Could "tontines" expand the market for longevity insurance?

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COULD "TONTINES" EXPAND THE MARKET FOR LONGEVITY INSURANCE?

BY GAL WETTSTEIN*

Introduction

A big challenge facing retirees is how to draw down their nest egg in retirement. The main consideration is insuring against "longevity risk" – the possibility of outliving one's savings – without unduly restricting spending. One solution is to buy an annuity, which converts wealth into an income stream that is guaranteed until death. Common annuities include Social Security and traditional employer pensions. However, Social Security is not intended to be the sole source of retirement income and pensions in the private sector are rapidly disappearing, so buying an additional annuity with savings is often a good idea. Yet few people actually do.

Many reasons exist for the lack of annuitization. These include the complexity of the product and the fear of giving up one's wealth and then dying too soon to "break even." A simpler reason is price, since annuity prices include a premium to protect the insurer selling the policy against longevity risk.[1] Given the lack of interest in annuities, some policy experts have begun advocating an alternative form of longevity insurance – a "tontine" – which would require insurers to assume less risk and, in turn, charge lower premiums. Tontines, which do not currently exist in the marketplace, are the topic of this *brief*.

The discussion proceeds as follows. The first section describes a basic tontine and how it differs from an annuity. The second section discusses the legal status of tontines. The third section explores the central tradeoff of a tontine: lower cost for less insurance. The fourth section describes a way to eliminate a potential downside of the payout pattern of tontines. The final section concludes that some of the enthusiasm for tontines is well placed but drawbacks also exist.

What Is a Tontine?

A tontine (named after 17th century Italian financier Lorenzo de Tonti) is formed when a group of people pool their resources and risks to redistribute wealth from the dead to the living. A simple tontine involves a group of investors who each buy a share of a fund that pays out returns that are divided among the remaining living members. The biggest difference between tontines and other standard investments is that last piece – only the living get paid; the dead and their heirs get nothing.[2] In contrast, when a mutual fund owner passes away, his share goes to his estate's beneficiaries.

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So far, a tontine sounds just like an annuity. The notion that only living members get paid a benefit is a common feature of both tontines and annuities (at least annuities without survivor benefits). But the two vehicles differ in their payout streams and treatment of risks. A tontine guarantees an equal share of the fund's returns for all investors, which is only a relatively modest amount of income initially. However, the actual yield to the surviving participants increases as other investors die. In contrast, an actuarially fair annuity guarantees a higher payout to start, but no growth in the amount paid as people die.[3]

The original tontines were run by monarchs, who used the pool of money from tontine investors to finance wars or pay off debt. The attraction for the crown was that tontine participants were willing to loan money at a lower interest rate than traditional lenders in exchange for the possibility of "winning the gamble" and collecting higher payouts over time. This original tontine was not specifically designed as a retirement instrument, as the payout could be set to begin for individuals of any age, even children.

The current conversation among economists and finance experts, though, focuses on the potential of tontines to offer longevity insurance for retirees.[4] For example, consider an illustrative payout pattern over a 30-year period in which all tontine participants start at age 65 (see Figure 1). This illustration assumes that participants pay $10,000 up front to join a tontine with a constant 4-percent real interest rate. Payouts increase for surviving participants as other partici-

Figure 1. Per-Survivor Payouts from a Basic Tontine and a Fair Annuity

Notes: See Endnote 5.
Source: Author's calculations assuming cohort mortality at age 65 from U.S. Social Security Administration (2017).

pants die. For comparison, the figure also displays the payout from a fair annuity with the same initial investment. The payment streams of the two instruments have the same expected present value.[6]

Since tontines sound pretty similar to an actuarially fair annuity but with a slightly different benefit payout, a logical question is: why do they not exist? The answer is rooted in the past.

Are Tontines Legal?

The first tontine in the United States was marketed by a company called Equitable in 1868. Soon after, most other U.S. insurance companies followed suit and, by 1905, an estimated 7.5 percent of national wealth was held in tontine policies.[7] This widespread popularity of tontines in the past may be one reason people are enthusiastic about trying to bring them back.[8]

These historical tontines differed from the basic tontine described above, because they did not pay out regular benefits. Rather, they accumulated returns and assets forfeited by those who exited the tontine with the promise of a payout to survivors when the tontine dissolved after a specified period (typically 20 years).[9] These tontines therefore led to a large build-up of assets managed by the insurance companies, since no money was going out over the initial period. Lax regulation, coupled with the large accumulated funds at insurers' discretion, ultimately led to extensive corruption, culminating in the Armstrong Commission in New York State in 1905. The commission recommended prohibiting financial schemes without annual payouts, rendering tontines, as they were set up *then*, illegal in New York. Other states followed suit, and within a few years tontines disappeared.

What remains unclear is whether regulations barring the tontines of the early 20th century would apply to a basic tontine today– a product with a modest guaranteed annual payout that rises as members die. Such a tontine might be legal. But is it a good idea?

