

Working Paper

What History Can Teach Us About Building an Optimal Retirement Plan

Gerald W. Buetow, Jr.¹

Anthony Randazzo²

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ABSTRACT

The purpose of this paper is to explore ways to incrementally improve the design of retirement plans. Specifically, we discuss ways to blend the better characteristics of defined benefit plans with those of the defined contribution framework in a manner that has the potential to more optimally balance the needs of the individual plan participant. The blended approach contains periods of traditional wealth maximization that enables the investor to opportunistically capture future income streams throughout their working years. As the income is captured the associated investment liability is also transferred to the income provider. Such a structure would offer participants the benefits of the current DC framework plus the possibility of transitioning into a lifetime income solution as retirement approaches. We also present several means available to employers and the capital markets to facilitate the development of such a product.

¹ President and Founder, BFRC Services, LLC

² Executive Director, Equable Institute and Senior Fellow, Reason Foundation

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I. INTRODUCTION

Retirement investing contributes a vital component to the quality of life of our aging society. It is important in allocating a source of capital for markets and is thus important for economic growth.³ In the context of perpetual concerns about the adequacy of Social Security, retirement investing through complimentary retirement systems is playing an increasingly vital role throughout society. Clearly, it is an important topic.

The current state of the retirement space here in the United States is far from ideal. Defined Contribution (DC) plans have not been structured to holistically address a complete retirement wealth management solution. The deficiencies across the DC space are many, though the foremost shortcomings are ineffective fiduciary oversight and poor investment solutions widely available to participants. Traditional Defined Benefit (DB) plans for most public sector employees are struggling with sustainability, and for multi-employer unions they are struggling to survive. Across the public and private sector, DB plans are slowly transitioning toward DC alternatives and are thus playing a reduced role in offering a long-term viable solution. Even Social Security has some non-trivial headwinds that present material limitations as a retirement solution. While there is debate over the adequacy of Social Security benefits, certainly there is agreement that

³ The importance of retirement investing at the micro level (for individuals) is obvious but it also plays an important role in the allocation of capital throughout the macro economy as well. Within a proper functioning capitalist market, the availability of capital to invest for the long term enhances economic growth and thus improves our society. A self-perpetuating circle of virtuosity can exist as individuals are offered investment solutions that meet their retirement needs which then provides cost effective capital to the capital markets that can be deployed efficiently. This then creates economic growth, more available resources throughout the economy, and optimal investment characteristics and opportunities to the capital markets. The supply and demand of capital provided due to the development of effective retirement wealth solutions is essential for the optimal functioning of a capitalist society.

the very solvency of Social Security is being challenged with elected leaders floating completely irresponsible policies to address it.⁴

Against this backdrop is a growing conversation about how to build a better framework to address retirement solutions. A solution to consider would include the development of a retirement structure that can offer the benefits of current DC plan frameworks, while building in the income-generation solutions and minimum guarantees that DB plans typically offer.

The purpose of this paper is to explore how a blended DC/DB solution that maximizes wealth for a period and then transfers investment liability to the solution provider in exchange for steady income might be developed. We also discuss how such a solution fits into the natural evolution of DC plans and what the challenges are to the emergence of such a product.

Limits of Today's Retirement Market

The closest solution to such lifetime income producing risk transfers that we have at scale today are variable annuities. The major drawbacks to these structures are that they are relatively (and many times absolutely) expensive, they are often inefficient uses of accumulated wealth at their time of purchase, and they can be difficult for the average retirement plan participant to understand (thus limiting effective price-risk trade-off analysis for any given annuity product).⁵

Generally, the typical annuity is inefficient and primarily revenue generating for the provider of them. And yet, in the marketplace today annuities are important as a means of allowing

⁴ In fact, the US Senator from Illinois has stated that retirees receiving Social Security benefits are being greedy in accepting the very benefits they paid for over a lifetime. It's preposterously insulting but speaks to the economic realities of these benefits.

⁵ Moreover, variable annuities are not suited for a retirement framework given their pricing incorporates tax advantages even though within a retirement setting these advantages are redundant and therefore should not be included in the price. See footnote 23 for the government study purporting the impending insolvency of Social Security.

individuals some kind of guaranteed income stream. As such, annuity products have their place, but they often are more about giving customers peace of mind than maximizing their retirement savings.

Guaranteed minimum withdrawal benefit (GMWB) plans offer a flexible form of income in retirement, and if the fees on such products were to decline, they might be an effective tool for some individuals to shift a portion of their retirement savings into as they end their working years. But even if such products were affordable and cost-effective at scale (which today they are not), they still would require a participant to effectively manage their retirement savings throughout the accumulation stage of their life. As we present below, current DC frameworks rarely allow individuals to maximize their potential in such an endeavor.

