

# FUNDING RETIREMENT:

## *next generation design*

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Nobel Laureate Professor Robert Merton was the keynote speaker at a recent superannuation conference held by Finsia (in collaboration with the Institute of Global Finance at the University of New South Wales) to discuss solutions for meeting the challenge of global retirement funding. This is an edited version of his presentation.

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*Funding retirement is a growing challenge and it is a global one. Even in countries such as Australia, which embraced defined contribution plans two decades ago, there are questions about the adequacy of individual savings.*

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Due to excessive complexity in investment choices and a focus on the wrong goals, hundreds of millions of low- to middle-income earners face a precipitous decline in their living standards upon their departure from the workforce.

But it doesn't have to be that way. Technology, innovation and our understanding of what are meaningful choices about retirement funding mean we are now in a position to design a better system that serves all people, not just the wealthiest ones.

My own extensive study in this area tells me that the goals of efficiency, rigour, strong governance, simplicity, engagement, customisation and adequacy of outcomes should not be incompatible or mutually exclusive in any retirement savings system.

The task of building a new-generation system starts with properly defining the goals. So in this paper I go back to first principles, put aside existing assumptions and ask 'if you were designing a retirement savings system today, what would you do?'

### **A better design**

The use of defined-contribution (DC) plans has become the default strategy in Australia since the introduction of compulsory superannuation two decades ago. In the United States and Europe, the embrace of DC has been more recent.

While defined-benefit (DB) plans provided a level of certainty for employees about income in retirement, they are unsustainable and unaffordable for their sponsors.

DC solves the problem for trustees by making costs predictable and by taking risk off the plan-sponsor's balance sheet. But it burdens users with having to make complex decisions about issues in which they

have zero expertise. For many, particularly those for whom retirement is a long way away, the temptation is to conclude that it's all too hard.

So, in considering how to reshape this system, we should start by establishing the goal.

What are members seeking to achieve? Well, for most people, it's fairly simple. They want an inflation-adjusted level of funding that allows them to sustain the standard of living in retirement that they have grown accustomed to in the final years of their working lives.

How do we define a standard of living in financial terms? The traditional assumption might be the nomination of a sufficiently large lump sum. Indeed, that is the premise of most DC plans, including most in the Australian superannuation system. The focus is on amassing a sufficiently large lump sum in the accumulation phase.

But in reality, when talking about a standard of living, people think of income. For example, the aged pension benefit is described in terms of an annual payment and not in terms of the present value of those payments. Similarly, a DB plan benefit is expressed as income per year for life and not by its lump-sum value. The same story holds for an insurance company life annuity.

While the mores of Regency era England are a world away from those of today, forgive me if I use an illustration from Jane Austen's *Pride and Prejudice*. In this classic novel, Mr Darcy is judged an economically worthy catch not on account of his total accumulated wealth but because he is 'worth £10,000 a year'. In other words, the standard of living he could provide is defined by his cash flow, not his cash pile.

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Essentially, this is why a defined-benefit type of payout is so attractive. We know the income we will receive, there are no complex decisions about asset allocation or investment strategy, and the risk is on someone else's balance sheet. Unfortunately, DB plans are neither affordable nor sustainable. We have already decided that.

On the other hand, does it make sense to ask a 30-year-old to make decisions on an appropriate asset allocation today that will deliver them an adequate income 35 years from now? Does it make sense to ask individuals how much emerging-market exposure they want or what level of maturity risk they desire in their fixed-income allocation?

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As well as this unnecessary complexity, most DC plan allocations take no account of individual circumstances, including human capital, housing and retirement-dedicated assets held outside the DC plan. Those are all important inputs for an allocation decision customised to the needs of each person.

So if we are to design a next-generation retirement solution, there are a few requirements we need to meet:

- First, we need robust, scalable, low-cost investment strategies that make efficient use of all dedicated retirement assets to maximise the chance of achieving the retirement income goal and manage the risk of not achieving it.
- Second, we need a risk-managed customised solution with individually tailored goals for each member — taking into account his or her age, salary, gender, accumulation plan and other assets dedicated to retirement.

- Third, we need a solution that is effective even for individuals who never provide information or who never become involved in the decision-making process at all. And, for those who do become engaged, we need a solution that gives them meaningful information about how they are travelling and what they can do if they are not on track to achieve their retirement income goals.
- Last, we need a solution that allows plan sponsors (or pension fund trustees) to control their costs and eliminate balance sheet risk.

Traditionally, DB plans served some of these needs. But these plans were unsustainable, as their cost was greatly underestimated. In more recent years, those problems have become exacerbated by longer life spans, falling interest rates and increasing volatility in financial markets.

