

## ABSTRACT

This literature review explores the role research suggests annuities should play in retirement portfolios, drawing on a wide range of academic studies and industry analysis. The fundamental advantage of annuities is their provision of lifetime income, which protects retirees from outliving their assets and therefore reduces the pressure to underspend early in retirement so as not to run out of money later. But purchasing an annuity requires trading in a substantial amount of assets, which could hinder a retiree's ability to weather financial shocks or to benefit from strong market returns. Weighing these competing interests, the literature strongly suggests that annuitization should play a key role in optimizing retirement portfolios but remains without a consensus on exactly how. The breadth of protected income products on offer in today's market further complicates efforts to draw clearcut conclusions, and more research is needed to develop straightforward recommendations for consumers.

# THE ROLE OF ANNUITIES IN AN OPTIMAL RETIREMENT PORTFOLIO: A REVIEW OF THE LITERATURE

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## INTRODUCTION

The landscape of retirement planning has undergone significant changes over the past few decades, with a notable shift from defined-benefit (DB) plans to defined-contribution (DC) plans. This shift has brought the role of annuities into sharper focus, as retirees grapple with the challenge of ensuring a steady income stream while minimizing the risk of outliving their assets. Annuities, with their provision of a guaranteed lifetime income stream, have emerged as a potential solution to these challenges. But the question of how to optimally incorporate annuities into a retirement portfolio remains a subject of ongoing debate among researchers and industry stakeholders.

This literature review provides a practical overview of the current body of research on the role of annuities in retirement portfolios, drawing on a wide range of academic studies and industry research. The review is divided into four main sections. The first section explores the theoretical underpinnings of why annuities are beneficial additions to a retirement portfolio. The second section delves into the extent to which research suggests annuitization, focusing primarily on single premium immediate annuities (SPIAs). The third section discusses the role of different types of annuities including variable annuities, fixed index annuities (FIAs), and registered index-linked annuities (RILAs), in retirement portfolios. Finally, the fourth section outlines open questions that remain for researchers to explore.

## THE VALUE OF ANNUITIZATION

Research on retirement security generally assumes that retirees care about three financial goals: meeting minimum day-to-day spending needs, minimizing the risk of running out of money, and maintaining sufficient reserves to weather financial shocks or leave bequests. But the

shift in recent decades from DB plans, which provide regular “paychecks” in retirement, to DC plans focused on asset accumulation has made the first two goals harder to achieve. A significant body of research on safe withdrawal rates has sought to provide clarity on how retirees can accomplish these goals through self-directed decumulation of their assets (see, e.g., Salter and Evensky 2008), but there is increasing concern that some standard rules of thumb, such as a 4% drawdown strategy, are no longer appropriate (see, e.g., Finke et al. 2013). There is also increasing emphasis by researchers and industry stakeholders alike on annuitization as a superior strategy.

The fundamental advantage of annuities is their provision of lifetime income, which protects retirees from outliving their assets (Babbel 2008; Davidoff et al. 2005). Annuities accomplish this via mortality credits—essentially, the money left over when an annuitant dies earlier than actuarial tables predict which is then used to fund payouts to unexpectedly long-lived annuitants. This guarantee, however, can provide significant benefits even to those with shorter lives by providing what Blanchett and Finke (2021) call a “license to spend.” Retirees spending down their assets without the structure provided by an annuity can feel pressure to *underspend* early in retirement to ensure they do not run out of money later. Removing that fear with a lifetime income guarantee, however, provides retirees with a license to spend that income. By the same token, annuitization provides substantial protection against sequence-of-returns risk—the danger that a market downturn near the time of retirement will lead to normal withdrawals for lifestyle expenses having irreversible negative impacts on the portfolio’s growth and sustainability. (Finke and Pfau 2015).

