A benefits model for South Africa

A new approach for deploying compulsory savings

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Authors and contributers

Alexander Forbes
Research Institute

CAN WE POSSIBLY HAVE IT ALL?

Rather than applying a time-varying approach to allocating capital for each individual goal, we use a concept borrowed from lifecycle investing: we approach the problem by using a constant savings percentage towards all goals simultaneously which, provided the contribution is sufficient, dynamically allocates to the different financial goals. The solution adopts a combination of goals-based investing, lifecycle investing and liabilitydriven investing strategies.

We've built a simplified model using the following assumptions:

1. A man enters the workforce at age 23 and retires at age 63. We use Alexander Forbes annuity rates for males.
2. His real salary will increase according to the Alexander Forbes actuarial salary scale tables (not published).
3. He earns a starting salary of R72 000 a year.
4. He starts the savings programme for all goals from the first day of working.

5 His overall intentions are:

Get to at least a 50% replacement ratio on retirement.

Build and maintain an emergency fund of three months' salary.

Provide a full education (from age six up to tertiary) for his two children born when he is 25 and 27.

Fund and pay off a starter house with a real value of R250 000 within 20 years (using the savings and debt model illustrated in **Part 2: Chapter 8**).

6 **A real return of 4%** (after costs) is assumed for the investment strategy that linearly reduces to 2% over the last five years to retirement, representing less risky investment strategies during a period where an individual's general risk aversion increases.

7 **A post-retirement interest** 'rate' of 3.25%, five years full pension guaranteed, with 50% pension reverting to the spouse on death.

8 **The emergency fund** is topped up every five years. It assumes 0% real growth and that 50% of its value is drawn down through each five-year cycle.

9 **Primary and secondary school costs** are R29 000 a year. Tertiary education costs are at R50 000 a year funded for four years. Education costs grow at at 3% above CPI inflution.

10 **The real value of the house** purchased in 20 years is at least R250 000.

11 **Tax effects are not considered**.

12 **Risk benefit costs** are ignored for this simplified model, but these would be based on a lifecycle model of expenditure of its own. We discuss this lifecycle risk benefit concept in **Part 2: Chapter 7**.

Modelling outcomes and insights

Estimated cashflow profile (from age 23 to age 63)

