

## ***In-depth with The Conexus Institute***

# **What is the role of CPI+ investment objectives?**

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## Executive summary

- 1. About this report** – We examine the concepts behind formulating and investing towards CPI-plus (CPI+) or real return objectives and their application and communication in practice, focusing on their use by superannuation (super) funds. A wide range of topics is addressed to provide a comprehensive overview.
- 2. Key messages** (Sections 1 and 9) – CPI+ objectives have a role to play, particularly in member communications, but struggle in other aspects. Despite the logic of focusing on real long-term returns given that accumulating more wealth translates into better retirement outcomes, applying CPI+ objectives to portfolio construction and performance assessment is problematic. Super funds are constrained in effectively managing towards CPI+ objectives as stated strategic asset allocations (SAAs) act as anchors, the presence of relative return objectives that are often given higher priority, as well as various portfolio constraints and behavioural influences. CPI+ benchmarks are ineffectual for performance assessment as the outcome depends on broader market movements. There is merit in reporting CPI+ objectives and connecting them with long-term risk measures to assist members with forming expectations and investment choice. Here their effectiveness is inhibited by inconsistencies in how objectives are being presented to members both across and within super funds; and the use of the Standard Risk Measure (SRM) as a risk proxy, which is poorly paired with CPI+ as a long-term objective.
- 3. Brief rationale and history** (Section 2) – CPI+ objectives reflect the importance of real returns under lifecycle theory. They are most relevant for investors concerned with long-term wealth accumulation, while real return targets are a legislative requirement for MySuper products.
- 4. Potential purposes** (Section 3) – Five potential purposes for CPI+ objectives include: (i) an investment objective to manage portfolios towards; (ii) a benchmark for performance assessment; (iii) communicating expectations and assisting with member choice; (iv) meeting reporting requirements; and (v) a marketing instrument. For super funds, their effectiveness for the first two purposes is quite limited while application under the other three purposes leaves much to be desired.
- 5. Determination** (Section 4) – CPI+ objectives might be set with reference to either a proposed real return target, risk budget or proposed portfolio structure; or in an integrated fashion considering all three in combination. They could be modelled using either long-term average or time-varying expected returns.
- 6. Framing by super funds** (Section 5) – There are some disturbingly large variations and inconsistencies in the investment objectives being presented to members. Differences exist within super funds between real return targets on MySuper dashboards and their stated CPI+ objectives. There is also weak alignment between CPI+ objectives and ‘risk’ proxies such as the SRM and growth/defensive mixes across funds.
- 7. Construction of multi-asset portfolios** (Section 6) – Constructing a CPI+ portfolio requires balancing the desirability of higher expected real returns (i.e. a larger ‘+’ component) in pursuit of better outcomes against risk. Relevant risks to consider include: (i) the probability and magnitude of potential shortfall over the long-term; (ii) volatility over the shorter-term; and (iii) sequencing effects under portfolio flows. Achievement of CPI+ objectives over the long run requires investing in assets that offer expected real returns equalling or exceeding the target, which typically necessitates significant growth asset exposure that heightens risk. Equities dominate risk for multi-asset portfolios such as super fund growth options.
- 8. Investment selection** (Section 7) – Attributes of investments that may be beneficial under a CPI+ objective include: (i) offer an expected real return in excess of the target; (ii) helps to protect against sustained loss of wealth from other portfolio assets; and (iii) inflation hedging characteristics. Assets with all three attributes are rare, if not mythical, beasts. Assets offering inflation-linked cash flows do not necessarily protect against inflation shocks due to potential for discount rates to increase with inflation.
- 9. Improving the framing of investment objectives** (Section 8) – We discuss four ideas: (i) introducing a simple reference portfolio (SRP) as a bridge between CPI+ objectives and portfolio construction and performance assessment; (ii) addition of a well-designed long-term risk measure; (iii) declaring all investment objectives to members; and (iv) increase consistency in disclosed CPI+ objectives.

# 1. Introduction

CPI+ investment objectives, also known as inflation-plus or real return objectives, are widely adopted both in Australia and overseas in the context of multi-asset funds. Multi-asset funds offered by super funds are typically accompanied by CPI+ objectives, and there is a legislative requirement for MySuper products to state and report against a real return target. Other prominent examples include the Future Fund, many endowments and foundations and 'real return' funds offered by investment managers. This report investigates the role of CPI+ objectives in the Australian super industry.

CPI+ objectives seem eminently logical in a retirement savings context. The wealth that is accumulated by a fund member and the purchasing power of the retirement income they can afford is a direct function of real return. The problem is that super funds find it difficult to effectively manage their portfolios towards CPI+ objectives. An underlying issue is limited control over the real returns that are ultimately generated. Exposure to risk assets is necessary to achieve a CPI+ objective over the long run – especially under a sizable '+' component. However, realised real returns depend on what markets at large deliver, in particular equity markets. Super funds can only influence real return outcomes at the margin. One consequence of the inability to control what markets at large deliver is that CPI+ objectives are rendered largely ineffectual as a benchmark for performance assessment. While super funds have mainly achieved or exceeded their stated CPI+ investment objectives, this has more to do with what markets have delivered than investment skill.

Nevertheless, it may still be possible for portfolio construction to be framed around a CPI+ objective. This can be done by focusing on the likelihood of achieving a CPI+ target return, and adjusting the portfolio in response to changing market opportunities to maximise real expected returns while managing risk of shortfall versus the CPI+ objective. Unfortunately, super funds are highly constrained in managing in this way, which requires a capacity to make *significant* portfolio adjustments in response to variation in expected returns across assets. Key constraints include:

- Limited scope to adjust or deviate from stated SAAs, which effectively act as anchors;
- Presence of relative return objectives such as the Your-Future-Your-Super (YFYS) performance test and peer comparisons, which are often given higher priority;
- Portfolio constraints such as fee budgets and illiquidity limits; and,
- Behavioural influences related to individual incentives, reputation and pressure to embrace fads.

Simply, super funds find it hard to make the significant adjustments to their portfolios that are required to maximise the potential to achieve or exceed a CPI+ objective.