Meanwhile, pension plans are on the decline. The guaranteed income provided by liability driven retirement solutions (such as pensions based on final average salary) are increasingly becoming obsolete because of their costs in a low interest rate environment. The trend is certainly away from DB structures and toward DC plans.⁶

Structuring a retirement plan that better meets the needs of individuals requires a blended approach that combines some of the characteristics of both DB and DC plans. However, the current state of the DC space doesn't adequately address the demand of a reliable income stream. As stated earlier the current state of the annuity space is just not cost effective, is not designed to reside in a retirement plan, and is designed almost exclusively to generate a

⁶ For more specific details, see Keith Brainard and Alex Brown, "Significant Reforms to State Retirement Systems" *National Association of State Retirement Administrators*, <https://www.nasra.org/files/Spotlight/Significant%20Reforms.pdf>

significant spread product for the providers. What is needed is a series of solutions that enables the investor to transition from a DC like structure into a DB like structure over the investing period of the plan.

The retirement solution we propose here would have the income requirements of the “decumulation phase” be addressed throughout the wealth “accumulation phase.” The investment cycle would simultaneously incorporate both aspects of the retirement wealth solution. This cycle may include opportunistic periods, dovetail periods, discrete periods and eventual transition periods. In other words, the needs of the retirement wealth management process would not be distinct periods. We believe that is what drives much of how current retirement solutions are conceptualized and is a reason why they are inadequate in addressing the holistic issues facing the retirement space.

As the retirement solution transitions assets, the investment liability would also need to transfer. That is, the investment liability of the income stream must be transferred to the solution provider increases. Without the associated risk the provider has no incentive to properly manage how the income is generated. This transference doesn't necessarily have to be monotonic through time but can be opportunistic and event driven.

The cost of this liability transfer must be far more cost effective than anything that is offered currently and must be offered by providers with economies of scale in order to be able to accept the risk and produce the income. A liability driven investment (LDI) solution provider with scale to come along will likely be necessary. Possible ways to fund this cost transference would be for employers to subsidize the offering as a benefit to employees. In the current interest rate

environment this seems likely. Below we introduce other employer-based mechanisms available that would facilitate the production of this type of investment vehicle.

Extant Literature

Other studies have addressed the need for this type of investment structure within the DC universe. Mitchell (2016) and Sexauer and Siegel (2017) presents the relationship between income needs of the aging population and the lack of savings to support the challenges this dynamic poses. Campbell and Weinberg (2015) examine the extent to which Americans are financially prepared for retirement and also express concerns between the income needs and savings rates of the population. Consiglio, Tumminello, and Zenios (2015) raise the need for some kind of income guarantee to address the issue of income verse savings needs during retirement. Pfau, Tomlinson, and Vernon (2017) present the need for annuity like products being a mainstay on DC investment menus. Waring and Siegel (2007) and Szapiro (2016) also recommend the need for income generating products such as annuities are needed within the DC space.⁷

Outlining the Missing Retirement Solution

A blended DC/DB would aim to package the best elements of LDI-style defined benefit plans within the framework of DC retirement plans. Our proposed blended structure would be designed with the beneficiary/participant in mind, and not the solution provider. Effective fiduciary oversight and low fees would be at the heart of this approach. But also, management tools such as using common language questionnaires to derive the appropriate risk-weights and

⁷ Popular press type of articles include Ali (2018), Kahn and Rafaloff (2009), Ameriks and Yakoboski (2003). More formal studies on this subject include Abraham and Harris (2016), Asness and Ilmanen (2012), and MacDonald, Morrison, and Hardy (2013)

trade-offs necessary to manage the solution, making it easy for the participant. Pairing the process with algorithm based financial technology will facilitate the process as well.

The idea is to design a structure specifically priced for a retirement product and all redundancies priced out of the investment solution. A major limitation within the capital markets as they currently operate is that investment solutions are designed to generate revenue for the larger providers and not to offer optimal investment characteristics to the individual investor. We believe that all parties can benefit with the proper design of this type of investment vehicle. Most importantly, our society would benefit materially.

II. A SUMMARY OF TRADE-OFFS WITH COMMON RETIREMENT PLAN DESIGNS

Broadly, retirement solutions can be broken into two categories. Category one is some form of a DC structure, such as 401k and 403b plans. Category two is some form of a DB plan, usually a final average salary-style pension. These solutions can come in the form primary retirement income or supplementary income plans, and they can take on a whole host of features and cost structures. But removing the technicalities, the critical differentiating factor in any retirement solution is how investment risks are distributed.