What I have in mind, then, is a DC plan that satisfies the goals of sponsors/trustees, while providing the attractive outcomes for members of DB plans, which do such a good job of meeting the needs of retirees.

Yes, users should be given choices. But those choices should be ones that are meaningful to them, not the choices that are typically given today, such as what mixture of equities and debt to include in a portfolio.

So, we have established our criteria for good design. We need simplicity, scalability, sustainability, customisation and integration in the service of delivering members an inflation-adjusted income for life and managing the risk of them not getting there.

### **Next-generation retirement planning**

In order to receive an inflation-protected income for life upon retirement, individuals must expect to pay actual market prices. Thus, during the accumulation period of their lives, mark-to-market prices should be used. But where do we find such prices?

The answer is we can approximate them based on current market prices for inflation-protected bonds and annuities. What I suggest is that, rather than using arbitrary interest rates for the long run to estimate the price of the income stream at retirement, plan developers should use current market prices and mortality experience derived from actual annuity prices. They should mark to market the estimated price of the annuity stream with respect to interest rates and not to arbitrary or 'hoped-for' projections of those rates.

For example, if a plan is based on an assumed 4 per cent interest rate at retirement and the actual rate turns out to be 2 per cent, then retirees will not have the amount of money needed to produce the income they had counted on. Thus, estimated accumulation requirements for income goals must be based on actual interest rates. As well, the risks of interest

rate changes should be taken into account in the investment strategy during the accumulation period. That interest rate risk should be explicitly hedged using inflation-protected, long-duration bonds for the 'safe' component of the strategy.

In addition, plans need to be portable. They need to be protected against all credit risks, or at least against the credit risk of the employer. Plans also need a certain degree of robustness, and that robustness must be appropriate to the people who use them.

As an analogy, if I were designing a Formula 1 race car, I would assume that it would be driven by a trained and experienced Formula 1 driver. So, knowing that the car would not be misused in any way, I could build into its design a high degree of precision.

But if I were designing a family sedan, I would have to be more concerned about robustness. I would have to assume the owner would sometimes forget to change the oil or would occasionally bang the tyres into the kerb. Assuming the car would be misused to some degree, my design would have to be sufficiently solid to withstand less-than-optimal behaviour and yet still provide the intended outcomes.

In applying this analogy to financial plan design, one should probably not assume users will revise their savings rates in the optimal or recommended fashion.

### **Qualities of plan design: simplicity and constancy**

The simplest retirement solution is one in which the members do absolutely nothing. They provide no information and make no decisions. In fact, they are not engaged in the process at all until they reach retirement.

While such extreme behaviour is rare, to be robust, a well-designed retirement solution must be effective to that standard. We know that member engagement during the accumulation period can be very infrequent and unreliable, especially among those more than a decade away from retirement. Of course, at some point, most members will become engaged and the design should ensure that this engagement actually enhances the chances of success in achieving the desired income goal.

But how is that achieved?

To use the car analogy again, if I were seeking to sell my design to a professional race team, I would have to include numbers on the vehicle's compression ratio, total brake horse power, aerodynamics and other key technical indicators important to the operation of the car.

But for the average person, the key questions around a car purchase usually centre on things such as fuel efficiency, acceleration and safety features. To this person, those important technical numbers are not

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meaningful because they cannot interpret them in terms of what matters to them about the car's performance.

Likewise, in the retirement system, we need to design products based on questions that are meaningful for people, such as:

- > What standard of living do you desire in retirement?
- > What standard of living are you willing to accept?
- > What contribution or savings rate are you willing or able to make?

Such questions embed the trade-off between consumption during work life and consumption in retirement and they make sense to people, unlike questions about asset allocation (or compression ratios).

Besides creating a simple design with only a handful of relevant choices, we need a design that does not change, at least in the way that users interact with it. An unchanging design leads to tools that people will be more likely to learn and use. In fact, a design that is unchanging is almost as important as a design that is simple.

For example, I have been driving for 50 years and during that time the steering wheel in cars has not changed, even though automobile designers could have replaced steering wheels with joysticks. They have been careful to keep the car familiar so that users do not have to relearn how to drive each time they buy a new car.

The lesson is that something simple and consistent is easier for people to learn and remember than something complicated and changing. The goal is to be innovative without disturbing the user's experience. Planning for retirement is complex and it can be made even more difficult if the tools are difficult to use.

But ensuring ease of use for the individual does not rule out building in significant complexity and flexibility under the bonnet, including continuing innovation to improve the plan's performance.

Yet most of the models used to develop DC plans implicitly assume that numerous decisions are fixed, independent of changing market, personal or technological conditions. That is not an optimal design at all.