Moreover, the expected effect of annuitization on liquid assets is not uniformly negative. Adding annuities to a retirement portfolio reduces that portfolio’s risk, which can free retirees to allocate a greater proportion of assets to higher-risk, higher-return equities. Under many market conditions, this can ultimately *increase* assets at death when compared to a traditional stock-and-bond portfolio, even though annuitization requires a large depletion of liquid assets at retirement to procure

the guaranteed income stream.<sup>1</sup> (Ameriks et al. 2001; Malhotra 2012; Horneff et al. 2015)

Annuities can achieve these ends while reducing the risk of financial ruin and the overall magnitude of failure. Blanchett and Finke (2021) argue that by providing a steady, guaranteed income stream, annuities can give retirees the confidence to spend more of their savings, knowing that they will not run out of money. At the same time, annuities can help protect against the risk of financial ruin due to longevity risk or poor investment returns.

There are, however, potential drawbacks to annuitization. Purchasing an annuity requires trading in a substantial amount of assets, which could hinder a retiree’s ability to weather financial shocks or to benefit from strong market returns. Moreover, in strictly financial terms, those with shorter-than-expected lives may not benefit from annuitization. Despite these drawbacks, the vast majority of research suggests that retirees overall would benefit from substantially higher rates of annuitization.

## OPTIMAL ALLOCATIONS TO ANNUITIES

Menahem Yaari’s seminal 1965 paper found that, under certain assumptions, retirees should fully annuitize their wealth to maximize lifetime consumption and eliminate longevity risk. Forty years later, Davidoff et al. (2005) showed that even under substantially relaxed conditions full annuitization remains optimal for many consumers, and that annuitizing a large fraction of wealth is optimal even more broadly.

This argument for partial annuitization spurred research focused on a more balanced approach. This line of thinking recognizes that while annuities offer valuable insurance against longevity risk, they also come with potential drawbacks such as lack of liquidity, credit risk of the insurer, and the loss of potential upside from market investments. Many have proposed strategies for allocating a portion of the retirement portfolio to annuities, primarily by either replacing bond allocations or by annuitizing a percentage of one’s portfolio.

1. Pfau (2015) provides further context for this dynamic distinguishing between fettered and unfettered liquidity, a concept he credits to Iowa-based financial planner Curtis Cloke. This categorization highlights that liquidity is often misleading, as many retirees have earmarked large portions of their liquid assets to cover expenses. Using that lens, annuitization requires tying up these fettered assets rather than truly liquid assets.

## ANNUITIES AS BOND REPLACEMENT

Pfau (2015) describes annuities as “actuarial bonds” to highlight that, although annuities provide unique value from the mortality credits they provide, both annuities and bonds provide reliable income streams and reduce portfolio risk. Because each type of product plays a similar role in a retirement portfolio, Pfau and others posit that both are not needed—and that annuities, with their clear advantage, should replace at least most bond investments.

The range of bond-replacement recommendations in the literature is wide, largely due to differing individual circumstances, risk tolerance levels, and the specific types of bonds and annuities being compared. Much of this literature focuses on the *efficient frontier*—the set of portfolio allocations that maximize spending ability for a given reserve of financial assets, or vice versa. The general consensus is that, even in low-interest-rate environments, the efficient frontier consists almost exclusively of combinations of stocks and fixed SPIAs (or SPIA-like instruments).<sup>2</sup> (Babbel et al. 2022; Minches 2018; Pfau 2013, 2023)

Others suggest that annuities should not only replace all bonds in a retirement portfolio; they should also increase the amount allocated to riskier assets. For example, Blanchett and Finke (2018) analyzed optimal equity allocation given the addition of an annuity to a baseline portfolio of 35% stocks and 65% bonds and found that in nearly every instance, the addition of an annuity *increased* the proportion of the portfolio that should be allocated to equities.<sup>3</sup> For a variety of reasons—annuities’ unique provision of mortality credits, the lifetime income guarantee, and a risk profile that differs dramatically from that of bonds (which are now often correlated with equities)—annuities provide retirees greater leverage than bonds to invest in higher-risk-and-return stocks with their remaining assets. (Wang and Warshawsky 2010). A Morningstar study reversed this framing after evaluating a wide range of annuity products, finding that, to achieve the same goals, annuitants *must* invest the non-annuitized portion of their portfolio more aggressively than they otherwise would. (Look and Szapiro 2022)

## ANNUITIES AS A PERCENTAGE OF THE PORTFOLIO

Other research focuses on the optimal size of an allocation to annuities rather than what that allocation should replace, with the current literature suggesting a wide range of allocation sizes. In large part, the variation is due to the extent to which individual preferences and factors such as bequest motives and risk aversion affect optimal allocations.