The standard DC plan design puts investment return risk exclusively with the plan participant (individual investor) who has complete discretion of how contributions are allocated across investment solutions through time.⁸ Alternative DC designs can shift some of the risk to

⁸ Theoretically, the DC plan sponsor (employer) fulfills their fiduciary role expertly and thus provides a menu of investment solutions that can be structured by each plan participant to amass enough wealth over their working years to then be able to retire comfortably. The traditional way to evaluate this framework is to use single period wealth maximization approaches under a set of assumptions. The plan participant is then expected to implement the output across the appropriate solutions. Presumably this approach results in a multi-asset class solution that meets the needs the investment preferences of each individual plan participant.

institutions through deferred annuity type products that accepts the tradeoff of a reduced upside on investment returns. And plan sponsors can offer the option of professionally managed funds. But on the whole, DC plan frameworks effectively assume that the plan participant is an investment expert — and this is perhaps the most significant weakness in how DC plans operate.⁹ Participants in DC plans can turn their accumulated wealth into retirement income upon reaching a retirement age, but are left to determine the most effective means of acquiring this stream of income. Moreover, if a DC plan is structured poorly, a DC plan participant can easily find themselves facing retirement with insufficient wealth due to poor investment decision making. This is an issue for plans with poor investment solutions or plans with little fiduciary oversight enabling plan participants to select improper investments.

Defined benefit plans operate quite differently than DC plans. Retirement income streams are determined ahead of time by formula, and this liability is a metric against which institutional investors manage funds. Commonly, for every year of service, a participant will receive some percentage (plus an inflation adjustment) of their salary as income post retirement. The eventual income stream is then a function of years of service and an average salary figure computed toward the end of service. The value of this income stream at any time is inversely related to the general level of interest rates and mortality rate assumptions. In DB plans, the direct risk of the investment solution is placed on the DB plan provider (such as a private employer or public entity). However, while DB plans usually are often presented as an annuity structure, there can be significant risk to plan participants.¹⁰ Participants face underfunding risks associated with

⁹ Benartzi and Thaler (2001) and Choi (2015) both imply that plan participants are often not sophisticated enough to implement portfolio construction optimally.

¹⁰ See Poterba et. al. (2007)

accounting manipulation, policy changes, and political ineptitude, such as active employees being asked to contribute more into the fund and beneficiaries may see adjustments to their inflation protection. Where legal protections do not otherwise exist, participants may also see changing parameters (annual benefit multiplier rate, retirement eligibility terms, etc.).

So, while the simple fixed annuity stream at retirement associated with DB plans clearly is attractive, it is in no way free of risk. In a DC plan the entire investment liability lies with the plan participant and within a DB plan the investment liability lies with the DB provider but the participant still faces the aforementioned potential risks.¹¹

Moreover, there are key portability trade-offs between the DB and DC designs. Generally, DC plans offer far more portability of employer contributions and investment returns than DB plans can offer. Once the vesting period is satisfied DC plans can be ported with the individual as they transition throughout their career. This facility is tremendously valuable to the individual as it allows them to pursue career objectives without sacrificing retirement wealth accumulation. DB plans do not normally allow (or greatly inhibit) for this portability and often individuals may have to sacrifice accumulated DB benefits upon transitioning to new career opportunities, taking back only their own contributions, perhaps with nominal interest. This reduces the number of individuals who are on an adequate path to retirement security and in some cases can hinder career enhancement, potential professional development, and optimal economic growth.

¹¹ Theoretically, in a world where default risk is negligible the plan beneficiaries do not face any investment risk within a DB plan framework. In such a world, risk averse individuals generally prefer a DB like structure where income generation post retirement allows for them to plan a sustainable quality of life in retirement. Unfortunately, most DB plan entities are not default free and subsequently funding for the DB plan is often problematic regardless of whether the plan is private or public. Even Social Security suffers from this issue. Apparently, elected leaders simply do not understand the consequences of profligate spending financed by debt.

The Limits of DB v. DC Comparisons

While comparisons of the plan design features of DB and DC plans can be helpful in thinking through their pros, cons, and trade-offs, a direct comparison of the efficacy of one design concept over the other is usually unhelpful. The typical income comparison between DB verse DC structures are almost completely dependent on the assumptions made to make the comparison. Not surprisingly, the conclusions of such comparisons are therefore largely useless as they are largely inconclusive.¹² The DC plan used in these studies typically starts with asset class return distributions and simulate accumulated wealth which is then compared to the present value of a DB income stream. Clearly, the accumulated wealth is no more than compounding growth exercise which is simply an extension of the return distribution assumptions. Similarly, the present value of the DB income stream is purely a result of discount rates, participation levels, and mortality assumptions.¹³ It is straightforward and intuitive to understand how the results would be impacted.