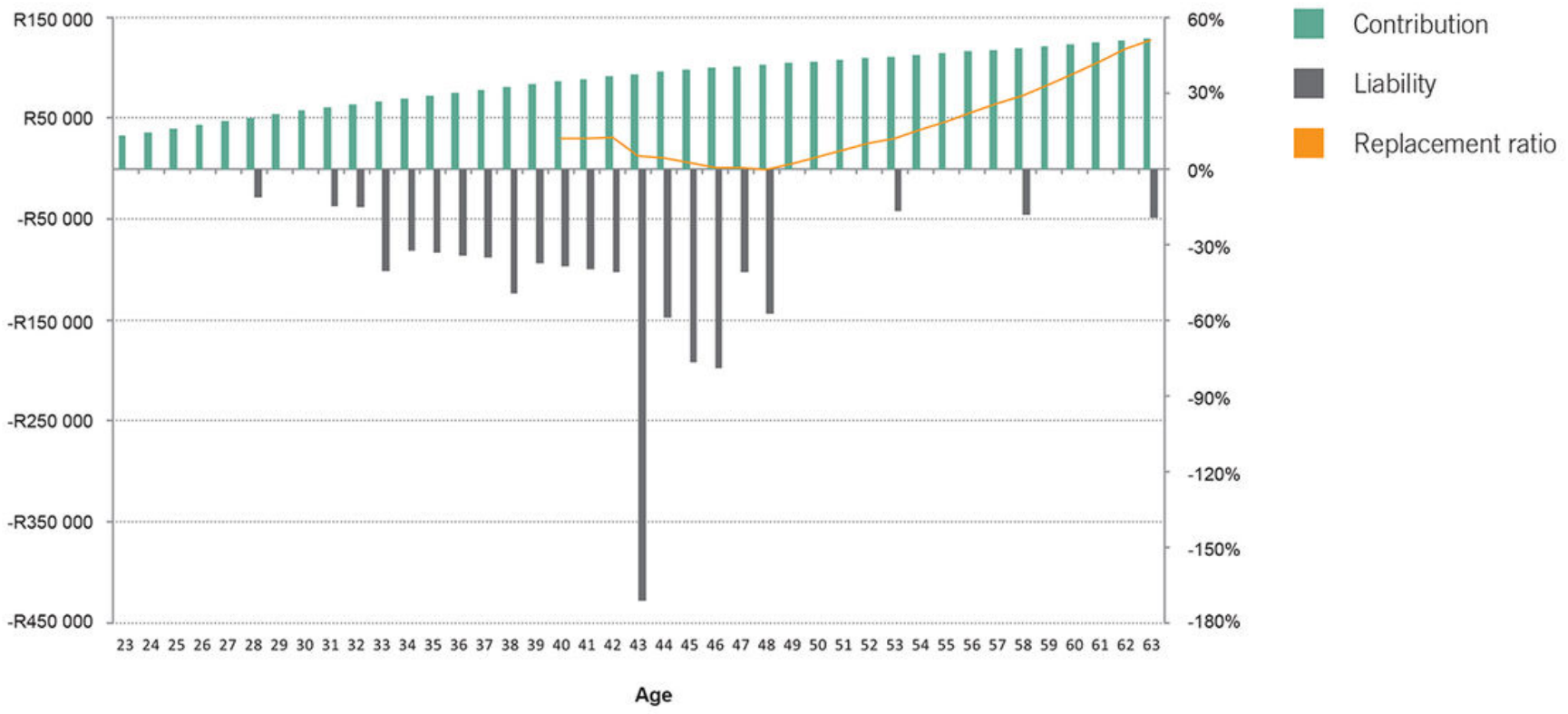

Figure 1: Expected cash flow profile over 40 year working lifetime 23 to 63 years

Based on the assumptions, the model solves to a 46.2% lifetime contribution from age 23 to retirement at age 63 to approximately meet all objectives:

- The individual achieves a 51% replacement ratio.
- He can pay off his home of R250 000 within 20 years at age 43.
- He has funds to dip into for emergencies.
- He can pay for his children's education.

A 46.2% constant contribution, although meeting the investment objectives, would not provide the required means to support day-to-day living for an individual earning R72 000 a year, especially during the early years. At this contribution rate, despite the expected benefit, the savings programme would not be feasible against more immediate consumption needs. At R60 000 a year this rate jumps to almost 55%.

Absorbing housing costs, which include rental costs and interest rate funding early in the lifecycle, would force contribution rates to above 55%.

Another significant factor to the high contribution required is the requirement of capital from the time a person is employed to the time a child needs to start school. Research presented earlier in the book outlines the need for effective primary education to maximise the chances of the future human capital trajectory. Accessing good early education for the child is clearly imperative. This is one of the areas where investments can't be stretched to create healthy outcomes. Good, cost-effective schooling is a social imperative that can only be met with significant sacrifice by most employees, if these are the true costs they face.

A further insightful observation is that a constant allocation towards each savings goal is ineffective. Despite a constant overall savings rate, the allocation to retirement savings remains negligible until the costs for a home and education costs are paid. Retirement savings as measured by the replacement ratio is almost zero at age 48. This variable allocation would be consistent with the principles in lifecycle investing.

For the savings programme to succeed for low-income earners, we need to explore other levers where investments can lower the overall contribution:

1. Using the power of time by effectively providing more time to contribute and grow capital before school expenses are needed and more time to recover to retirement
2. Introducing subsidisation by understanding the level of subsidisation required to provide an equitable balance for low-income households.

