

Retirement Tontines:
A New Way to Finance Retirement Income

J. Mark Iwry, Claire Haldeman, William G. Gale, David C. John*

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I. Introduction

Households face two related but distinct financial challenges as they prepare for retirement: first accumulating enough retirement savings during their working years, and then spending down their assets wisely after retiring. A substantial literature, reaching a wide range of conclusions, examines the extent to which households are saving adequately for retirement.¹

But there is more consensus about the challenges households face when deciding how best to spend down their savings. People do not know how long they or their spouse will live, not to mention what their health care costs and investment returns will look like, which makes them prone either to consuming too much too soon, leaving them with insufficient resources as they age, or consuming too little and thus having a lower standard-of-living in retirement than they could have afforded.²

Managing assets in retirement has become a more widespread problem over time as lifespans have increased and as more retirees depend on defined contribution (DC) retirement savings plans rather than defined benefit (DB) pensions. Although DB plans pay benefits at regular intervals, typically monthly, for the retiree's lifetime, DC plans seldom do.

Despite these trends, take-up of private annuities has remained low.³ Other financial products, such as managed payout funds, have certain advantages but are not yet available to households in most retirement plans.⁴ These circumstances leave many households without

¹ Engen, Gale, and Uccello (1999); Scholz, Seshadri, and Khitatrakun (2006); Munnell, Hou, and Sanzenbacher (2018); Biggs (2020); and Bipartisan Policy Center (2016).

² Of course, people may want to provide bequests to others. Even so, given a level of desired bequests, people face the same problem of ensuring they do not consume their resources too quickly or too slowly.

³ Iwry et al. (2019).

⁴ John et al. (2019).

satisfactory ways to convert their retirement savings into income.

We explore the potential for a different financial product—a tontine—to help people manage their assets in retirement. Tontines are investment pools where members commit funds irrevocably and where the assets of members who die are given to members who survive. Tontines can be adapted to a wide variety of financial structures. They have financed everything from European wars to colonial-era capital projects to Americans’ retirement. They were quite popular in the United States in the late 1800s and early 1900s but were effectively – though not literally – outlawed in response to corrupt insurance company management.⁵

The “tontine principle”—that surviving group members benefit financially from the death of other members—can evoke strong reactions, and has inspired murder plots in novels, movies, and even a *Simpsons* episode.⁶ But the mechanisms involved are not very different from how group annuities operate.

In recent years, analysts have revisited tontines as a theoretical tool and a number of countries have created pension plans that incorporate tontine principles. Some current retirement products in the United States have a tontine-style structure as well.

Our central premise is that tontine-style products could play a significantly broader role in financing the retirement of U.S. households. Tontines could provide higher returns than annuities do, but without the same guarantees. They would be valuable to those who would like considerable insurance against their own longevity without requiring certainty about the level of future income.

II. How Tontines Work

⁵ For an overview, history, and analysis of tontines, see Milevsky (2015).

⁶ See “Raging Abe Simpson and His Grumbling Grandson in ‘The Curse of the Flying Hellfish.’”

A. A simple example

The basic idea behind a tontine is that a group of people pool their investments and when members of the group die, their shares of the pool are divided among surviving members.

Suppose each of 10 people who are identical for mortality purposes (e.g., same age, race, sex, etc.) irrevocably invests \$100,000 to create a \$1 million investment pool. The pool buys a bond that earns 4% interest (\$40,000) per year and pays the interest out as an annual dividend. When all members are alive, each receives \$4,000 per year ($\$40,000/10$) as a “base return.”

When a member dies, their share is divided among the survivors. Thus, after the first death, each surviving member receives an additional \$444 ($\$4,000/9$) per year as a “mortality credit” in addition to their \$4,000 base return. Over time, the aggregate annual interest payment of \$40,000 stays the same but is divided up among fewer and fewer survivors, so annual payouts to each survivor grow. When the surviving group reaches a specified terminal condition, such as only three survivors remaining, the \$1 million in principal is divided equally among them, and the arrangement terminates.