¹² For example, a sound methodological paper from Munnell, Aubry, and Crawford (2015) contrasts the effective returns from DC and DB plans and conclude that DB plans slightly outperformed DC plans over the 1990-2012 period mostly due to higher fees throughout the DC universe. However, just slight tweaks to the fees charged, contribution rates, or DB designs could change the results significantly. The historic comparison in the paper is helpful insofar as measuring plans in the past to say something about those plans at that time, but it is not necessarily a definitive statement about how to interpret generalized DB or DC plans prospectively.

¹³ Also worthy of noting is that the DB plan analysis almost always ignores the corresponding risks mentioned above. The understatement of this risk invariably exaggerates the present value of the income stream thus biasing the results toward the DB structure [Poterba et al. (2007)]. The risk would negatively impact the income cash flows and positively impact the discount rates. Both will have a negative impact on the resulting present value computation.

Key Retirement Solution Features to Blend Together

Surveys of public sector workers provide clear evidence that a treasured feature of the defined benefit pension is the guarantee associated with retirement income.¹⁴ And why wouldn't they? Any individual planning for retirement would value having some source of fixed income where they held limited investment risk during accumulation and zero risks of running out of money during decumulation. It isn't hard to see why the retirement solution of the future should build in some source of guaranteed income. This survey seems to confirm the traditional assumption that as retirement approaches risk aversion increases and thus the preference for income and capital preservation do as well.

Portability of retirement benefits, is another key feature that should be built into a blended DC/DB. In particular, the portability of employer contributions to a retirement plan. Not to mention the flexibility for individual accounts to shift between employers as plan sponsors (critical to align with current workforce trends). Of course, a key trade-off between DB and DC designs is the tension between the cost structure required to provide a guarantee and the design limits necessitated by having maximum portability and flexibility.

And perhaps most important of all, the blended DC/DB must incorporate all of the lessons learned over the past several decades of DC plan management to ensure appropriate fiduciary behavior, asset allocation decision making, and participant engagement.

¹⁴ See "What Younger Public Workers Think About Retirement" from The Pew Charitable Trusts, available at <https://www.pewtrusts.org/en/research-and-analysis/articles/2017/05/22/what-younger-public-workers-think-about-retirement>

III. THE NEXT ERA IN THE HISTORY OF DC PLANS

DC plan structuring has historically not been particularly optimal. Often, DC plans were not designed to enable the plan participant the opportunity to create an optimal strategic asset allocation.¹⁵ This is slowly changing as fiduciaries are being more properly held account for their poor decisions and plan participants are seeking retribution through litigation. As this dynamic plays out DC plan design will get more efficient and structuring and investment solution selection will become more in favor of plan participants. Fiduciaries will be expected to build investment solutions that offer plan participants optimal performing exposures to a myriad of asset classes; they must ensure that these solutions are properly monitored and held to account to ensure that plan participants are always at the fore of all DC plan decision making. This has not been the case historically. Some fiduciaries would offer insufficient exposures or literally hundreds of investment alternatives¹⁶; both cases make it extraordinarily difficult to impossible for the plan participant to construct an optimal wealth solution.

The Emergence of QDIAs and TDFs

As fiduciaries began to recognize their liability to improper DC design, they began to offer qualified default investment alternatives (QDIA) to mitigate their exposure and fulfill perceived regulatory requirements. Eventually, fiduciaries evolved to a point where they recognized that a

¹⁵ Vernon, Pfau, Reish, Ashton, and Waldbeser (2013) have a nice review of the issues facing both fiduciaries and plan participants.

¹⁶ Fiduciaries too often pick far too many investment alternatives or attempt to select active managers for each asset class. The selection and monitoring of active managers is far too difficult for most fiduciaries. See Buetow and Hanke (2019) which presents a current study regarding this problem.

solution that offered proper asset allocation and attempted to address the deficiencies of a single period framework began offering target date funds (TDF).

TDFs are multi-asset class solutions that transition expected risk and return exposure as the investment horizon gets shorter (as retirement gets closer). This is to simulate the need to alter the asset allocation from primarily equity (long term horizon, younger employee that has a retirement date that is far away) to mostly fixed income for income generation (so ideally, as retirement approaches the fixed income portfolio will be adequate to generate necessary income in retirement). This transition graph is commonly referred to as a glide path. A typical glide path and allocations as a function of target date are presented in Exhibits 1 and 2.