Although we are sceptical of CPI+ objectives as an effective compass for constructing portfolios and a performance benchmark, we see potential merit in CPI+ objectives for use in member communications. Confronting members with the balance between long-term expected real returns and risk can inform members about what real returns to expect, and the long-term risk-return trade-off across investment options. Unfortunately, the super industry is presently not doing so effectively due to some (disturbing) inconsistencies in how investment objectives and risk are being communicated to members, including:

- Super funds often apply different formulations for CPI+ objectives stated in product disclosures and the real 'return target' quoted on MySuper dashboards, with either measurer being reported to members in different settings even though the underlying strategy may be the same.
- The SRM is presented to members as a risk measure, but is poorly paired with CPI+ for characterising the risk-return trade-off as CPI+ is a long-term objective while the SRM reflects shorter-term volatility.
- There is weak alignment between the real return targets on MySuper dashboards and risk proxies such as the SRM and growth/defensive mix, suggesting that super funds are applying differing methods in formulating their stated objectives.

The current settings thus risk confusing and misleading members rather than informing them over the long-term return versus risk trade-off across investment options.

We offer four ideas that could help improve the application of CPI+ objectives in the super industry:

1. **Introduce SRPs** – An SRP can act as a bridge between CPI+ objectives and portfolios, and thus help address the issues around limited control over broader market movements and performance assessment. SRPs do so through presenting the investment team with a benchmark to both manage towards and for assessing their performance, thus providing separation between the setting of objectives and management of portfolios. Super funds should consider establishing SRPs for internal use and possibly reporting performance to members. We would also like to see them introduced into the YFYS performance tests under the current Treasury review as part of a three-metric test.
2. **Introduce a long-term risk measure** – We see value in introducing a long-term risk measure to sit alongside CPI+ objectives and perhaps the SRM, even though it adds some complexity. A few super funds already communicate to members how risk varies with horizon for various investment options.
3. **Communicate all objectives** – Member communications would be improved by disclosing the presence of other investment objectives to members so that the CPI+ objective is not positioned as the sole undertaking.
4. **Improve consistency in objectives being disclosed to members** – Members would benefit from greater standardisation of CPI+ objectives and related risk measures. At a minimum, the dichotomy should end between how real return targets on MySuper dashboards and other formulations of CPI+ objectives such as those appearing in product disclosure statements (PDS's) for individual super funds. The question of standardising how the CPI+ objectives are formulated across super funds is more vexed. While this could provide greater clarity for members, it would introduce a range of issues that could offset any benefit. Nonetheless, we recommend this matter is given further consideration.

This report considers both the concepts behind formulating and investing towards CPI+ objectives and how they are being applied and communicated in practice. We focus on super funds but offer a contrast against other investor types where relevant. Our discussion implicitly treats CPI+ objectives and real return targets as synonymous and both equal to an expected real return, while recognising that some in the super industry at times formulate CPI+ objectives as a real return that is deemed achievable to a particular level of confidence (e.g. two-thirds). We also assume that CPI+ objectives relate to returns after taxes and costs adjusted for the Consumer Price Index (CPI).

## Report roadmap

- [Section 2](#) - Describes the rationale and history of CPI+ objectives.
- [Section 3](#) – Outlines five potential purposes of CPI+ investment objectives.
- [Section 4](#) – Considers how CPI+ objectives might be defined and determined.
- [Section 5](#) – Examines disclosure of CPI+ objective and related ‘risk’ proxies by super funds.
- [Section 6](#) – Discusses construction of multi-asset portfolios under CPI+ objectives, focusing on the trade-off between the ‘+’ component and the need to take investment risk and related consequences.
- [Section 7](#) – Considers asset selection under CPI+ objectives.
- [Section 8](#) – Explores some ideas to improve the framing of investment objectives.
- [Section 9](#) – Concludes with some closing thoughts.
- [Appendix A](#): Portfolios of real return funds offered by Australian investment managers
- [Appendix B](#): Inflation-protected bond returns under CPI+ objectives
- [Appendix C](#): Selected feedback we received and our response

## 2. Brief rationale and history of CPI+ objectives

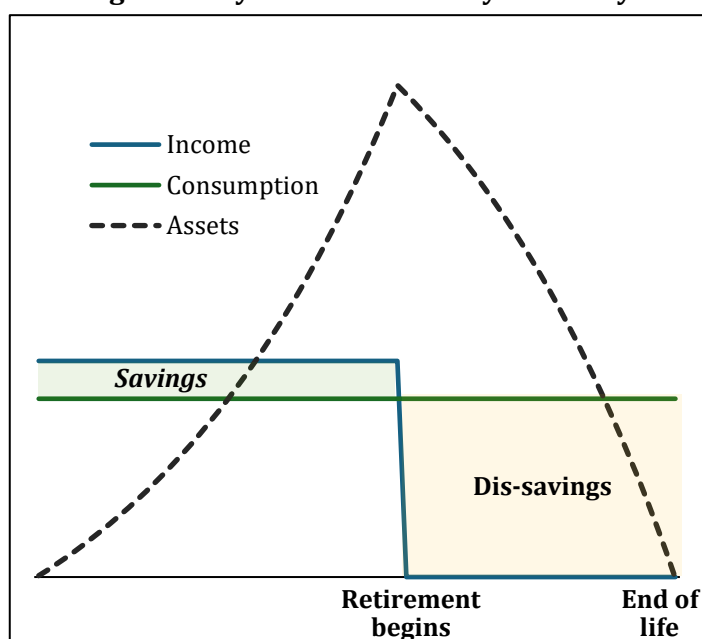
### 2.1 Links to lifecycle theory

CPI+ objectives have their origins in lifecycle theory, which sits on the foundations built by notable economists such as Frank Ramsey, Irving Fisher, Franco Modigliani, Richard Brumberg, Milton Friedman, Paul Samuelson and Robert Merton. Lifecycle theory suggests that it is rational for people to take steps to spread their consumption over their entire lives, i.e. consumption smoothing. A central implication of lifecycle theory is that people should save some of their working income to create a pool of financial assets to support consumption in retirement, as represented in varying forms by pension systems around the world. Framing lifecycle theory in terms of consumption establishes purchasing power as a central consideration. Consumption in retirement depends on the purchasing power that the savings deliver, which in turn is a function of how much is saved and the *real return* on those savings. A CPI+ objective essentially represents the real return that is targeted and might be expected.

