribution costs because the tontine, rather than insurance agents, gathers assets. Together these two items ultimately should increase the benefits.

Conclusions

Protected modern tontines represent a compromise to the traditional tontine structure because the variable payout nature of the former is combined with a more traditional set of immediate annuities providing both a minimum lifetime income benefit and guarantees around access and return of premium. This compromise and combination of benefits is not a new concept. As J. Edward Day wrote in 1957:

> ***If individuals could have used about one-half of their retirement savings to buy variable [immediate] annuities based on common stocks and had put the rest of those savings into fixed-dollar annuities, the combined income from the two types of annuities would have provided a fairly constant amount of purchasing power, much more stable than either type of annuity would have provided by itself. The fixed-dollar annuity would have helped to keep the combined income from declining too drastically when the value of the common stock investments dropped while the variable annuity would have provided some protection against loss of purchasing power when prices rose.***

The adoption of protected modern tontines may hinge on packaging this simple guidance, which is particularly relevant in the current inflationary environment. By combining the ease of mind of a fixed payment floor and upside potential via an allocation to equities in the tontine, the protected modern tontine could be commercially viable and provide a more optimized retirement solution.

We believe that the protected modern tontine is a step toward a more optimized, balanced, and protected lifetime income solution that potentially could significantly improve retirement outcomes for many households today.

David Blanchett, PhD, CFA®, CFP®, is a managing director, portfolio manager, and head of retirement research for PGIM DC Solutions. Contact him at david.blanchett@pgim.com.

Gabriel Richards, FSA, is an actuary at Prudential and a variable payout annuity enthusiast. Contact him at gabriel.richards@prudential.com.

ENDNOTES

1. These specific assumptions could vary depending on both client preference and market environment.
2. See : https://mort.soa.org/ViewTable.aspx?%20&TableIdentity=2581.
3. Note: Alternatively the risk could increase, because the implied risk capacity is greater.

REFERENCES

Day, J. E. 1957. Variable Annuity Is Not a Security. *Notre Dame Law Review* 32, no. 4: 642–687. https://scholarship.law.nd.edu/ndlr/vol32/iss4/4.

Fullmer, R. 2019. *Tontines: A Practitioner's Guide to Mortality-Pooled Investments*. CFA Institute Research Foundation. https://rpc.cfainstitute.org/sites/default/files/-/media/documents/article/rf-brief/fullmer-tontines-rf-brief.pdf.

Milevsky, M. 2022. *How to Build a Modern Tontine: Algorithms, Scripts and Tips*. Springer Nature. https://link.springer.com/content/pdf/10.1007/978-3-031-00928-0.pdf.

Siegel, J. 2022. *Stocks for the Long Run*. Sixth Edition. McGraw-Hill Education.

INVESTMENTS & WEALTH INSTITUTE®

5619 DTC Parkway, Suite 600
Greenwood Village, CO 80111
Phone: +1 303-770-3377
Fax: +1 303-770-1812
www.investmentsandwealth.org