We must, therefore, design a system that is user friendly, one that people can become familiar with and thus are willing to use — a system in which the designers do the heavy lifting, so users need only make lifestyle decisions that they understand and the system then translates into the investment actions needed to achieve those goals.

The optimal strategies should guide users to arrive at their target retirement goals smoothly. The system will maximise the prospects of achieving a desired standard of living, subject to a risk constraint of a 'minimum or essential life income' amount in retirement.

Again, this is done in a way that provides meaningful choices to the individual, not just at the beginning of the process but all along the journey.

For example, when someone is diagnosed as having high cholesterol, their doctor does not deliver a lecture on the biochemistry of the cardiovascular system. Instead, he gives them a list of things they can do to improve their health — such as giving up smoking, losing a few pounds and starting a fitness program.

So it is the same with reforming our retirement system. When the individual's plan is running off course — that is, it looks very unlikely to be able to generate their desired target income goal — they are given three simple-to-understand choices of action:

- > increase their contribution rate (save more);
- > increase their retirement age (work longer); or
- > take more risk.

Those are all the choices — simple and stark, but effective. Other than lowering the goal itself, there are no other ways of addressing this problem.

However, optimisation is not simply about ensuring a desired level of retirement income. It is also about the efficiency or effectiveness in achieving that goal. Just as it is possible to save too little for retirement, it is also possible to save too much and face the regret of forgone consumption opportunities during the many years before retirement.

Despite these complexities, I am optimistic that such systems are doable, not with futuristic tools but with technology and tools that are available today. Indeed, such a next-generation system is commercially available today.

### **Technology and tools for creating products**

The paradox of the type of system I have just described is that the simpler and easier it is for retirees to use, the more complex it is for its producer.

The dynamic trading and risk assessment needed for the next-generation plan require sophisticated models, tools and trading capability, none of which needs to be explained to the individual.

Interestingly, the mean-variance portfolio model is still the core of most professional investment management models, even for sophisticated institutions. Certainly, it has been updated since its first use in the 1950s, but it is a tribute to Harry Markowitz and William Sharpe that it is still at the core of thinking about risk and return in practice.

But to design the next generation of retirement products, designers must consider explicitly some of the other dimensions of risk.

### ***Human capital***

Assume that a university professor and a stockbroker have the same present value of their human capital and the same financial capital. Their risk tolerances are also the same. When deciding which of the two should hold more stocks in their portfolio, most people intuitively respond that the stockbroker should. After all, stockbrokers typically know a lot more about stocks than professors do.

But, if we consider their situations more closely, we realise that the stockbroker's human capital is far more sensitive to the stock market than is the professor's. Therefore, to achieve the same total wealth risk position, the stockbroker should actually put less of his or her financial wealth into stocks.

Most models today take into account the value of human capital, but few consider the risk of human capital or how human capital is related to other assets. Since a significant component of retirement-dedicated assets is future contributions to the member's DC account and those contributions are linked directly to the future earnings of the member, taking account of both the magnitude and risk of that human capital asset is essential to a well-designed solution.

### ***Wealth versus sustainable income as the goal***

The second dimension is the use of wealth as a measure of economic welfare.

To illustrate, consider two alternative scenarios faced by the individual. In one, there are assets worth \$10 million. In the other, there are assets worth \$5 million. The environment with \$10 million can earn an annual riskless real rate of 1 per cent. The one with \$5 million can earn an annual riskless real rate of 10 per cent. Which is preferable?

Of course, if all wealth is to be consumed immediately, the \$10 million alternative is obviously better.

At the other extreme, suppose the plan is to consume the same amount in perpetuity. A few simple calculations reveal that the \$5 million portfolio will

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produce a perpetual annual inflation-protected income of \$500,000 and that the \$10 million portfolio will produce only \$100,000. So, with a long-enough horizon for consumption, the \$5 million environment is preferable, because of the more favourable investment opportunity environment.

The 'crossover' time horizon for preference between the two is at about 10 years. Thus, we see that wealth alone is not sufficient to measure economic welfare.

How many advice engines take this dimension of a changing investment opportunity environment into account? Many such engines quote retirement income as an end goal, but in doing so they take an estimated wealth amount and simply apply the annuity formula with an assumed fixed interest rate to it, as if there were no material uncertainty about future interest rates.

In other words, they do not distinguish between the standard of living and wealth as the objective.

Sustainable income flow, not the stock of wealth, is the objective that counts for retirement planning.

Imagine a 45-year-old who is thinking in terms of a deferred fixed-income stream that starts at age 65. The safe, risk-free asset in terms of the objective function is an inflation-protected lifetime annuity that starts payouts in 20 years. If interest rates move a little bit, what happens to the value of that deferred real annuity? It changes a lot, because of its very long duration.