Figure 1 is a stylised and much-simplified<sup>1</sup> depiction of lifecycle theory. In particular, the analysis is deterministic and ignores investment risk (which we consider in Section 6). The figure depicts how a portion of income is saved until retirement followed by a period of dis-savings where assets are drawn on to generate income in retirement thus providing stable consumption over the lifecycle. Achieving higher real returns can raise consumption over the lifecycle through (a) allowing less to be saved and so more to be spent pre-retirement, and (b) purchasing power to support income in retirement is boosted by more wealth being accumulated per dollar saved.

A further takeaway is that investing over the lifecycle occurs over a long horizon and calls for a long-term perspective. Even once an individual retires, they may still expect to live for another 20-30 years or more.

Figure 1: Stylised view of lifecycle theory



### 2.2 A very brief history of CPI+ objectives in Australia

The initial motivation for CPI+ objectives relates to defined benefit (DB) funds and the concept of asset-liability modelling or matching<sup>2</sup>. The logic is that the liabilities of DB funds are fundamentally linked to movements in wages and salaries<sup>3</sup>, which are in turn broadly linked to inflation. Thus CPI+ objectives were used to capture the expected relation between investment return, wages growth and inflation. For instance, a CPI+3.5% objective might comprise a targeted 2% gap between expected investment returns and wages, coupled with the assumption that wage growth would exceed inflation by 1.5% in reflection of productivity growth. (Note: Appendix C discusses how CPI+ objective may relate to the concept of

<sup>1</sup> Figure 1 is expressed in real terms and assumes constant consumption throughout the lifecycle, constant savings pre-retirement, known investment returns and known time of death. In practice, investment returns, wages and inflation as well as savings and consumption choices may all vary over time and give rise to complex interactions. It also ignores other considerations such as the need for lowering spending in retirement to maintain a given standard of living and the presence of social security (e.g. the Age Pension).

<sup>2</sup> We thank David Knox from Mercer for these observations.

<sup>3</sup> The valuation of DB liabilities reflects other inputs such as interest rates and actuarial assumptions. Nevertheless, the underlying cash flows to be paid out are largely wages-linked in most instances.

liability-driven investing and the possibility of using wage+ objectives as an alternative, around which we received a few comments during feedback.)

The earliest example we found of the use of CPI+ objectives within the Australian super industry for defined contribution (DC) funds was from 1996-97 for the Commonwealth Super Scheme (CSS), which stated an overarching objective to “*maximise real returns on members’ accumulation fund subject to a tolerable level of shorter-term volatility*”<sup>4</sup>. The Super System Review (Cooper, 2010) formalised the focus on CPI-linked objectives, as part of recommending a more standardised approach to setting and reporting investment objectives. Cooper (2010) recommended that super funds should set and report against a “*net investment return target (after-tax), which should be expressed as a percentage above CPI, over a rolling 10-year period*”, which was endorsed by the Government and legislated into [Reporting Standard SRS 700.0 Product Dashboard](#) through the Financial Sector (Collection of Data) Act 2001. Under this legislation, all funds are required to set and report a return target for their MySuper product that “*represents the mean annualised estimate of the percentage rate of net return that exceeds the growth in the CPI over ten years*”. Given the importance of MySuper products and the requirement to maintain processes and systems that support the setting and reporting on real return targets (which might be viewed as a form of CPI+ objective), it is unsurprising that super funds also frame up CPI+ objectives more broadly including for most multi-asset options.

CPI+ objectives are often used by various types of investors where the purpose entails accumulating real wealth over the long run. A good example is the Future Fund, which according to its [Annual Report for 2022-23](#), was established in 2006 with the aim of “*helping to strengthen Australia’s balance sheet and long-term financial position*”. The mandate for the main Future Fund is to: “*achieve an average annual return of at least the Consumer Price Index (CPI) + 4.0% to 5.0% per annum over the long term, with an acceptable but not excessive level of risk*”. Three other funds managed by the Future Fund also adopt objectives of CPI + 2% to +3%. Endowment and foundation funds are other examples. For instance, the [Long Term Fund of the Sydney University endowment](#) has an objective of CPI+4.5%<sup>5</sup>.

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<sup>4</sup> See [CSS Board 1996/97 Annual Report](#). The broader objectives was distilled into a fund objective to maximise the long-term real rate of return subject to less than 20 per cent probability that nominal fund returns will be negative in any given year, more than 60 per cent probability that the crediting rate will exceed CPI by three per cent in any given year, and more than 70 per cent probability that the crediting rate will exceed CPI in any given year. All three criteria were used by CSS to define a ‘tolerable’ level of volatility.

<sup>5</sup> Sydney University’s Short Term Fund references returns on the Bloomberg AusBond Bank Bill Index, while their Medium Term Fund references the Bloomberg AusBond Bank Bill + 1.5%.

### 3. Purpose of CPI+ objectives

We consider CPI+ objectives within the context of the purpose of investment objectives more broadly. Figure 2 summarises five potential purposes of forming investment objectives and the role of CPI+ objectives under each purpose, which are each then discussed in turn. The five purposes are not mutually exclusive and may operate concurrently.

A central message is that CPI+ objectives are *relatively ineffectual* for super funds as a basis for managing portfolios and a benchmark for assessing performance in a large part due to the presence of other objectives, especially relative to investors where a CPI+ objective is primary such as the Future Fund or many endowments and foundations. While they can be helpful for communicating and engaging with members in a long-term framing, current industry practices limit their effectiveness for this purpose.

