CANNEX RESEARCH

Funding Your Personal Pension: When Do Contributions into Deferred Income Annuities Before Retirement Make Sense?

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EXECUTIVE SUMMARY

Is there an advantage to funding a retirement income guarantee while still working rather than making a one-time purchase at retirement? Academic research delves into this question in an effort to better understand the influence of certain variables in designing retirement income strategies. This report summarizes a study that CANNEX researchers participated in recently, "Optimal Allocation to Deferred Income Annuities," which was published last year in the *Insurance: Mathematics and Economics* journal.

In practice, many retirement savers wait until retirement to purchase a single premium immediate annuity (SPIA) using a lump sum. Alternatively, there have been unanswered product and policy questions that relate to the pre-retirement purchase of future guaranteed income through one or more contributions into a deferred income annuity (DIA).

This research demonstrates that it is possible for pre-retirement purchases to make sense but that a generic multi-premium predetermined purchasing strategy does not apply to all savers. There are variables that influence a unique purchase strategy of future income with a DIA. Such a solution serves as directional guidance like GPS rather than a single static pathway.

The key factors examined that influence whether a DIA purchase makes sense are:

1. **The features of the DIA design itself;**
2. **Ability and willingness to select and adjust appropriate asset allocation for retirement assets;**
3. **Ratio of savings to existing guaranteed income.**

Even for a one-size-fits-all solution that aims to improve retirement security across a population, these considerations are important in designing a model that balances multiple factors that influence the purchase decision for different employees. Other considerations the paper does not explore include:

1. **Variability of interest rate and mortality improvements;**
2. **Individual longevity risk aversion;**
3. **Uncertainty in future income needs and circumstances in retirement;**
4. **Reluctance to commit a single large sum for a regular payment that is, in relative terms, much smaller.**

BACKGROUND

Guaranteed lifetime income is a cornerstone of retirement security. Pension plans are ever more rare, especially among younger workers. Many American retirees rely on Social Security alone, which may not be sufficient to maintain a desirable lifestyle during retirement. Retirees may purchase retail payout annuities to augment retirement income, though consumers and advisors have not universally embraced this approach, leaving a significant income gap in retirement for many. Therefore, the inclusion of annuities within workplace savings plans is a topic of public policy discussion.

The recent passage of the SECURE Act creates a safe harbor for the selection of annuities in employer retirement plans, removing one of the barriers to adoption of these options. Furthermore, we have seen a number of state-based individual retirement account (IRA) designs consider the use of annuities to enhance retirement income security. As the conversations about worker access to guaranteed lifetime income grow, it is instructive to have frameworks that can guide the use of these solutions.

One common structure uses a target date fund with an annuity allocation replacing some or all of the bond investment. A deferred income annuity (DIA) purchased while saving for retirement can pay a guaranteed stream of income that begins at retirement. There are questions around how to schedule DIA purchases before retirement to build security and whether a one-size-fits-all approach using the chassis of a target date fund is universally applicable to a large population of participants.

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RESEARCH DESIGN

Using mathematical modeling, researchers studied the process of purchasing DIAs before retirement to determine whether it makes sense for workers to purchase future income now or later (in a lump sum or incrementally) within a retirement plan. The annuity purchase can take place at any time up to and including retirement but not after. The research examined:

1. Optimized purchasing of DIA (with varying degrees of death benefit refund) during the deferral period and at retirement;
2. The effect of allowing adjustments to the asset allocation of the investment portfolio in conjunction with the availability of annuity guarantees;
3. The effect of the amount of savings relative to existing guaranteed income to make the decision to acquire additional guaranteed income.

Researchers created a framework to evaluate the appeal of incremental DIA purchases in pre-retirement. The results provide a map, based on the amount of savings and level of guaranteed income already acquired, that shows when it makes sense to purchase a recommended bucket of DIA. This is highly dependent on the type of premium refund that the DIA offers and the ability of the investor to maintain an asset allocation specific to the individual risk tolerance.

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FINDINGS OVERVIEW: THREE KEY FACTORS

1 *Effect of DIA Refundability*

The DIA as modeled in the paper provides a refund that ranges between two extremes: no refund to full refund, which equates to what it would cost to purchase the same amount of income at death. In all cases, there is no death benefit after income begins. Given that the full refund option does not have a retail analog, the research looks not simply at the two extremes but at intermediate points to understand how refundability affects the desirability of an allocation to a DIA before retirement. While this research picks a point that is likely close to annuities available on the retail market, the model itself is flexible and can be calibrated for different product designs.