Limits of TDFs as the Retirement Solution of the Future

TDFs are an improvement over what has historically been available throughout the DC space. However, they are a one size fits all solution and offer no assurance that the wealth accumulation or the income generation will be sufficient for the plan participant during retirement. Moreover, the asset allocation assumptions made by most TDF are based on a similar set of assumptions that are usually heavily dependent on historical performance. There is a group think conforming aspect to them and thus they are generally the result of a single period optimization approach.

A vast literature exists regarding TDF as investment alternatives with the DC space; most popular press or blog type coverage tends to be opinion written by financial advisors resentful that the TDF has largely removed them from the investment process for individuals, thus denying them an opportunity to charge fees. Other coverage can effectively be marketing by TDF providers hinting at why investors should use their TDF not others, or by insurance entities pushing annuity

like products in lieu of or adjacent to TDFs. Usually, the source of TDF coverage needs to be understood in order to properly interpret an article about TDFs. Once motives are properly known then any bias can be more easily identified and removed for optimal interpretation.

TDFs within a DC plan has received plenty of attention throughout the literature. Tang and Lin (2015) focus on glide paths and how they not surprisingly drive investment characteristics. Estrada (2014) interestingly suggests that the glide paths should be positively sloped as a function of capital appreciation; this is hard to square with most acceptable wealth management techniques.¹⁷ Pang and Warshawsky (2011) runs simulations to contrast TDF with balanced funds and unsurprisingly concludes that the glide path plays an important role in determining the differences in the investment characteristics between the two. Dhillon, Ilmanen and Liew (2016) suggest that traditional TD can improve diversification by using more sophisticated investment vehicles. Fisch and Turner (2018) present some ways to improve TDF by offering more customization at the investor level by leveraging the use of financial technology.

The Classic DC Plan Asset Allocation and Risk Aversion

A typical strategic asset allocation framework that is used in the DC framework starts with an acceptable set of asset classes, corresponding return distributions and an investment period. The optimal asset allocation that results typically maximizes expected return for each given level of expected risk. Expected return maximization is equivalent to expected wealth maximization in the context of the framework.¹⁸ Depending on the assumed return distributions of the asset

¹⁷ This result does have some credence if historical returns are the primary source of the investment analysis. See Perry and Randazzo (2019) for similar findings.

¹⁸ There will be a distribution of terminal wealth expectations around a mean. The spectrum will depend on the second moments of the return distributions for the asset classes.

classes we generally expect to have higher exposures to equity to generate more wealth over longer term investment horizons. This is the framework within which TDF are structured and can be seen in Exhibits 1 and 2. Interestingly, it can be shown using historical results the investor is almost always better off with an aggressive portfolio (i.e., equity) over most investment horizons (see Perry and Randazzo (2019)). The idea that portfolios *should* transition to fixed income as the investment horizon shortens doesn't seem to hold up empirically when depending largely on historical results. It seems that the transition to fixed income is suboptimal for most investors. At least, when the objective is to maximize expected returns.

A driving factor that leads TDF asset allocations to shift towards fixed income in the later years of a fund period is a risk aversion preference of individuals who are investing in the funds. Another key factor is the lack of a prevalence of simple and cost-efficient ways to turn accumulated wealth into income. Risk aversion is not always rational (in the traditional economic sense) and so the perception of capital preservation and income generation may have an overwhelming influence on investor decisions, and thus investment product design. Peace of mind can have more value to the investor than is typically captured in return distributions or utility maximization functions.

If investors had the ability to more readily and efficiently transfer wealth into lifetime income structures the optimization results described above might be quite different and asset allocation toward a blended structure might result.

IV. WHAT AN LDI-STYLE “BLENDED” RETIREMENT SOLUTION COULD LOOK LIKE

Abstracting from the practical constraints, what would this solution look like? Traditional DC plans are designed almost exclusively to maximize wealth with the presumption that upon retirement enough wealth has been created to produce income for the life of the investor. The income generation is generally created as a combination of income generating assets and some capital depletion. During fixed income friendly environments, the income generation can occur with far less capital depletion; of course, the reverse is also true. A very important unknown in this dynamic is the variability of the investment horizon of the investor. That is, how long does the income have to last? Regardless of the answer most investors would prefer to preserve as much capital as possible throughout retirement. The best effort to try and address this within the current DC space is probably through a TDF or inefficient variable annuities. As we have presented above these are not optimal.