**Figure 2: Summary of purposes of investment objectives and the role of CPI+ objectives**

Purpose	Effectiveness	Comment
1. Objective to manage towards	Some	<ul style="list-style-type: none"> <li>• Super funds might focus on the probability of achieving CPI+ objectives at the objective and SAA formulation stage</li> <li>• Nevertheless, super funds cannot readily actively manage towards CPI+ objectives due to limited control over what markets deliver combined with structural constraints that act as anchors, including:               <ul style="list-style-type: none"> <li>- Difficulty in deviating significantly from stated SAAs</li> <li>- Presence of other objectives including the YFYS performance test and returns versus peers, which are often given higher priority</li> <li>- Other constraints such as fee budgets and illiquidity limits</li> <li>- Behavioural influences at play, e.g. incentives, reputation, fads</li> </ul> </li> <li>• Some non-super investors may more effectively manage towards CPI+ objectives where these constraints are less influential</li> </ul>
2. Benchmark for performance assessment	Small	<ul style="list-style-type: none"> <li>• Super funds should be assessed on what they can control</li> <li>• Realised returns are dominated by what markets deliver (especially equity markets), including an unstable link to realised inflation</li> <li>• Fund investment decisions make a difference at the margin only</li> </ul>
3. Communicating expectations and assisting choice	Yes; although much room to improve	<ul style="list-style-type: none"> <li>• CPI+ objectives can inform members of real returns to expect</li> <li>• Can be used to reveal trade-offs if coupled with a risk measure</li> <li>• SRM is poorly coupled with CPI+ as too short-term, expressed in nominal terms, and does not inform of potential magnitude of loss</li> <li>• Ideally should be coupled with long-term shortfall risk measures</li> <li>• Inconsistencies in what is being presented to members both within and across super funds</li> </ul>
4. Meeting reporting requirements	Yes, but trivial	<ul style="list-style-type: none"> <li>• Real return targets need to be stated and reported against on ex-ante and ex-post bases for MySuper, as per regulatory requirements</li> <li>• Risk that the framing of CPI+ objectives is treated as a post-portfolio construction compliance activity, rather than being properly integrated into portfolio construction</li> </ul>
5. Marketing instrument	Hopefully not	<ul style="list-style-type: none"> <li>• Positioning the ‘promise’ to retain or attract members</li> <li>• Potential agency issue if funds hesitate to reduce their CPI+ objectives in accordance with a decreasing return opportunity set</li> </ul>

### 3.1 CPI+ as an objective to manage towards

As real returns are a primary determinant of member outcomes, at face value it might seem to make good sense for super funds to manage their investments towards maximising real returns subject to the risk of shortfall. Nevertheless, super funds face significant hurdles in effectively managing towards CPI+ objectives. These hurdles relate to a combination of limited control over eventual real return outcomes and a range of constraints on the ability to readily adjust portfolios to maximise the chance of achieving a CPI+ objective and minimise risk of shortfall.

- **Funds cannot control what markets will deliver** – Ultimately whether a portfolio meets a CPI+ objective will depend on what markets deliver, in particular growth assets and especially equities. In Section 6 we demonstrate that equity markets explain around 95% of the return variation for multi-asset growth options of super funds. Further, growth assets such as equities dominate the volatility and outcomes for most pre-mixed portfolios, even defensive portfolios with as little as 30% growth<sup>6</sup>. However, meaningful exposure to growth assets is justified – if not required – if expected consumption is to be maximised over the lifecycle (see Section 2) and to meet related stated CPI+ objectives over the long run. This is especially the case where the available returns in defensive assets fall far short of meeting the objective. For instance, consider a fund with a 70/30 growth/defensive mix with a long-term return target of CPI+3.5%. This objective cannot be achieved without taking some risk. ‘Low risk’ fixed income assets seem unlikely to deliver the target, noting that as at December 2024 the Reserve Bank of Australia (RBA) reported Australian 10-year inflation-linked bonds as yielding 1.98%, a cash rate of 4.35% and 10-year nominal government bond yields of 4.32% against a breakeven inflation rate of 2.34% and CPI inflation running at 2.4% headline and 3.2%-3.4% underlying in the year to December 2024. As soon as some risk is taken to achieve the objective, the portfolio becomes exposed to how risk-exposed assets perform. And super funds cannot control what the risk assets such as equity markets at large will ultimately deliver. Further, they have no control over the rate of inflation that feeds into the hurdle return that needs to be achieved.

- **Constraints on portfolio construction** – Effective management towards a CPI+ objective requires a capacity to make significant portfolio adjustments in response to variation in expected returns across assets. This is very difficult for super funds due to the presence of significant constraints that anchor their portfolios, thus limiting the scope to construct portfolios with the best chance of achieving or exceeding a CPI+ objective given the investment opportunity set that is available at any particular time. We discuss the constraints under three headings.

- **SAA** – Stated SAAs are quite influential in the management of multi-asset options, both as a consequence of the YFYS performance test being framed around SAA and undertakings made to members around the growth/defensive mix, asset weights and asset allocation ranges as stated within Product Disclosure Statements (PDSs). While some scope exists to deviate from the SAA or adjust it over time, the SAA nevertheless acts as a significant anchor for portfolio construction. This significantly hampers ability to dynamically manage CPI+ portfolios by adjusting the asset mix in response to changes in expected returns and risk<sup>7</sup>. For instance, if real cash rates were in excess of 5% or inflation-linked bonds offered real yields of 4%<sup>8</sup>, a 70/30 portfolio with CPI+3.5% objective might load up on fixed income given that the CPI+ objective is attainable without taking much risk<sup>9</sup>. Further, weightings might be increased substantially in whatever growth asset is ‘cheap’ and offers high expected real returns at any particular time, say because the asset has been sold off under cyclical stresses or due to the presence of forced sellers. Super funds would find it very difficult to

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<sup>6</sup> This is shown by Leibowitz and Bova in series of papers, e.g. Leibowitz and Bova (2005). Also see Section 6.

<sup>7</sup> For a discussion of dynamically changing asset allocation, see the following October 2024 report by Vanguard [“Time-varying asset allocation: Vanguard’s approach to dynamic portfolios”](#).

<sup>8</sup> Real yields were around these levels in the 1980s and 1990s.

<sup>9</sup> A practical issue with this hypothetical example is that the inflation-linked bond market does not offer the capacity to support large-scale allocations by the super industry.



dynamically manage a portfolio to take advantage of these opportunities other than in a modest way, for instance only changing or deviating from their stated SAA by a few percent<sup>10</sup>.