Although each participant receives income for life, this structure would be unsuitable as a retirement income tool because the return to survivors rise sharply as members age and more pool members die. In contrast, most theory and evidence suggest that people prefer age-consumption profiles in retirement that are constant or declining.⁷

B. Flattening the Curve – The Level-Payout Tontine

To address retirement income needs, Milevsky and Salisbury (2015) propose a tontine in which the total return to survivors stays constant over time, which they call a “natural tontine,”

⁷See Hurd (1987), Butrica, Goldwyn, and Johnson (2005), and Banerjee (2014).

and which we call a “constant-payout” or “level-payout” tontine.⁸ Their approach is simple and elegant: invest in bonds paying cash flows that generate a declining base return over time to offset the gradual increase in mortality credits so that the total return stays roughly constant over time (Figure 2).⁹ The level-payout tontine offers the same expected lifetime payout as the simpler tontine, but better matches most retirees’ needs and preferences by paying more income to begin with and holding the income level constant over time.

In practice, the pace at which tontine members actually die is uncertain and will vary from expectations, so if the declining base return schedule is set in advance, based on expected mortality, the tontine’s total return will vary over time. However, if the pool is sufficiently large (e.g., 1,000 members), the expected variation in payouts over time is small. Moreover, adjusting the base return annually based on the actual previous mortality experience of the pool can almost entirely eliminate this variation.

C. Pooling Heterogeneous Participants

In the examples above, each tontine member is assumed to have identical mortality risk. In those circumstances, mortality credits would be actuarially fair if they were divided equally for each dollar invested. But if the members face different mortality risks, this approach would favor those with low mortality risk and disfavor those who face high mortality risk. A tontine covering heterogeneous participants can be designed to avoid favoring one participant over another. Fullmer (2019) shows that, to achieve an actuarially fair tontine, for each participant alive at the start of each period, the expected gains (the member’s expected mortality credits

⁸ This principle has other antecedents, including in the work of Piggott, Valdez, and Detzel (2005), and Sabin (2010).

⁹ Forman and Sabin (2015) propose a similar level-payout tontine but would create level payouts over time by having the tontine fund repay parts of the initial principal over time in a manner that offsets the increasing level of mortality credits.

times the probability of surviving) should equal the expected losses (the member's balance times the probability of dying). Satisfying this “fair transfer” constraint determines the appropriate allocation of mortality credits and allows people with differing life expectancies and initial balances to participate on an equalized basis. The provisions of a fair tontine depend only on the participant's probability of surviving and initial balance. Should they survive the period, members with higher ex ante probabilities of dying would receive higher credits, as would those with higher initial balances. This makes sense, as they are risking more by participating in the pool.

III. Practical Considerations

A. Legal Uncertainty

While modern tontines would be substantially different than the products that were banned over a century ago, their legal status remains unclear. Because the New York statute, still on the books, prohibits only tontine-style investments that pay out less frequently than once a year, and only a few state statutes explicitly bar tontines, we proceed on the assumption that U.S. law will not flatly prohibit all tontine-like structures (i.e., pooling and allocation of mortality credits). For example, the U.S. has long allowed “participating life annuities,” which pair an income guarantee with a variable surplus distribution depending on the actual mortality of the pool of investors. Similarly, some life annuities periodically adjust payouts based on the realized mortality of the pool of annuitants, so they— not the insurance company—bear the risk of the pool living systematically longer than expected. Despite these examples, the U.S. is lagging the rest of the world in tontine-like arrangements.¹⁰ Pensions with tontine features are offered in several advanced countries and are authorized generally in the European Union.

¹⁰ See Fullmer (2019), Hayashi (2020), Milevsky (2015), Milevsky and Salisbury (2015), and Nobuntu (2020).