Based on a review of more than 70 academic studies published between 1999 and 2008, for example, Babbel (2008) concluded that most people should annuitize 40% to 80% of their retirement assets (given pricing at the time). Those with bequest motives or significant aversion to risk should aim for the higher end of that range; those with no bequest motives or lower risk aversion, the lower end.

One of the studies Babbel reviewed, however, gave an even larger range and reversed the relationship between risk and annuitization. That study showed that optimal allocation to annuities (a combination of fixed and variable) ranged from 14% to 66% depending on risk aversion for a retiree with the desire to bequest 20% of their wealth. According to the authors, very risk-averse individuals would be better-served by avoiding annuities because of their bequest motive—they face a significant risk of dying relatively young, thereby failing to maximize the asset-protection value that can be gained from annuitization. (Chen and Milevsky 2003)

Most analyses, however, show demand for annuitization increasing with risk aversion, and one recent study showed that optimal annuitization ranges from 25% to 52% based on risk aversion and wealth level—though wealth in this study was assumed to be between only \$20,000 and \$30,000. (Mills and Anyomi 2022)

Others provide more specific guidance. In a recent study, Nuveen focused specifically on parent company TIAA’s Secure Income Account, a deferred fixed annuity that offers participants the option to convert some or all of their account balance to guaranteed lifetime income payments at retirement. Supporting the argument that annuities should primarily replace bonds in a

2. These studies do find that the portfolios on the very lowest-spending-risk tail of the efficient frontier include small bond allocations.

3. Because of common preferences for stable income and to leave bequests, Blanchett and Finke ultimately suggest a rule of thumb that investors should fund the purchase of annuities using 90% assets from bond investments and 10% assets from equity investments.

portfolio allocation, Nuveen points to Secure Income Account's returns being comparable to a major bond index, making the risk-adjusted returns higher. This study considered five accumulation glidepaths with maximum annuity positions between 30% and 50%, and the modeling suggested that a 40% allocation of the total retirement account is the appropriate target allocation at the time of retirement, though liquidity needs remain an important constraint. (Nuveen 2022)

Regardless of the exact proportion, many studies find that retirees could benefit from gradual annuitization to hedge against both longevity risk and poor investment performance, while still preserving liquidity. (Horneff et al. 2015) Specifically, initial analysis not yet confirmed by modeling from Minches (2018) suggests that retirees should annuitize half of their bond allocations at least ten years from retirement then increase the allocation annually to replace all bonds by retirement. Blanchett (2022) also discusses a dynamic strategy, where the annuity allocation changes with age and overall market conditions.

## ANNUITIZATION BEYOND SPIAS

SPIAs are favorites of economic researchers in large part due to their efficiency, but SPIAs lack flexibility and tie up significant amounts of liquidity. (Ameriks et al. 2001) Additionally, SPIAs do not offer potential for growth in line with the market, which can be a disadvantage in periods of economic prosperity. Moreover, Toland et al. (2018) point out that product rates and specifications can render income annuities less efficient than other guaranteed lifetime income vehicles. Blanchett (2023a) presented similar findings, showing that the high-interest-rate environment of 2022 and 2023 led to payout rates from fixed annuities with guaranteed lifetime withdrawal benefits (GLWBs) that exceed those from SPIAs. This reflects the reality of the contemporary market for annuities: In 2021, traditional SPIAs generated just 3% of the \$313 billion in total annuity sales in the U.S. (LIMRA 2023) Other annuities, designed to address these concerns, comprise the vast majority of the market.