- **Presence of other objectives** – Super funds need to take other objectives into account that may be blind to the probability of achieving CPI+ objectives over the long run. The most important other objectives include avoiding a failure of the YFYS performance test and peer comparisons. Indeed, these other objectives appear to take priority over CPI+ objectives<sup>11</sup>. These institutional settings strongly nudge funds towards portfolios that tend to be focused on relative returns versus benchmarks and peers while being quite aware of ‘tracking error’ risk, which significantly limits the weight attached to CPI+ objectives. Another, albeit less influential, concern is limiting the risk of significant losses over shorter periods where possible. Setting out to ‘smooth the path’ recognises that members dislike reductions in their balance and may respond adversely to losses (e.g. going defensive after a market sell-off). It may also help manage sequencing risk, most notably in the retirement phase (discussed at the end Section 4.2). Managing towards these other objectives and risks can come at the cost of lowering expected long-term real returns.
- **Other portfolio constraints** – Both fee budgets and limits on illiquidity can further constrain the ability to pursue certain assets to any significant degree even if they may offer attractive real returns. There is considerable pressure on funds to restrict investment fees and ensure that they are not over-exposed to illiquid assets. For instance, it is difficult for super funds to hold a heavy exposure to alternative assets such as direct property, direct infrastructure and hedge funds, even if significant weightings would help further the likelihood of achieving a CPI+ objective.
- **Behavioural influences** – Possible implications for individual incentives (e.g. remuneration, career prospects) and reputation can be influential. For instance, super fund investment teams may balk at investments offering attractive long-term real returns that pose a risk of generating shorter-term underperformance for which they may be held accountable. Investment fads may create pressure to invest in spotlighted areas even if there are question marks over the long-term prospects.
- **Time horizon mismatch** – CPI+ should be seen as a long-term objective that is aligned with the idea of accumulating wealth over time. Ideally, it should be coupled with consideration for the risk of falling short of the objective over the long run. However, super funds can find it difficult to avoid focusing on short-term risk and return. First, both the relative return objectives and behavioural influences referred to above encourage taking a shorter-term view. Second, risk measures used in the industry tend to focus on shorter-term volatility, including the prevalence of a ‘modern portfolio theory’ risk toolkit (e.g. standard deviation, factor models), tracking error to the benchmark (e.g. SAA, YFYS test, peer returns) and drawdown risk. The consideration given to managing risk of shortfall versus a CPI+ objective over periods such as 10-years or longer is much diluted as a result. In addition, short-term performance can become the focus of attention from super fund boards, media and members, with potential implications for member attraction and retention.
- **Managing CPI risk can be problematic** – Managing towards a CPI+ objective requires considering the impact of inflation on real returns, in particular how various assets perform under high inflation environments. Directly managing CPI risk can be problematic because it may require deviating from existing SAA or increasing benchmark- or peer-relative risk. It may also indicate reducing exposure to higher returning assets (e.g. equity risk premia), in which case pursuing inflation protection may come at the cost of reducing long-term expected returns. (Section 7 discusses the management of inflation risk.) Again, super funds are generally not structured to address these issues in an effective manner.

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<sup>10</sup> A total portfolio approach (TPA) may better facilitate the constant re-assessment of return and risk, accounting for inflation-based scenarios. While some super funds have instigated TPA programs, these tend to introduce total portfolio framing to aspects like risk assessment and exposure management without casting off SAA as an anchor. [Wilkin-Smith \(Investment Magazine, 2022\)](#) discusses how super funds might incorporate TPA in a YFYS setting.

<sup>11</sup> Participants at the Conexus Fiduciary Investors Symposium in Victoria during October 2024 were asked to rank CPI+, YFYS test and peer relative objectives in order of priority. CPI+ was ranked first by only 26% of respondents, versus 41% for the YFYS test and 33% for peer relative. CPI+ was also ranked last by 59% of respondents.

## Contrasting against the Future Fund

It is worth contrasting against the approach of the **Future Fund** as a multi-asset fund that is specifically managed towards CPI+ outcomes. Notable features of the Future Fund's process include an overarching total portfolio approach (TPA), dynamic management of the portfolio, significantly lower listed equity exposure<sup>12</sup> than super funds with equivalent CPI+ objectives and significantly higher investment expenses<sup>13</sup>. Figure 3 highlights some of these features. The Future Fund delivered annualised returns of 8.2% over the 10 years to September 2024, outperforming its CPI-plus objective of 6.8% by 1.4%.

Figure 3: Future Fund asset allocation

<i>As at:</i>	Sep-14	Sep-19	Sep-24
Australian equities	9.0%	7.1%	10.9%
Global equities			
Developed markets	24.4%	19.2%	21.9%
Emerging markets	9.7%	10.0%	5.7%
<i>Total listed equities</i>	<i>43.1%</i>	<i>36.3%</i>	<i>38.5%</i>
Private equity	8.8%	15.8%	12.9%
Property	5.8%	6.7%	4.9%
Infrastructure & timberland	7.4%	7.1%	9.9%
Debt securities / credit	11.3%	9.0%	10.9%
Alternative assets	13.8%	13.7%	14.7%
Cash	9.8%	11.4%	8.2%
TOTAL	100%	100.0%	100.0%

Source: [Future Fund Portfolio Updates](#)

Nevertheless, framing around a CPI+ objective has the potential to be instructive at the **objective and SAA formulation stage**. The probability of attaining or exceeding the CPI+ objective against the risk of shortfall over a long horizon such as 10-years might provide the lens through which expected real returns and SAA are jointly determined, thus generating suitable pairings of CPI+ objectives and SAAs. As part of the process, SAA might be shaded towards favouring assets or asset mixes that achieve a suitable balance between a higher expected real return and the likelihood and magnitude of any shortfall over the long run. The identified SAA could then become the foundation for the YFYS test and the SAA and weighting ranges stated in the PDS. However, latitude to adopt this approach is constrained by the other influences as discussed above. In particular, the presence of other investment objectives works against placing the CPI+ /SAA pairing at the centre of objective and SAA formulation. Further discussion on objective formulation appears in Section 4.