Our solution aims to minimally keep the elements of the DC framework that are desirable, while blending in the best elements of DB plans:

- Participants will not have to make major investment decisions if they do not possess the investment acumen to do so (a benefit of DB plans where funds are managed professionally), being defaulted into optimal investment solutions that balance the goals of wealth accumulation and the needs of the decumulation phase that includes some meaningful guaranteed income. This would be facilitated by leveraging financial technology;

- All earned retirement savings and earned income would be fully portable for participants across employers (a benefit of DC plans);
- Guaranteed lifetime income contingent upon years and/or quality of service thus ensuring a relationship between employee and employer. So this component of the investment solution, which is a DB like characteristic, could be obtained through a variety of ways;
- Plan sponsor costs would be known and manageable (a benefit of DC plans).

Ideally, participants would accumulate a certain amount of minimum guaranteed lifetime income over the course of their retirement saving accumulation years, with an investment portfolio mix seeking to maximize an income replacement rate rather than simple wealth maximization. Increasing that guaranteed income could also be contingent on quality of service or length of service rewards. In other words, the income would be a function of a variety of thresholds that enable a balance between employee and employer needs. This would be accomplished in a variety of ways as outlined below. This is a DB characteristic but an important one. By tying longevity and quality of service to income generation the employer has a framework to motivate the employee and the employee knows that the income is portable so never feels trapped in a situation due to retirement benefits.

To accomplish this the participant would have to identify certain trade-offs, such as how much risk they'd want to take to accomplish a given income replacement target and what minimum level of guaranteed income they'd want to accomplish. The feasibility of the income target would clearly be part of this analysis. Our participant focused solution would necessarily need to be led by an advisor/provider created tool (i.e. some form of fintech rather than the less scalable

individual advisor conversation) for working through these questions, using easily accessible language and concepts. The output should be the participant investor having determined an appropriate level income necessary to sustain a reasonable lifestyle during retirement, combined with some measure of risk appetite.¹⁹ This income target would incorporate alternative sources of income like Social Security and non-retirement investments as well as an appropriate accounting of costs.²⁰

Providers of our blended solutions would offer a menu of products with varying monthly income levels, start dates (post retirement), and effective terminal dates (effective maturity of each product from start date) to select from. Each solution could be purchased either from an in-kind transfer of DC assets or committing a stream of future DC contributions over a specified period. Ideally, these products do not *need* to be selected by the participant — many individuals do not feel comfortable or equipped to make such decisions — but rather by algorithmically determined using the participant goals and risk appetite and monitored/reviewed by professional fund managers.²¹

The solution provider can offer these solutions in a cost-effective manner by comingling across large pools of investors and diversifying risks. The structures can offer a sort of hybrid mix of capital appreciation and depletion depending on the target income level. The price of these

¹⁹ For most individuals, such a target could also be automated based on a few simple questions, inputs from the plan sponsor (such as anticipated income paths for individuals in various categories), and assumptions such that the plan participant does not have to commit too much time or energy.

²⁰ As a practical concern, one of the biggest challenges for plan providers is the lack of information about what exists outside the plan. However, technology-based solutions to solve for this practical problem are already taking shape and being executed, such as the way certain robo-advisors (Betterment, Wealthfront, etc.) are linking out to other financial services firms to account for assets held in other plans, banks, and portfolios.

²¹ For example, when setting up the account a few questions could be asked that would allow an algorithm to determine a risk tolerance score. This score could determine not just an asset allocation (the way robo-advisors do), but also how opportunistic the portfolio could be in moving to grab income products and when.

solutions will vary with the capital market environment as interest rates and economic growth influence the risk management capabilities of the provider.

Features that Could be Included

Employers could subsidize the cost of such products through time as part of a compensation package thus helping enhance the cost efficiency of these products. A variation may even include incremental income solutions paid for by employers as part of a total compensation package. For example, after 5 years of service the employer contributes enough capital to the solution provider to produce a percentage of current salary at retirement for a specified period. This benefit could increase at various stages of service or as a reward for any of a variety of reasons. Employees could be given the opportunity to take their bonus as a combination of this incremental solution (which would also presumably be tax free) and cash. The difference between this and a traditional DB plan is that once this product is purchased in the name of the investor/participant's name, it is completely portable. This balances the incentive for employers to retain employees with the portability normally associated with DC plans.

With these tranches offered through time the idea would be for participants to accumulate enough income at the time of retirement to meet their lifestyle needs for appropriate lengths of time. At retirement, these products would also have a secondary market value based on their present values that could be liquidated by the investor if needed. Ideally, this could be done free of taxes.