B. Complexity and transparency

In theory at least, tontine-style pooling is straightforward, transparent, and fair, especially compared to commercial annuities. In practice, of course, complications will arise. Accurately estimating mortality risk, adjusting the base return, leveling total return, and investing in equities to boost expected returns will complicate a tontine. It remains to be seen whether adjustments for actuarial fairness and to produce a level retirement income would be administratively feasible. Of course, similar considerations about complexity and fairness also apply to other retirement income products. As an example, while it is fairly simple to determine the monthly income an annuity will pay, it is virtually impossible to determine exactly how that amount was determined.

C. Profiting from the Death of Others

The survival-contingent payout that underpins the tontine is both highly controversial and utterly ordinary. The idea of deliberately arranging to profit from other people's death naturally makes people squeamish. But a little perspective is warranted. First, the perverse incentive is absent when the group participating is sufficiently large or, even if small, when members are mutually anonymous.¹¹ Second, annuities regularly pool mortality credits without controversy. In those cases, mortality credits are less visible because they go through the insurer, which also takes a portion of the credit as increased revenue. DB pension plan funding also pools longevity risk. By contrast, in tontines mortality credits directly benefit the survivors rather than being partially hidden in the role of a financial intermediary.

D. Spousal Protection

Tax-qualified retirement plans provide protection for spouses. DB and certain other

¹¹ Apparently there have been no recorded episodes of actual attempts to kill off other members of a tontine. See *The Economist* (2017).

pension plans must pay pre- and post-retirement survivor annuities to a surviving spouse after a married participant's death unless the participant and the spouse agree to waive that right. In 401(k)s and most other DC plans, a deceased participant's spouse inherits by default the participant's full account balance unless the spouse agrees to the designation of a different beneficiary.¹² In both cases, the spouse's agreement generally must be written and either notarized or witnessed by a plan official.

Tontines outside of tax-qualified plans could provide similar protections.¹³ An unmarried participant and a married participant whose spouse agreed to waive these rights could participate in the tontine as an individual. But a tontine might also provide that a married couple that did not waive the spousal protections could participate in a tontine as a single unit, receiving payments and mortality credits until the second spouse's death, at which point the couple's interest in the pool would be reallocated to surviving participants. For example, the life expectancy of a 65-year-old male is about 84, but if married to a 65-year-old female, the couple's "last survivor life expectancy" is 91.¹⁴ In allocating mortality credits, the couple could be treated as a single participant with a life expectancy of 91.¹⁵

¹² See ERISA (1974) § 205 (29 U.S.C § 1055), "Qualified Pension, Profit-Sharing, and Stock Bonus Plans" (26 U.S.C. § 401(a)(11)), and "Definitions and Special Rules for Purposes of Minimum Survivor Annuity Requirements." (26 U.S.C. §417).

¹³ The paper on which this policy brief is based briefly addresses a number of ways in which the qualified plan rules might apply to tontine-type structures.

¹⁴ See IRS Publication 590-B (2019), Table II (Joint Life and Last Survivor Expectancy). Life expectancies vary slightly depending on which actuarial table is used.

¹⁵ The mortality credit allocations would also need to consider the adjusted levels of retirement income payable while both members are alive and then to the surviving spouse. A retiree who is entitled to income of \$1,000 per month if payable as a single life annuity (a stream of payments only for that retiree's lifetime) could, if married, receive a joint and survivor annuity payable to the retiree for life and then continuing to the surviving spouse for life. However, the payments made while both spouses are alive generally would be reduced (for example, to \$900 per

E. Equity and Discrimination

An equitable allocation of mortality credits would ensure that tontines do not discriminate against people with shorter life expectancy or in favor of those with longer life expectancy. Life expectancy varies with age, gender, race, ethnicity, income level, marital status, and other factors. As discussed above, if tontines could take all these factors into account, they could generate equitable allocations of mortality credits.