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Using the power of time

We see the power of compounding quite dramatically if the individual started work two years earlier at age 21 and retired two years later at age 65:

Estimated cashflow profile (from age 21 to age 65)

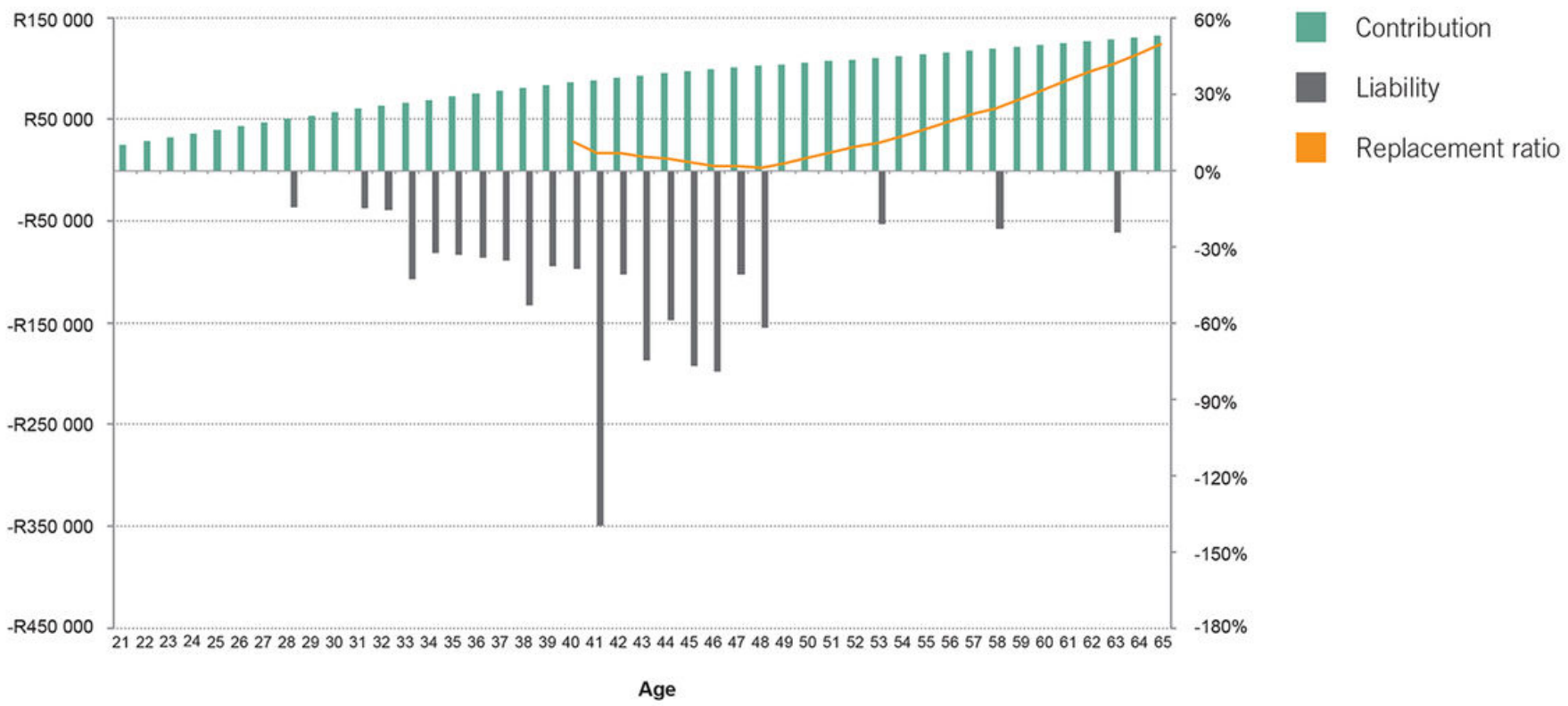

Figure 2: Expected cash flow profile over 44 year working lifetime 21 to 65 years

Based on the assumptions, the model now solves to a 36.5% lifetime contribution to meet all objectives:

- The individual achieves a 51% replacement ratio.
- He can pay off his home of R250 000 within 20 years at age 41.
- He has funds to dip into for emergencies.
- He can pay for his children's education.