The Tontine Tradeoff: Lower Cost for Less Insurance

One problem with annuities is that premiums tend to be high because the insurer bears the risk of their customers living longer *on average* than expected. This systemic longevity risk is magnified because the people who benefit most from an annuity, and are thus more likely to buy one, are those who expect to
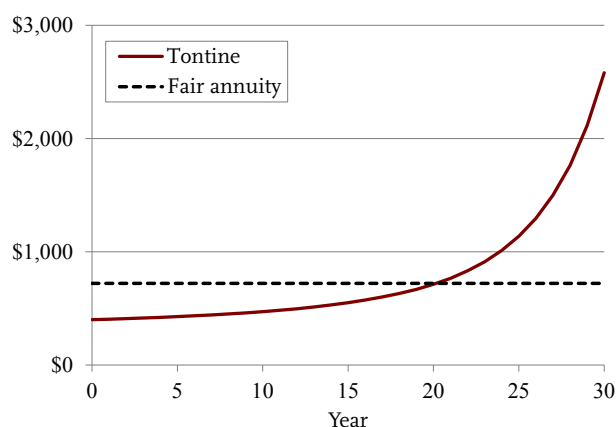
live a long time. Such a risk to the insurer can also occur due to a medical breakthrough, such as a cure for cancer, that leads to an unanticipated increase in average lifespans for the whole population in the potential risk pool. The main advantage of tontines is that they take this risk off the provider, making the product cheaper. Conversely, a negative of tontines is that the risk is passed onto the customer instead.[10]

If tontine participants generally live longer than expected, each one would receive smaller payments than originally anticipated (see Figure 2), since the tontine provider divides the same total annual payout among a larger number of survivors.[11] The provider's job is thus simple and does not even require an insurer, just an administrator. In contrast, an annuity provider needs to keep a buffer of assets in case the pool of participants lives longer than expected in order to maintain the promised level of payments. Consequently, the need for such insurance requires the firm to charge a risk premium that makes the expected return in a competitive annuity lower than the expected return in a tontine.

Thus, the choice between tontines and annuities comes down to how much a participant is willing to pay in lower returns to eliminate the risk of all participants living longer on average.[12] The annuity eliminates this risk for the participants, but the tontine does not.

A Tontine Providing Steady Expected Income

Aside from the smaller amount of insurance that tontines provide, the pattern of the payments could also be a drawback. As noted, individuals who survive a long time enjoy a sharp increase in the size of their payment.[13] However, receiving a lot of money when one is very old may not be that useful if health problems limit its enjoyment. A way to address this potential concern is to modify the payout pattern. This option, called a "natural tontine," would provide the steady expected payouts associated with an annuity.[14]

Here's how it would work. Consider a group of investors with similar survival probabilities who all invest in a natural tontine at the same age. To achieve a steady expected payout, the tontine administrator would tie the total payout at any time (summed over all survivors) to the expected survival probabilities of the investors. The payout per participant would be calculated using an "annuity factor," which gives the expected value of an income stream based on the group's survival probabilities and an interest rate.[15]

FIGURE 2. PER-SURVIVOR PAYOUTS FROM A BASIC TONTINE AND A FAIR ANNUITY, UNDER EXPECTED AND HIGHER-THAN-EXPECTED SURVIVAL RATES
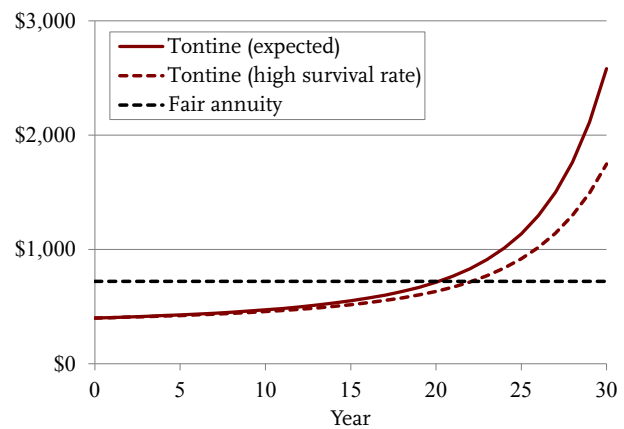
Notes: See endnote 5. The "higher survival rate" scenario assumes survival rates are 20 percent higher than expected. *Source*: Author's calculations assuming cohort mortality at age 65 from U.S. Social Security Administration (2017).

Under the payout calculation, *total* payouts from the tontine would decline over time along with the survival probabilities of members, but the payout *per survivor* is expected to remain constant because it is pegged to the expected mortality of the average participant. For example, the probability of a 65-year-old surviving to age 85 is about 56 percent. So, for a tontine in which all participants enter at age 65, the total payout in the twentieth year would be 56 percent of the payout in the first year.