Existing law may forbid some adjustments of this type, even if intended to favor traditionally disadvantaged groups, like Black Americans, that tend to have shorter life expectancies. For example, commercial annuities and other insurance products are generally allowed to engage in price discrimination because of life expectancy differences based on age and gender but not race. In contrast, employer-sponsored pensions are not allowed to discriminate in benefits or contributions based on gender or race and can only discriminate (because of life expectancy differences) based on age in certain specific ways.

For tontines that are offered neither by insurance companies nor by an employer-sponsored plan, it is unclear how current law would apply to all the possible adjustments for mortality risk. Racial disparities in life expectancy present a particular problem for tontines, as well as for any product that pays benefits until a person dies, including Social Security, commercial annuities, and defined benefit pensions. Because Black Americans, for example, tend to have shorter life expectancies than white Americans, Black participants in a tontine

month) in order to fund the survivor benefit, and the survivor benefit frequently would be a fraction (often 50% or 75%) of the \$900 per month joint benefit. Other aspects of such a spousal protection tontine would also need to be addressed, including how actuarially fair mortality credit allocations should take into account the fact that married individuals tend to have longer life expectancies than unmarried and the possibilities of divorce, the spouse predeceasing the participant, or the couple's waiver of post-death spousal protections.

would likely be disadvantaged compared to white participants if no adjustment were made to offset this disadvantage.

We highlight this issue because it must be addressed when implementing tontines, but we do not attempt to resolve it here. Determining how current law should be applied, interpreted, clarified, or changed raises complex and difficult questions that are beyond the scope of this paper.

IV. Conclusion

Everything old is new again, as the adage goes. Tontine-inspired structures to finance retirement are receiving more attention around the world because they are efficient and transparent: mortality credits accrue to pool members directly and traceably, outside the commercial annuity insurance system. While commercial annuities guarantee a specified income for life, tontine pooling offers more expected income with less but still meaningful protection at what should be a lower cost. They would not require the charges insurers need to impose or the reserves they need to maintain to cover their annuity payment guarantees and insurance against systematic longevity risk. Tontines would also require less and less costly regulation. For many people, the marginal value of *complete* protection against income risk that an annuity provides may not be worth the marginal costs involved, especially as historically low interest rates have depressed returns.¹⁶

Public policy is only beginning to grapple with the challenges of effectively managing retirement security in a market dominated by 401(k) and IRA savings structures and lump-sum payouts rather than DB plans. The extent to which tontines will penetrate the market despite legal uncertainties and other concerns remains to be seen, but given the limited diffusion of

¹⁶ Friedman and Warshawsky (1990); Mitchell et al. (1999).

annuities and managed payout funds, tontines offer an attractive alternative that should be an option households can access to help manage longevity risk and finance retirement.