## 3.2 CPI+ as a benchmark for performance assessment

While it may be informative to compare super fund performance against a CPI+ objective or real return target, it constitutes an inappropriate benchmark for assessment of whether a super fund has performed well or poorly. For instance, a CFA Society UK position paper describes CPI+ as a 'bad' objective due to not being actionable and the lack of any investible alternatives, and as purely aspirational (Bai-Marrow and Radia, 2017, p6). A core principle is that performance should be evaluated on aspects that are controllable by those being assessed. As discussed under Section 3.1, super funds have no control over what markets at large deliver. A broad-based sell-off such as that seen during the GFC could see all super funds fail to achieve their CPI-plus objectives; while an ongoing bull market of the type seen over more recent times may see every fund achieve its CPI+ objective – regardless of the value-add by management of the fund. At best, super funds can add (or detract) value at the margin around what markets deliver. However, any value added (or detracted) will likely constitute a minor portion of total return. In effect, beta exposures dominate the alpha profile of market-exposed funds. Further, super funds are highly constrained in the management of beta exposures for the reasons discussed in Section 3.1. In this context, APRA did not include a CPI-linked performance metric as one of multiple metrics in its Heatmap.

<sup>12</sup> The Future Fund tends to take much of its equity-like risk asset exposure in other ways, e.g. private equity.

<sup>13</sup> According to the Future Fund [Annual Report for 2022-23](#), 'look-through' costs (including all investment costs, including incentives fees paid to managers) were 2.22% in 2020-21, 1.01% in 2021-22 and 0.74% in 2022-23. These are considerably higher than super funds, bearing in mind that the Future Fund is essentially an investment organisation without members that pays zero tax.

Alternative approaches exist for assessing the value added by super fund management that help to take out the influence from broad market movements that the fund does not control. One approach (explored in Section 8.1.1) is to compare performance against an SRP that represents a low-cost alternative that the member could theoretically access themselves through passive vehicles. NZ Super is a good example of this approach<sup>14</sup>. Another possibility is to compare performance against peers with similar mandates. We suggested adding two tests along these lines in our submission to the Treasury's December 2023 consultation over the YFYS test (Bell and Warren, 2024).

It is worth noting that super funds may still be held to account by members for generating poor absolute returns, even if the source is broad-based weakness in financial markets over which the fund had little control. We comment in Section 8.1.1 on how including an SRP might help address this issue.

### 3.3 Communicating expectations and assisting investment choice

Perhaps the most useful purpose for CPI+ objectives is for communicating with members and assisting them to choose a suitable investment option. This purpose is more important where a member exercises choice of investment option. It is of lesser importance for MySuper (i.e. default) options where trustees are responsible for setting an investment strategy that they deem as appropriate for defaulting members. Even in the case of MySuper defaults, a CPI+ objective may still hold some value for members who are interested in an indication of the potential outcomes they can expect or purposely choose the default after comparing a range of investment options.

Expressing a CPI+ objective can inform members what returns they might expect from an investment option over the long run. It has been suggested to us that financial advisers use CPI+ objectives to help guide their members, who are often receptive to CPI+ framing<sup>15</sup>. While it can be helpful to frame investment choices with reference to CPI+ objectives, the real benefit arises if they are coupled with a high-quality risk measure that conveys the risk of failing to achieve the real return being targeted over the long run. Doing so advises the member about the trade-off between long-term expected return and risk, which can assist them to choose a suitable investment option given their risk-return preference<sup>16</sup>.

Use of CPI+ objectives as a device for communication and engagement has potential to be their most important function. Unfortunately, current industry practice falls short of realising the full potential for three reasons discussed below.

#### (a) SRM as the measure of risk

Members are currently presented with the SRM as the only measure of risk. The SRM indicates the number of years out of 20 that a negative return can be expected. There are three reasons why the SRM is a poor pairing with CPI+ objectives:

- The SRM reflects volatility over a shorter-term (i.e. 1-year) horizon rather than long-term risk of shortfall (be it either shortfall versus the objective or failure to maintain wealth);
- The SRM provides no indication of the potential magnitude of loss if there is a shortfall; and,
- The SRM is framed in nominal rather than real terms.

Better risk measures would focus on the *likelihood* and ideally also potential *magnitude* of shortfall versus a CPI+ target return over an extended period such as 10- or 20-years (and potentially also the *duration* of shortfall). Shifting the focus to shortfall risk over long horizons can have a significant impact as higher returning but more volatile assets increase the probability of achieving CPI+ objectives over long horizons through compounding, although they can also raise possibility of larger wealth losses in the lower tail (as discussed in Section 6). For instance, an investment in cash and other defensive assets

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<sup>14</sup> For background, see <https://nzsuperfund.nz/how-we-invest/reference-portfolio/>

<sup>15</sup> We thank Marisa Broome (financial adviser and previous Chair of the Financial Planning Association) for these observations.

<sup>16</sup> There is an argument that the trade-off is better revealed by presenting a CPI+ objective that aligns with the real return that the member can expect rather than a real return that is delivered to a certain level of confidence.

can decrease portfolio volatility and hence risk under the SRM, while increasing the probability of failing to achieve a CPI+ objective. Section 8 discusses the possibility of introducing a longer-term shortfall risk measure to sit alongside CPI+ objectives and the SRM.

### **(b) Inconsistency in what super funds report to their members**

A dichotomy exists between what super funds are required to report on their MySuper dashboards under the SIS Act and objective formulation under APRA Prudential Standard [SPS 530 Investment Governance in Superannuation](#). Funds are required under [Reporting Standard SRS 700.0](#) to report on their MySuper product dashboards a 'target return' that represents the real mean (i.e. expected) return for a representative member over 10-years after all costs. SPS 530 requires super funds to set specific and measurable return and risk objectives but provides no direction on the exact form they should take. See Actuaries Institute (2014) for discussion of the issues arising.

The problem is many funds formulate CPI+ objectives on a different basis to their MySuper return targets, including sometimes basing them around the likelihood of achieving the objective of (say) 60%-70%. The consequence is that members are being presented with differing versions of what may be interpreted as real return objectives in different settings. For instance, there is scope for differences between MySuper return targets and the stated CPI+ objective for MySuper funds, and against the stated objectives for the same balanced fund being made available as a choice option (see Section 5). Such inconsistencies inhibit the ability of members to compare investment options within the same fund.

### **(c) Lack of consistency across super funds**

In Section 5 we explore how real return targets (i.e. CPI+ objectives) appearing on MySuper dashboards line up against the SRM and growth asset exposure across a range of super funds. We find that there is limited consistency between the real return targets and these two risk proxies across funds. The analysis raises questions over the extent to which funds are employing different methods to estimate the objectives being presented to members. Such inconsistencies inhibit the ability of members to compare investment options across funds.