The less refundable the DIA, the more valuable it becomes in providing guaranteed future income, so the DIA allocation is more attractive. The more refundable the DIA, the more that it serves simply as a fixed income asset alternative in the portfolio. It is important to note again that the fully refundable DIA in this model goes beyond what is typically available in the market, which provides a return of premium that is not adjusted to current pricing in any way, to heirs in the event of death before income.

It is also important to point out that the refundability is directly related to the concept of mortality credits. With mortality credits, the money that would have gone to a policyholder who dies is distributed among those who survive. In this design, a non-refundable DIA takes full advantage of mortality credits.

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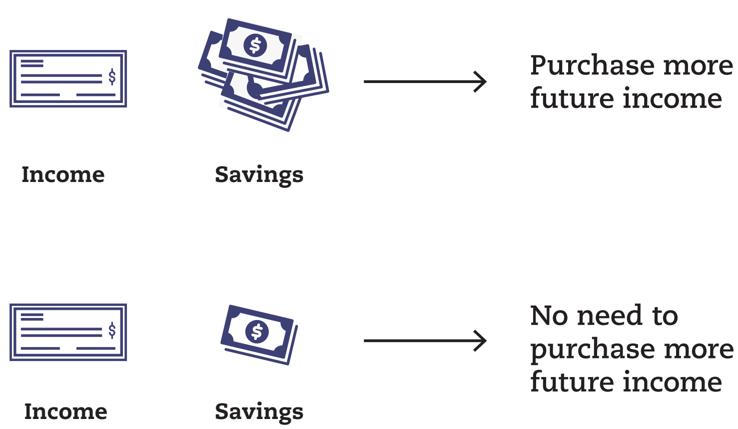
2 *Effect of Allocation Adjustment*

The ability to adjust the allocation of the retirement portfolio affects the appeal of the DIA, particularly when the DIA is most refundable and mimics a bond. In such instances, the key difference between a bond and the DIA is that the DIA purchase is irrevocable, so the worker has no reason to purchase the DIA before retirement; instead, the client can increase the allocation to bonds within the investment portfolio.

However, when the DIA offers more mortality credits and is therefore less refundable, the allocation to DIA may be desirable, depending on the wealth and income level of the individual.

3 *Effect of Savings-to-Income Ratio*

Generally, the decision to allocate to the DIA is dependent on the ratio between savings and guaranteed income. The level of savings must be high enough in proportion to the guaranteed income to make additional purchases of future income desirable, a dynamic that has been previously well demonstrated for single premium immediate annuity (SPIA) purchases. Of course, this factor does not stand alone and the decision point for the DIA purchase changes depending on other factors: availability of investment options and allocations; refundability of the DIA; and time to retirement.



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IMPLICATIONS FOR RETIREMENT PLANS

This research provides insights that can inform the design of workplace savings plans amid a strong push to strengthen retirement security for American workers. There are efforts to increase access to such programs in general and to encourage higher savings rates, but these two measures alone will not be enough to compensate for the loss of pensions. This source of guaranteed income has disappeared as an option for the bulk of workers, but experts laud annuities as a replacement. The SECURE Act's safe harbor for annuity selection creates a concrete framework for product selection that further facilitates the integration of annuities within employer-sponsored plans.

The inclusion of annuities within retirement plans can take many forms. Notably, there are certain plans, particularly state IRAs, that are considering mandating the purchase of DIAs before retirement as workers accumulate savings. The purpose of a pre-retirement allocation is to ensure that workers are generating guaranteed income for retirement to enhance the payments they will receive through Social Security. Furthermore, small purchases over time are less daunting than a single large commitment of savings towards a one-time annuity purchase.

Static Program Design Considerations

Whether a plan pairs an income guarantee with a target date fund or operates a guaranteed income bucket separate from the investment piece, there is a planned glidepath that incrementally builds the amount of guaranteed retirement income. It is reasonable to ask how well this structure meets the needs of the worker.

The research shows us that the initiation of DIA purchases may be earlier or later than what is ideal for an individual worker. Similarly, the investment options may not properly accommodate savings needs. Therefore, many savers will find that they have too little or too much guaranteed income built up through the plan.

A design that allows for a single contribution at retirement is going to capture the greatest number of investors who will benefit from annuitization. Add to this the fact that it is most likely to be beneficial, meaning better than a fixed income investment, within this framework only when the DIA does not include a refund feature.

Investors are able to optimize their income strategies when they have access to DIAs during pre-retirement, but DIAs are more likely to be useful the closer the investors are to retirement. An income annuity purchase makes sense for the greatest number of individuals at the point

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of retirement. This also means that savers must make the commitment to future income using a single lump sum, which is exactly the dynamic that these programs are attempting to overcome.