If I report the risk-free asset the way typical superannuation accounts are reported – namely as current market value or wealth – the variation reported in wealth every month will be tremendous. But if I report it in annuity (or lifetime income) units, it is as stable as a rock. Stable-wealth assets like short-term Treasury bills do not provide stable income and indeed the income they provide is quite volatile as interest rates vary. Long-duration, bond-like assets provide stable income but their price volatility is considerable as interest rates vary.

How plans are framed and how their values and risks are reported (wealth versus lifetime income units) is thus not trivial. The proper unit of account selected is essential for conveying what is risky and what is not, and thus for making appropriate portfolio allocations.

### **Essential and desired income goals**

The system I am describing seeks to increase the likelihood of reaching nominated income goals by sacrificing the possibility of doing significantly better than desired. In a nutshell, we are narrowing the distribution curve of possible outcomes. We do this by setting desired and essential target income goals. Let me explain.

For an unengaged member, the desired and the essential target income goals are set by the plan sponsor under the advice of professional consultants. The goals are based on what a member with a given profile would likely see as a good retirement income and on how much risk would be acceptable in trying to achieve that goal. (These same default settings are available as guidelines to members who do become engaged and can be modified by the members to better fit their individual circumstances.)

The level of the desired target is set as an estimate of the inflation-protected income necessary to maintain a comfortable standard of living. The essential target is defined as a level of income that while not guaranteed, has a very high probability of being achieved (>96 per cent), and which serves to indicate the degree of risk of the member's strategy.

Both levels must satisfy feasibility conditions.

The goal is to maximise the estimated probability of achieving the desired target income level, subject to meeting the highly probable conditions of the essential target income level. As the essential target income level increases, the risk of the strategy must fall, but so does the likelihood of achieving the desired target income level.

If the amount of retirement-dedicated assets reaches a level at which the estimated probability of the desired target income level being achieved exceeds 96 per cent, the allocation reduces risk as much as possible so as to maximise the chances of achieving the goal at retirement. This is called 'lock in'.

In effect, by taking as much risk as possible off the table when it is no longer needed, we are trading off the possibility of achieving 'even more' against increasing materially the probability of achieving the goal. Or, put another way, the strategy is focused entirely on achieving the goal subject to the essential income and gives no weight to achieving more than the goal.

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The combination of the essential target income limiting the downside and lock-in cutting off the upside significantly narrows the distribution of possible outcomes relative to traditional DC asset allocation strategies, such as the glidepaths of target-date funds. At the same time, it increases the estimated probability of reaching the desired outcome, relative to these less-focused strategies. Indeed, target-date funds rarely express an explicit investment goal. Instead, they simply specify an investment process through their age-dependent glidepath asset allocation schedules.

If at any time the member's progress suggests their probability of reaching the desired target income goal is below a specified threshold — say 50 per cent or less — the system gets in touch with them, tells them that they have a problem and provides them with the three actions they can take to improve their chances of success — increase their monthly contributions, raise their retirement age and/or take more risk (similar to a doctor after a health check-up).

These pension alerts during the member's accumulation period also formally document the systematic process under which the plan sponsor and trustees, as part of their fiduciary responsibilities, sought to guide that member to a good retirement outcome.

## **Conclusion**

In designing a new retirement system, first we need to define our goal. We have decided that our goal is to help participants achieve inflation-protected income throughout retirement.

While the traditional DB retirement system is no longer sustainable, its typical DC replacement requires individuals to make overly complex decisions and bombards them with jargon that is meaningless to them.

What I have mapped out is a fully integrated system that moves the goal from amassing a lump sum to achieving a retirement income for life. Asset allocation

strategies are personalised. And, each participant is given regular updates on how they are travelling in ways that make sense to them.

Unlike simple target-date funds that mechanically set the asset allocation using a crude calculation based on a single variable — the participant's age — we have created a customised, dynamically managed solution based on each participant's tailored goals for desired outcomes, life situation, expected future contributions and other retirement-dedicated assets, including current DC accumulations, any DB benefits, and age pension benefits.

To improve effectiveness of engagement, all of the complexity is kept under the bonnet. The user is asked a series of simple questions around their essential and their desired income targets. Once they achieve a very strong likelihood (more than 96 per cent) of reaching that desired income, they lock in an asset allocation to match the purchase of that desired lifetime income at retirement.

This is not a hypothetical system. It is already in place in Europe and is being introduced in the United States. And, it begins and ends with turning the focus back onto what superannuation should be about — ensuring people have adequate incomes in retirement. ■