### **In summary**

CPI+ objectives have potential to play a useful role in communicating expectations to members and assisting them with choice. However, their pairing with the SRM as a risk measure and inconsistencies both within and across super funds reduces their effectiveness in playing this role.

## **3.4 Meeting reporting requirements**

As mentioned above, it is a regulatory requirement that super funds state real return targets (which may be interpreted as a CPI+ objective) and report performance against those targets for their MySuper options. Consequently, funds typically also state and report against CPI+ objectives more broadly, foremostly for their multi-asset funds. Viewed in isolation, this reporting purpose is trivial. However, there is a risk that the reporting requirements are viewed as a post-portfolio construction compliance activity, with investment options and underlying strategies determined and then CPI+ objectives modelled solely for reporting purposes. Ideally, the framing of CPI+ objectives would be integrated with portfolio construction in some way (see Section 4), including periodic reviews of SAA.

## **3.5 Marketing instrument**

From a more cynical perspective, CPI+ objectives could be used as a marketing tool. This would entail strategically reporting real return objectives or target with the intent of making the option appear more attractive with the aim of retaining or attracting members. The potential is enabled by the latitude super funds have to formulate their own objectives. This agency risk is amplified in a super fund context by disclosure mechanisms such as the MySuper dashboard, to the extent that members use these communications for choice of fund and options. Nevertheless, anecdotally we see little marketing of investment objectives and a greater focus on past performance.

## 4. Determining CPI+ objectives

We discuss the determination of CPI+ objectives in two parts. Section 4.1 outlines four possible approaches for setting CPI+ objectives. Section 4.2 discusses the modelling process, focusing on the question of whether CPI+ objectives should be based on static, ‘long-term average’ asset returns or modelled as time-varying to allow for changing market conditions (i.e. conditional modelling).

### 4.1 Approaches for setting CPI+ objectives

Figure 4 outlines four possible approaches for setting a CPI+ objective. The first three entail working from a particular baseline with a related motivation, including: (a) starting from a target real return that represents an assumed return that a super fund member needs or desires; (b) starting from a risk budget that the member is assumed willing to bear; or (c) starting with a portfolio structure that the fund intends to deliver. Approach (d) balances these three aspects in a fully integrated manner.

Figure 4 also describes the decision sequence implied by each approach. Approach (a) envisages a feedback loop between portfolio structure and risk in meeting the objective once the CPI+ return target is set. Approach (b) envisages a feedback loop between portfolio structure and the CPI+ return target under the constraint of a risk budget. Under approach (c), both the CPI+ return target and portfolio risk become outputs that arise as a consequence of the intended portfolio structure. Approach (d) would see portfolio structure, the CPI+ return target and portfolio risk being co-determined.

**Figure 4: Four approaches for determining CPI+ return targets**

Approach and Baseline	(a) Target real return	(b) Risk budget	(c) Portfolio structure	(d) Combination (fully integrated)
<b>Motivation</b>	Aim of delivering the real return that the member needs or desires	Anchor to level of risk that invested members are willing to bear	Based around portfolio structure that the fund intends to deliver	Arrive at a preferred balance between (a), (b) and (c)
<b>Decision sequence</b>	CPI+ return target ↓ Portfolio structure ↕ Portfolio risk	Risk budget ↓ Portfolio structure ↕ CPI+ return target	Portfolio structure ↓ CPI+ return target and portfolio risk	Portfolio structure ↕ CPI+ return target ↔ Portfolio risk

While we understand that many super funds regularly review their investment objectives and SAAs (e.g. yearly), we heard of various approaches during feedback. In any event, we suspect that other objectives such as peer comparison and the YFYS test are highly influential, making it less likely that a CPI+ objective would be determined in isolation by working downwards from risk/return preferences (i.e. as in approaches (a) or (b), or some combination).

The natural impact from the presence of other objectives would be to edge fund objective-setting towards (c), with a potential implication that setting the CPI+ objective is treated as a post-portfolio construction compliance activity. Feedback on an earlier draft of this report revealed that at least a few super funds adopt a version of approach (c), proceeding by identifying the ‘best portfolio possible’ and then circling back to frame up objectives including CPI+.

An element of the combination approach (d) could still be involved if the implications for portfolio construction of the implied CPI+ and risk objectives are considered as part of a process that balances a range of investment objectives and constructs the portfolio accordingly.

Other investor types not facing the same institutional settings may place greater weighting on other approaches. For instance, we suspect that the Future Fund and real return investment managers would lean more heavily into approach (a), or perhaps approach (d) where the risk objective is also central.

## 4.2 Modelling – Long-term averages or time-varying?

Portfolio modelling needs to be undertaken to facilitate estimation of CPI+ return targets, with some form of stochastic modelling required if risk is to be assessed and risk measures generated. The CPI+ return target itself would be modelled as a function of the proposed portfolio structure, expected asset returns and inflation expectations, except under approach (a) where the CPI+ return target provides the initial baseline. We do not intend to discuss how the modelling may be undertaken, which is a major topic in its own right. Rather, we address whether 'long-term average' estimates should be generated, or allowance should be made for CPI+ return targets and associated risk measures to vary over time in recognition of changing market conditions.

Modelling based on long-term averages for expected returns and risk offers a number of advantages. It generates stable estimates of expected real returns that can provide a reasonable representation of what a member may expect over the long term. This may suffice for the third purpose identified in Section 3 of communicating expectations and assisting with choice, noting that the primary function of CPI+ objectives under this purpose is to provide an indication of long-term expected returns and perhaps how they trade off against risk. Static CPI+ objectives also have the advantage of limiting the scope for the confusion that could occur if the objective was to change occasionally.

The problem with basing a CPI+ objective on long-term average expected returns is that the indicated ('promised') return and associated risk measures may move out of kilter with what is reasonably achievable, most notably when markets are priced for returns that deviate significantly from long-term averages. This might be particularly relevant where real interest rates deviate significantly from long-term averages, as this may relocate expected real returns across all assets. In such circumstances, a CPI+ objective and risk measures might be considered misleading. A good example is the zero-rate environment of post-COVID period when real interest rates were negative and most assets seemed priced for low expected returns relative to historical averages. Using long-term average expected returns during this period could have indicated a CPI+ objective that was misleadingly high. Probability of shortfall (including the SRM) could also be understated given that these measures partly depend on the level of expected returns. Mis-stating the CPI+ objective that is reasonably achievable can also heighten the existing issues with using CPI+ objectives under the first function of an objective to manage towards and the second function of a benchmark for assessment.