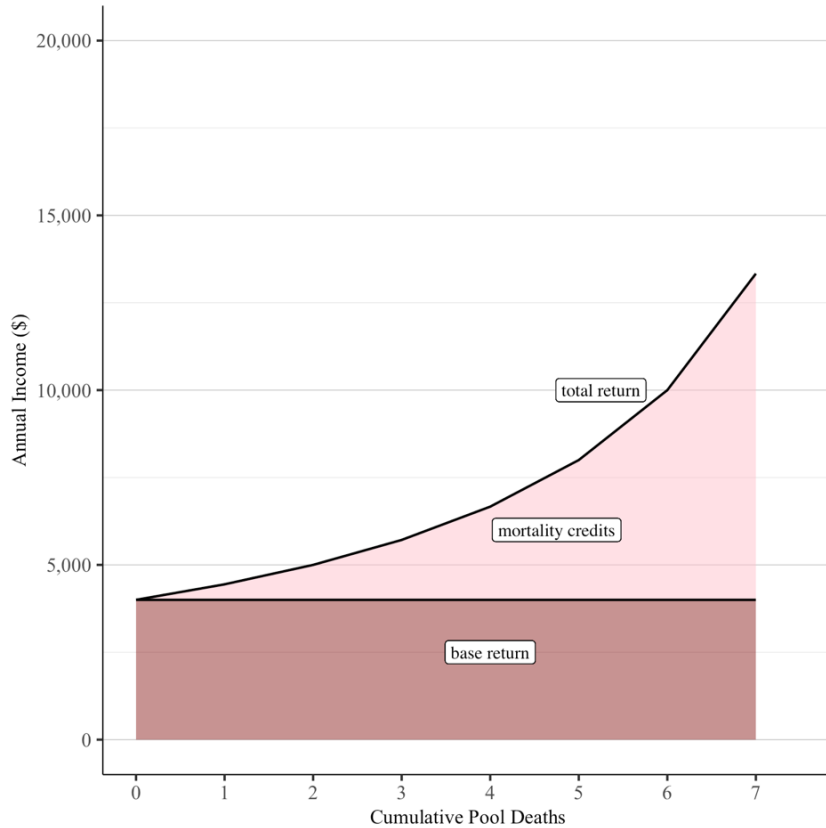
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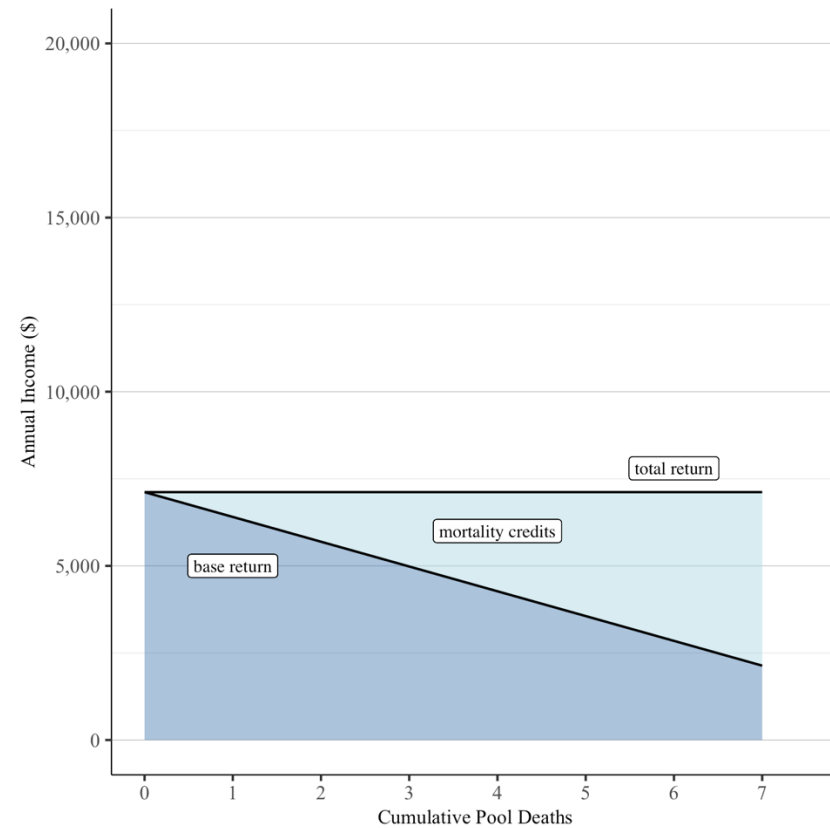
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Figure 1. Tontine Income by Pool Mortality

A. Constant base return



B. Constant-payout (with declining base return)



Notes: This figure compares the behavior of two stylized tontines with 10 participants who have each contributed \$40,000 to the pool. In the “constant base return” tontine (A), the fund disburses 4% of the overall investment annually, creating a guaranteed 4% base return per survivor each year. Over time, as more participants die, their base return is redistributed to the survivors in the form of mortality credits, generating an escalating total return for survivors over time. In the “constant-payout” or “level-payout” tontine (B), the base return is designed to decline over time to offset the increase in mortality credits, so that the total return to a survivor remains constant over time.