This is almost a 25% improvement, which can significantly improve the use of and commitment to the savings programme. While this demonstrates that additional time is meaningful and any savings programme of this nature should be implemented as early as possible, 36.5% still remains high.

To address this, we'd like to see schooling and employee programmes introduce behavioural and educational programmes that highlight the value of compounding.

Subsidisation: what expense structure can we tolerate?

The liability streams of these savings goals are onerous, particularly the education expense, which is also the most important element for ensuring social
mobility from one generation to the next. The inability to finance this cost not only impacts on a family but on the country as a whole, as it will fail to
improve the social fabric of its communities, creating a deeper reliance on the government.

If we remove the requirement to fund education, it's possible to meet the remaining goals with only a 20% contribution, while funding the house quicker, within 16 years.

Estimated cashflow profile (from age 23 to age 63)

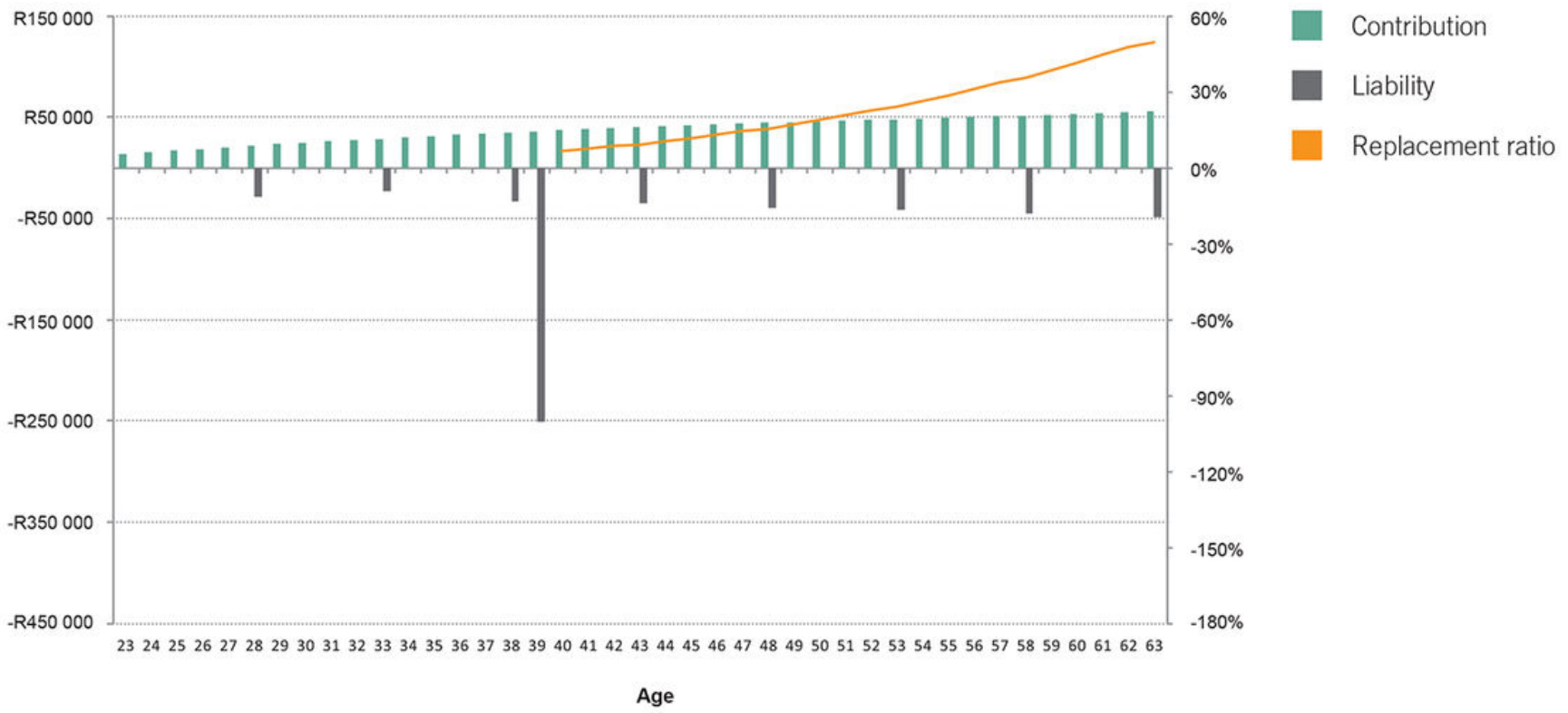

Figure 3: Expected cash flow profile (no education costs) over a 40-year working lifetime 23 to 63 years

Table 1: Contribution rates required for different levels of salary

	Annual starting salary						
	R72 000	R84 000	R96 000	R108 000	R120 000	R132 000	R144 000
Final projected replacement ratio	-12.2%	4.4%	16.8%	26.5%	34.2%	40.6%	45.8%
Maximum shortfall through lifetime	-R1 055 500	-R768 700	-R482 000	-R195 200	-	-	-
Subsidisation on education to meet all goals	60%	52%	43%	34%	26%	17%	9%

This table demonstrates that unless the real income of a 23-year-old exceeds R144 000 a year, reflecting only a small percentage of highly qualified graduates, the savings programme will require lifetime contributions above 30%. We don't see this readily being taken up as individuals will struggle to relate the use of this deferred consumption (although probable) to immediate consumption needs.

To improve this, we need to reduce the contribution rate. The only way we can envision this is by introducing some form of subsidisation against the costs.