Chen and Milevsky (2003) made the point that using fixed annuities without variable annuities is akin to buying bonds without also buying stocks—one is necessary to complement the risk profile and returns of the other. Variable annuities offer potential for growth as they are linked to the performance of a portfolio of investments

(Horneff et al. 2010; Malhotra 2012). They also offer liquidity and investment downside protection, which can be beneficial in managing market risks (Finke and Pfau 2022).

Blanchett (2021) presents a compelling argument for the inclusion of prepackaged protected wealth strategies, such as Fixed Index Annuities (FIAs) and Registered Index-Linked Annuities (RILAs), in retirement portfolios. FIAs, which protect investors' principal while offering some upside potential, and RILAs, which provide more upside potential while limiting losses, offer a superior balance between growth potential and downside protection compared to traditional fixed annuities or SPIAs. Blanchett's research suggests that these strategies can effectively manage retirement risks, including longevity and market risks.

Others have focused on FIAs with GLWB riders, a combination that can provide richer benefits than other annuities while still keeping assets well-protected, especially if consumers defer withdrawals (Look 2023). Pfau (2023) extends this point further, showing that stocks and FIAs with GLWB riders comprise the entire efficient retirement income frontier and claiming that such structured products provide sufficiently powerful protection to be considered their own asset class. However, Blanchett (2023b) has made the case the "protected lifetime income benefits" (PLIBs)—a product that differs from GLWBs in that the income it provides reflects the returns of the underlying portfolio and can therefore decline over time—are poised to replace GLWBs, which are facing challenging economic headwinds.

In general, the literature suggests that non-SPIA annuity products have the potential to provide a higher level of income in retirement while reducing the risk of depleting retirement savings, underscoring the importance of considering such alternatives when constructing an optimal retirement portfolio.

## QUESTIONS FOR FURTHER RESEARCH

Even after 60 years of research, significant questions remain due to the complexity of the decumulation process, continual advancements in product offerings, and a dynamic market environment. Many of these questions revolve around the optimal timing of both purchasing and beginning to take payments from an annuity. For example, many researchers have pointed out the vital role that annuities can play in helping

retirees delay claiming Social Security benefits (thereby boosting their monthly benefit amount for life). (Koenig et al. 2018; Look and Szapiro 2022; Webb 2009) Conversely, Horneff et al. (2023) suggest that longevity annuities, which begin payments at a later age, can provide a hedge against longevity risk, especially when Social Security benefits are considered. Further work on the optimal role of annuitization considering Social Security and the optimal mix of products with respect to timing of purchases and payments could push the literature toward a more holistic understanding of the decumulation process.

In addition, more work is needed to resolve conflicts in the literature regarding the effect of wealth on optimal annuitization. Some researchers posit that annuitization does not add much value to those who are already well-prepared for retirement. (Look and Szapiro 2022; Maritato et al. 2022) Others claim the opposite: that high levels of annuitization are particularly beneficial for those at the high end of the wealth distribution. (Diamond et al. 2005)

Finally, more research is needed to understand how annuities can provide stability in volatile market environments. Rapidly increasing interest rates following the significant inflation of 2021 and 2022 underscored the importance of stability in retirement planning but also added uncertainty regarding how different types of annuities hold up during volatile periods.

## CONCLUSION

The role of annuities in retirement portfolios is a complex and multifaceted issue, with a wide range of factors influencing the optimal allocation to annuities. This literature review has explored the theoretical benefits of annuities, the optimal composition and size of an allocation to annuities, and the role of different types of annuities.

The research suggests that annuities, with their provision of lifetime income, can play a crucial role in retirement portfolios, helping retirees to meet their spending needs, weather financial shocks, and minimize the risk of running out of money. However, the optimal allocation to annuities can vary widely depending on individual circumstances, risk tolerance, and market conditions.

While this review has provided a comprehensive overview of the current body of research, further research is needed to answer remaining questions and to keep pace with ongoing changes in the annuity market and the broader financial landscape.

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