V. Practical Realities

Many of the problems within the DC space emanate from incompetent fiduciaries who have constructed plans that consist of some combination of either poorly managed funds, no asset class selection consideration, or no infrastructure to properly monitor funds (among others).²² This has evolved for the most part because a DC plan places all discretionary responsibility on the individual investor. In other words, the space evolved effectively with the perspective that once plan sponsors select the investment offering it's not their problem what happens in the end.²³

Of course, there would still be limits to the current DC landscape even if fiduciaries were faultless in their methods and plan participants were investment experts. Under the structuring requirements of a DC plan, success or failure for even the rare DC plan that is designed and monitored perfectly depends on the investment decisions of the participant. QDIAs have helped to mute some of the problems created by poor participant decision making, and thus have become a tremendously important aspect of the investment decision making dynamic. TDFs as the default QDIA for more and more plans have been a move in the right direction but for reasons presented above are not a complete solution.

A possible limit with our proposed blended DC/DB is thus that it may be prone to both similar fiduciary errors and may not be a complete solution for the problem of the lack of participant investment knowledge or experience. This requires more participant investment education. The ability of the DC fiduciary to properly communicate and educate participants has always been a

²² Again, see Buetow and Hanke (2019).

²³ This is changing slowly via lawsuits but even then, the basic DC plan structuring needs impactful solutions. More on the difficulty of the fiduciary can be found in the appendices.

challenge for DCPs. We believe, as expounded on above, that an approach that leverages financial technology with traditional methods in an aggressive manner can enhance this process greatly. Plan participants must be motivated to better understand the benefits to them more clearly. They have the discretion and thus the decision-making authority over their retirement. If fiduciaries act with a higher sense of urgency in educating and communicating these solutions, then the participants will be more optimally served. If the retirement solution conceptualized in this paper is an improvement over historically suboptimal plan design, it may still be lacking in its inability to meet the needs of the plan participant. User error will always be a risk. However, having a cost-effective income generating solution available to plan participants would be a tremendous contribution to the DC framework.

An effort to transition typical DC frameworks into an LDI/DB type structure would better serve retirees. However, it runs the risk of simply resetting the retirement investment planning process back to the genesis of the DC to begin with. The ability to shift liability onto investment professionals and removing the need for the average participant to make decisions is an important feature. A key difference here is that the employer is not liable like in a DB plan. The investment decision making and corresponding risk is being shifted to a third party provider who is being compensated. The primary limit to such a development now is the cost of taking on such liabilities by the solution provider.

The cost to transfer the liability risk of success/failure will be expensive even when capital markets offer an environment where income and capital preservation are plausible. Monetary policy has perverted the fixed income markets for possibly generations to come and has created

an extremely high cost for income.²⁴ In this environment the only way to generate enough income is by exposing wealth to high risk (leverage or default risk). Clearly, this is unacceptable for the purposes within a DC plan. Paradoxically, if the wealth accumulation is large enough, subsequent income generation is less challenging but simultaneously less needed (which is implied in the current findings in the technical piece). The tradeoff between these forces (cost, term structure, risk preferences, risk shifting, etc.) must be thoroughly investigated and understood.

VI. CONCLUSION

Ultimately the problem is about the cost of accepting the liability of the income stream. In the private sector this a problem to be overcome to improve the quality of retirement outcomes as a component of a better society. The public sector, this is a problem to be solved in earnest as more DC frameworks become more prevalent.²⁵

But who pays for it in a capital market where fixed income products are just too expensive, and the risk management of a DB style product is just too expensive to be realistic? Our blended DC/DB product with the cost of the structure is shared seems like a starting point for a better outcome. Most employees most assuredly would rather not have their retirement income contingent on the caprice of public sector funding or decision making.

²⁴ Monetary policy mistakes over the past decade were short sighted. They seem to have entered a kind of Faustian bargain. Generations of investment solutions are going to be negatively impacted.

²⁵ Public sector decision makers will be motivated to transfer investment risks and the cost of the liability of a guaranteed income stream to the employee. The employee wants a DB like structure for all the risk aversion reasons outlined above. We think the next generation of public employees, with the Great Recession resonating, will want a DB structure as well.

As DB plans continue to transition to DC type plans perhaps using the surplus from the long equity bull market to subsidize the blended solution makes sense as well. Effectively what DB providers are doing is buying out the plans due to large surpluses in order to transfer the investment liability onto the employee. A possible alternative in our proposed framework would be to use the entire DB account to fund a third-party provider to structure our solution.

Our efforts are to build a conversation around this kind of solution so that the investment industry will begin to formulate strategies that are marginally profitable but more importantly in the best interest in our society and the communities in which we all live. As DB plans continue to transition to DC type plans perhaps using the surplus from the long equity bull market to subsidize the blended solution makes sense as well. Effectively what DB providers are doing is buying out the plans due to large surpluses in order to transfer the investment liability onto the employee. A possible alternative in our proposed framework would be to use the entire DB account to fund a third-party provider to structure our solution.