Subsidisation includes any programme or process that will reduce the overall cost of the goal and thereby reduce the contribution rate. This can be across any of the expenses in the savings programme. However, given the impact of education, we take an explicit look at approaches to reduce these costs surrounding education:

- **Direct subsidies:** public school feeding programmes, public school textbooks
- **Regulated exemptions:** government notice October 2006, for example, introduces a section for the exemption of the payment of school fees in public schools
- **Indirect subsidies:** Fundisa
- **Matched (or partial) employer subsidies:** contributions made by the employer to match contributions made by the employee for certain specific payments such as school fees or uniforms

Table 2: Expected outcomes on a 30% contribution

	Annual starting salary						
	R72 000	R84 000	R96 000	R108 000	R120 000	R132 000	R144 000
Final projected replacement ratio	-12.2%	4.4%	16.8%	26.5%	34.2%	40.6%	45.8%
Maximum shortfall through lifetime	-R1 055 500	-R768 700	-R482 000	-R195 200	-	-	-
Subsidisation on education to meet all goals	60%	52%	43%	34%	26%	17%	9%

Assuming that a 30% contribution rate is acceptable, let's review its impact on the ability to meet the goals, measured by: the projected replacement ratio, which is the last of the financial goals to be met any shortfall in funding the savings goals at the required time.

For earnings less than R108 000 a year, a 30% contribution will result in:

- replacement ratios becoming significantly low, as a person earning R72 000 a year will be in debt on retirement
- a funding gap at some stage in the cycle, as a person earning R72 000 a year will experience a severe funding shortfall of over R1.055 million.

The table also reflects the amount of subsidisation required on education costs to meet all goals. For someone earning R72 000 a year, the cost needs to be subsidised by 60%. As school fees are just a component of the education costs for primary and tertiary education, a 100% waiver on fees will only translate to about a 30% reduction (assuming R9 000 school fees), but more than 60% for tertiary education. This implies that over the early years an individual (translated into a household) will require greater assistance to access and support children at school. A higher-earning individual will also require assistance but a 33% reduction in school fees will have the required impact.