However, the natural tontine still does not cover systemic longevity risk so, if the pool as a whole is unexpectedly long-lived, the payment that each individual receives would no longer remain level but instead decline over time just as under a basic tontine.

Conclusion

Some finance experts believe that tontines could offer a more appealing way to provide longevity insurance than annuities. The main reason is that tontines are less expensive than annuities. However, the flip side is that they also provide less insurance. Specifically, tontines do not guard against the systemic risk that the pool of participants will live longer than actuaries expect. If tontines did exist, they would likely make the most sense as part of a larger portfolio that also includes some liquid wealth and annuities.

Endnotes

1 See Sass (2016).

2 In some such schemes, the principal of the tontine fund is eventually distributed to the final (or final few) investors still living – potentially a large fortune.

3 Of course, an insurer must charge some premium above the actuarially fair price, but the notion of a fair annuity provides a benchmark for comparison with a tontine. A fair annuity offers the same expected present value at the time of purchase as the cost of buying it. Inflation-adjusted annuities have nominal benefits that grow over time with inflation. A tontine, as described, would have a similar property, since it would pay out real returns.

4 Milevsky (2015).

5 Figure 1 assumes all participants enter at age 65, the investment earns a 4-percent real return, and the principal of the tontine is distributed among those who live past age 95.

6 After 30 years, the tontine payout *conditional on survival* begins to become much larger than the annuity, even in present value terms.

7 Ransom and Sutch (1987).

8 See, for example, *The Washington Post* (2015), *The Economist* (2017), *The New York Times* (2017), and Pechter (2018).

9 Other differences included participation in the tontine being based on paying regular installments as opposed to one initial lump sum; forfeiture of assets not only in case of death but also in case of lapsed regular payments; and a pairing of all these tontine policies with a life insurance policy. For details, see Ransom and Sutch (1987).

10 A second source of longevity risk is "individual risk," when a few individuals live longer than expected. With either annuities or tontines, individual risk becomes less and less likely as the pool becomes large due to the law of large numbers. For example, if there is a 1-percent chance of dying during a year, then any five people are very likely to all survive; however, we would expect close to 10 out of 1,000 people to die. Thus, as the pool grows, individual longevity risk to the insurer declines. In contrast, the size of the pool does not have any effect on systemic longevity risk.

11 Of course, survival rates could also be lower than expected, which would yield higher-than-expected tontine payouts.

12 A new study (Milvesky et al. 2018), using Canadian data for recent decades, finds that a typical annuity would have yielded a somewhat lower return than a hypothetical tontine.

13 Regarding the game-like nature of a tontine, Adam Smith wrote about the optimism bias which might drive participation in such a gamble: that people are often overconfident in their own likelihood of living a long time and are therefore willing to participate in the "tontine lottery" (Smith 2000).

14 See Milevsky (2015) and Milevsky and Salisbury (2015).

15 This amount is equal to the cumulative survival probability to year j of the tontine, $s(j)$, discounted by the gross interest rate, $1+R$, compounded to year j, summed over all the years of the tontine until the final year, ω: $\sum_{j=1}^{\omega} s(j)\,(1+R)^{j}$.

References

The Economist. 2017. "And Then There Were None." (June 17). London, United Kingdom.

Milevsky, Moshe A. 2015. "King William's Tontine." New York, NY: Cambridge University Press.

Milevsky, Moshe A., Thomas S. Salisbury, Gabriela Gonzalez, and Hanna Jankowski. 2018. "Annuities Versus Tontines in the 21st Century: A Canadian Case Study." Schaumburg, IL: Society of Actuaries.

Milevsky, Moshe A., and Thomas S. Salisbury. 2015. "Optimal Retirement Income Tontines." *Insurance: Mathematic and Economics* 64: 91-105.

The New York Times. 2017. "When Others Die, Tontine Investors Win." (March 24). New York, NY.

Pechter, Kerry. 2018. "In Canada, 'LIFE' Begins at 85. (March 22). Emmaus, PA: *Retirement Income Journal*.

Ransom, Roger L. and Richard Sutch. 1987. "Tontine Insurance and the Armstrong Investigation: A Case of Stifled Innovation, 1868-1905." *Journal of Economic History* 47(2): 379-390.

Sass, Steven A. 2016. "How Can We Realize the Value that Annuities Offer in a 401(k) World?" *Issue in Brief* 16-12. Chestnut Hill, MA: Center for Retirement Research at Boston College.

Smith, Adam. 2000. "The Wealth of Nations: with Introduction and Notes by Robert Reich." New York, NY: Random House.

U.S. Social Security Administration. 2017. Unpublished life expectancy data from the Office of the Chief Actuary. Baltimore, MD.

The Washington Post. 2015. "It's Sleazy, It's Totally Illegal, and Yet It Could Become the Future of Retirement." (September 28). Washington, DC.

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