Recent forecasts include the insolvency of Social Security by the year 2035.²⁶ Like most predictions this may prove grossly inaccurate, but it still highlights the importance of supplementary retirement plans that most wage earners will rely on in the coming decades. Most prevalent among these in the DC plan. We have introduced a blended investment alternative to advance the conversation around combining ideas into a possible solution to many of the limitations regarding the current DC structure. Our solution attempts to stand on the shoulders of other researchers to construct an implementable solution. We believe that such a solution will

²⁶ See the report from the Trustees, Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds at www.ssa.gov/oact/TR/2019/tr2019.pdf.

enhance the opportunity sets of individuals, investment solution providers, the economy, and our entire society.

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Exhibit 1

Transition Path as a Function of Maturity Portfolio

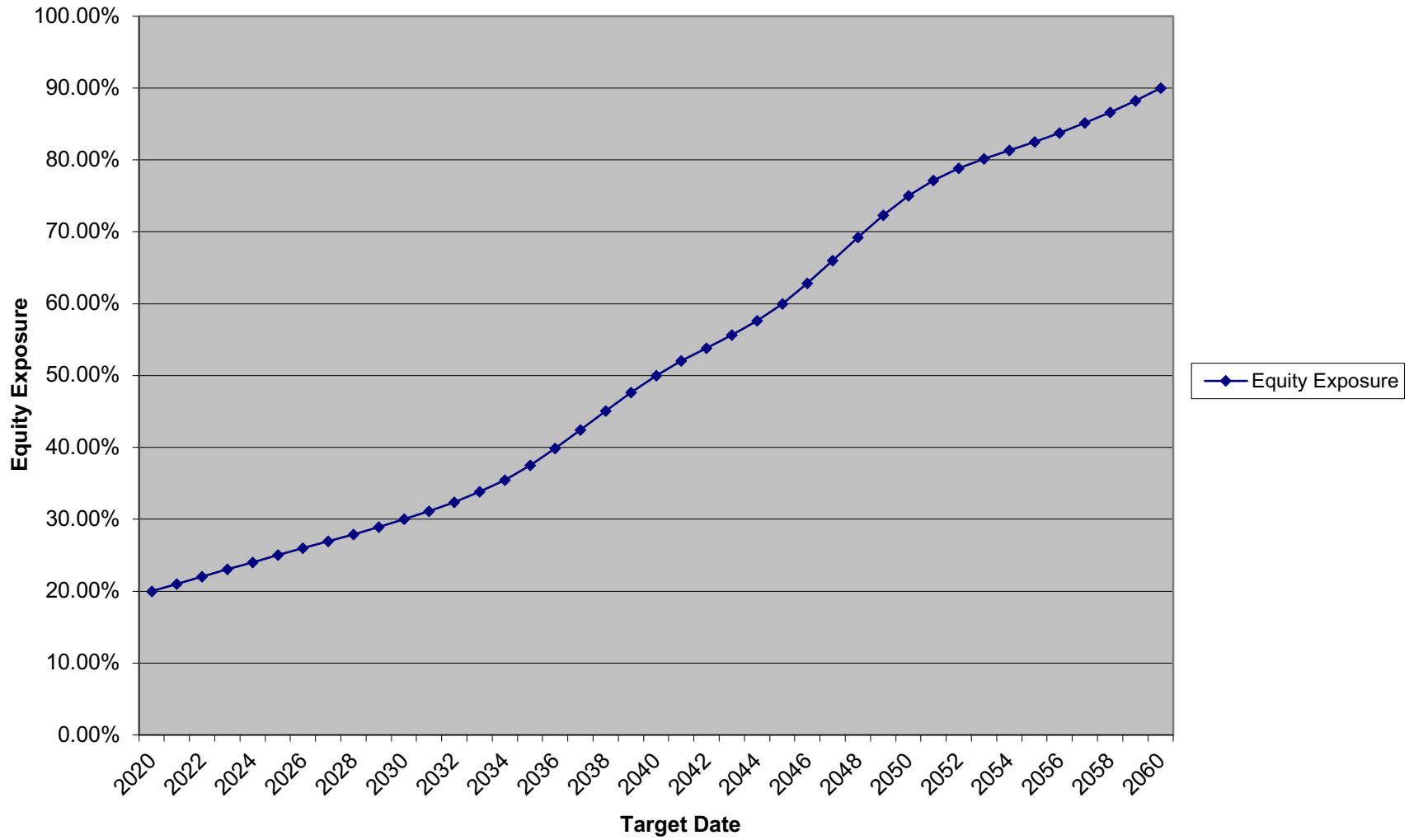


Exhibit 2

Allocations by Maturity Portfolio