DESIGNING THE INVESTMENT STRATEGY

The traditional form of investing, which maximises expected return for a given level of risk, usually measured as volatility or the standard deviation of the expected returns, has proven woefully inadequate to meet the demands of an individual's or household's fi nancial needs.

A different approach is needed, one which recognises:

- the purpose and importance of the savings goals
- how much is actually needed (the liability)
- when it's needed, over what horizon
- what risks the savings goals are exposed to
- how much of this risk can be tolerated
- what happens if the individual doesn't meet the objective at the right time
- how much is available to meet this goal.

That being said, the future remains uncertain, and we can't factor in all outcomes. But what is important is that a strategy takes cognisance of known factors and adapts to these risks. This is the basis of goals-based investing.

Goals-based investing is an application of an institutional technique called asset-liability management, which is a framework for ensuring that future expenses (liabilities) are funded as they are expected. An asset-liability model remains the critical approach for most defi ned benefi t pension plans. One of the key techniques applied is a stochastic estimate of the value of each liability for each date in the future. This, in turn, applies an asset-based investment strategy that focuses on meeting the ability to fund each and all liabilities as they become due. The goals-based investment framework adopts the same philosophy in a far more generalised form:

- Define and prioritise multiple unique savings goals over different horizons
- Identify the types of risk each savings goal is exposed to
- Differentiate their capacity to take risk for each objective
- Establish specific success criteria for each objective
- Adapt and restructure their strategy as time, markets and circumstances change.

Goals-based solutions are built on three main approaches:

1. **Static methods** construct portfolio solutions that use a long-term, static, strategic asset allocation that can achieve predefined investment outcomes. We generally apply a stochastic simulation to optimise the match between the returns and liabilities. It's usually a long-term simulation that doesn't recognise shortterm market risks. This is the weakest approach to solving the problem. It goes beyond the traditional approach to solving the investment problem by varying the definition of risk to go beyond simple volatility by including alternative measures such as funding level risk and capital loss.
2. **Dynamic methods** apply dynamic asset allocation techniques to change the asset strategy mix of an individual portfolio based on market movements, risk exposures and maximising the probability of achieving target objectives. As the goal has greater certainty of being met, these portfolios will reduce the risk they take. This is similar to liability-driven investment strategies that institutional pension fund assets use. In many instances, these solutions can explicitly target and achieve those targeted outcomes.
3. **Independent individual solutions** start with the existing assets of the individual and then build a dynamically managed optimal portfolio that could include an infinite range of assets and securities. We can consider this as an individual asset-liability modelling exercise that's constantly adapting. Unfortunately, this type of modelling doesn't add significant benefit to a savings problem with no financial capital, which is the general case for South Africa.

Goals-based frameworks differ from traditional performance-based frameworks in that success is not measured by beating a market benchmark, a peer fund or ensuring that the investment strategy is on the efficient frontier. It requires the investment strategy to consider the context of the liability, the horizon and the specific risks of failure.

Goals-based investing shifts the typical investment conversation from best performing products towards establishing the correct financial outcomes. It follows that determining the correct goals, managing to meet those goals, maximising the probability of success, and helping the individual understand the impact would lead to better financial behaviour and outcomes.

Concluding thoughts

The average individual will probably face the same savings challenges over their lifetime. In trying to meet them, it's likely that they would try to achieve these goals independently, resulting in severe cashflow pressures at multiple stages as well as debt. The objective here is to get people to understand that the high savings rate provides a better lifetime use of earnings than trying to achieve these goals on their own.

A lifetime savings programme is more efficient in achieving multiple goals in a structured way. However, given the low levels of income that many individuals have to survive on, accessing similar savings through retail channels can also be expensive. A public-, industry- or employer-driven solution can aggregate costs and administer such a programme more effectively. The issue is less about **who** does it, than it is about ensuring that **someone** fulfils that role.

Another challenge is that the cost of education and housing is high relative to earnings. As such, either contribution rates are higher or costs subsidised meaningfully for each earnings group. Raising salaries only creates inflation, which may drive these costs up even more.