One element of the SECURE Act that may help is the calculation of future income based on existing plan assets. If savers see the translation of savings into income, they may be more accustomed to thinking in terms of income and therefore less resistant to a lump-sum purchase. This is in line with our own research of consumer attitudes about the usefulness of this information. In the 2020 Guaranteed Lifetime Income Study by Greenwald & Associates and CANNEX, 52% of consumers reported that knowing monthly income in retirement would be most helpful for retirement planning.

Also, some designs assign a bucket of savings to eventual conversion to retirement income. This supports the mindset that a set of assets will be used expressly for that purpose.

The reluctance to convert a lump sum into future income, which we perceive as the problem of annuitization, may not always be dysfunctional. While pre-retirement allocations to a DIA may be the most desirable choice for some investors, the research shows that the reluctance to commit to an income annuity before or even at retirement can in fact be economically rational.

Another practical issue is that the non-refundable DIA design is more likely to make economic sense because it provides the highest value. In practice, consumers greatly prefer refundability; in 2019, fewer than 10% of DIA quotes on the CANNEX income annuity service specified no death benefit.

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Further Considerations Influencing DIA Desirability

While the study examines important variables relevant to the use of DIAs in retirement planning, there are additional considerations that are not part of that research that are worth bearing in mind or serving as the topic of new research.

External Factors

There are additional external variables that can affect the decision to purchase an annuity. Interest rates can be volatile and may change faster or slower depending on prevailing conditions. Furthermore, improvements in mortality can greatly influence both pricing and desirability of an annuity.

Longevity Expectations

This research does not consider differences in longevity expectations among individuals, but it is a worthwhile consideration and perhaps the topic of future research. An individual's perception of their own longevity plays a role in their risk aversion. The only way to enhance longevity protection before retirement is by increasing the allocation to DIA.

Regardless of the overall optimization considerations, the longevity expectations of an individual can outweigh the purchase decision; this research was done under standard longevity expectations, and those who believe they are likely to live much longer will get a higher mortality credit premium out of any income annuity purchase.

Likelihood of Worker Circumstances Changing Before Retirement

One important variable for workers that is not considered within the framework of this analysis is the chance of an individual's circumstances changing before retirement that would alter the desirability of annuity income.

1. Reduction in savings due to expenses such as college, vehicle, medical expenses;
2. Change in marital status or desire to have joint coverage if one is not available by plan design (this is one way in which a pre-purchased solution differs from a pension, where the worker is able to select the most appropriate payout based on then-current circumstances);
3. Change in health that shortens longevity expectations.

Customizing DIA Allocations

As discussed, the research suggests that static solutions are not the best fit to meet the needs of an individual worker. Ideally, a personalized solution is the best means to match the needs of the saver with an allocation strategy that balances investments with annuities.

Full customization requires a complete picture of a worker's financial situation, risk tolerance, and retirement expectations. This information must be updated periodically for accurate allocation advice. This is a significant challenge, even relying heavily on a robo-advice model. Though this type of system would potentially benefit an individual saver, the plan sponsor must provide consistent guidance to support that degree of customization.

The findings of this research can provide guidance on static plan design and considerations that are important in creating rational retirement security for a large proportion of workers. However, plans do not need to rely solely on the construction of a single glidepath to robustly suit the needs of all employees.

Practically speaking, a customized allocation suggestion may work better as an adjunct to a core strategy that incorporates guaranteed income according to a predetermined glidepath. This could serve workers who would benefit from additional annuity purchases or those who already have sufficient guaranteed income and might want to opt out of the core strategy.

Overall, it is important to bear in mind that the research results are sensitive to overall risk aversion, which is very difficult in practical terms to determine and deliver within an employer-sponsored plan, especially as these assets alone may not represent the total savings and guaranteed income for a given worker. Therefore, the use of customization as a one-time correction could be a pragmatic way to increase retirement security of workers, particularly if a plan leaned towards a conservative income allocation.

Retirement plan design is a complex issue with many moving parts. This research provides valuable insight into certain factors that can and should play a role in considerations of plan features. Mathematical modeling can be a powerful tool to facilitate initial plan design and methods for providing surveillance and general guidance.

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ABOUT CANNEX

CANNEX supports the exchange of **pricing information** for annuity and bank products across North America. We provide financial institutions with the ability to evaluate and compare various guarantees associated with retirement savings and retirement income products.

Our **quantitative research** team provides methodologies that help optimize the selection and allocation of annuity and insurance guarantees in support of retirement programs and practices.

Our pricing and analytic services can be deployed to support a variety of processes, including:

- Research & Market Intelligence
- Financial Planning & Education
- Sales & Compliance
- Transaction Processing
- Product Service & Administration

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