The alternative is to model the CPI+ objectives and related risk measures with reference to the expected returns available in the market, adjusting all metrics over time. For instance, expected returns could be formed by (say) using existing expected inflation as embedded in the market and policy interest rates as a baseline, and potentially a path for reversion back to long-term averages then traced out<sup>17</sup>. Risk premia could be added to arrive at expected returns on other asset classes. Another approach used by some investment organisations is to construct time-varying expected returns with reference to valuation ratios such as observed yields and P/E ratios<sup>18</sup>. Such approaches can generate more realistic CPI+ objectives and related risk measures, supporting communication of realistic expectations and provide a more appropriate baseline for portfolio construction and performance benchmarking. Issues with conditional modelling include the possibility that adjusting the CPI+ objective over time could confuse members, and that it is difficult to undertake and can be quite subjective in its application.

*Investment horizon* is also relevant for the suitability of long-term average versus conditional expected returns. To the extent that any deviations from long-term average real returns are often corrected over the short-medium term (especially if markets mean-revert), the value of conditional modelling will diminish with horizon. For a young member with a low balance, the most relevant consideration is the return they receive on future contributions rather than return on their current balance. In this case, long-term average returns may be more relevant. The opposite applies for members who are nearing or in retirement, for who conditional returns may be more relevant due to the potential impact of sequence-of-return effects (discussed at end of Section 6.2).

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<sup>17</sup> This will result in expected returns varying with horizon.

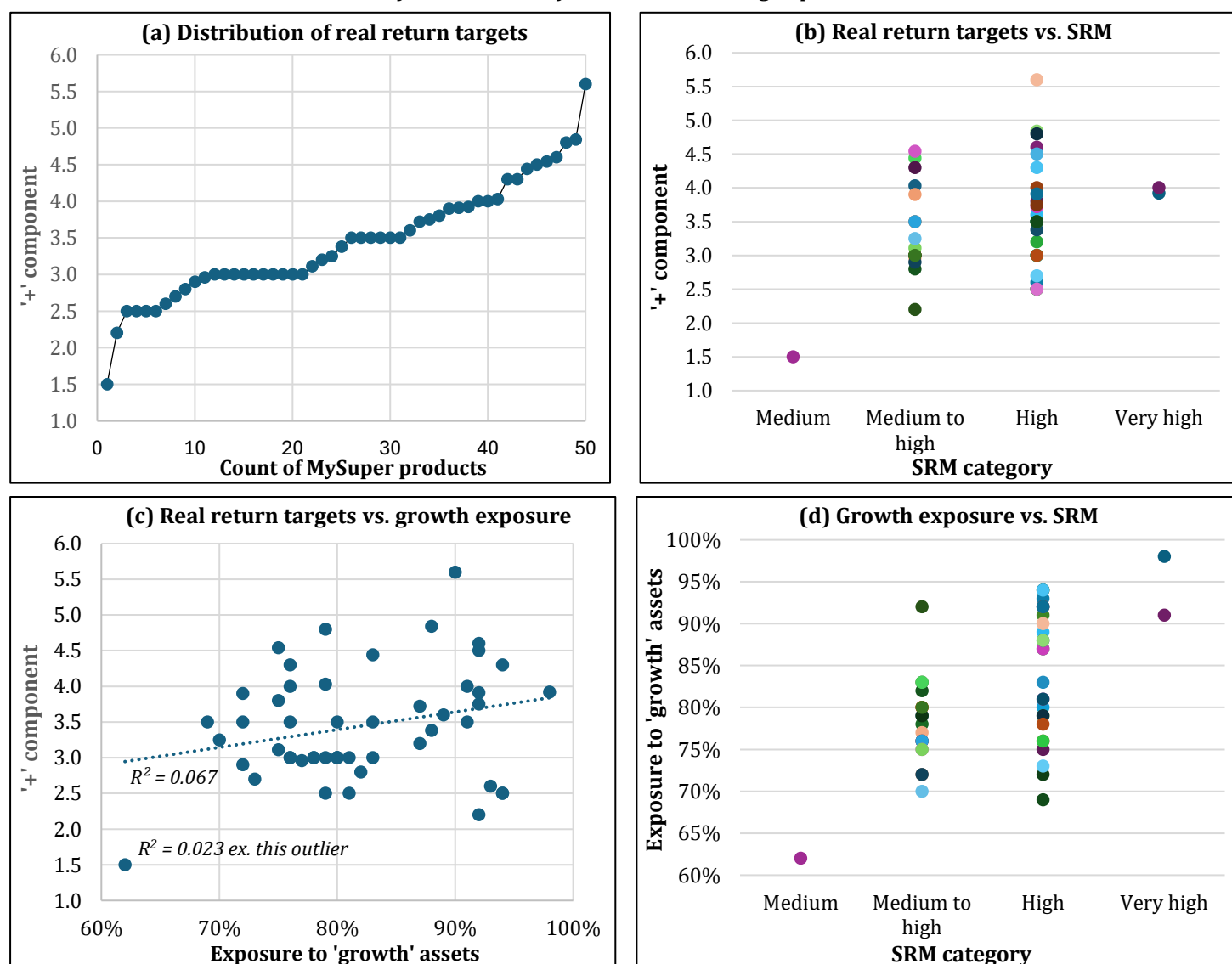
<sup>18</sup> Examples include [Research Affiliates](#), [AQR](#) and [Vanguard](#).

## 5. How CPI+ objectives are being disclosed by super funds

We now examine the disclosure of CPI+ objectives based on data sourced from APRA and super fund websites. Our initial focus is the range of 10-year real return targets for MySuper products and how they relate to the stated SRM and growth/defensive mix under the option's SAA. For lifecycle options, we record objectives for the earliest lifecycle stage offered to younger members, which is typically a high growth fund. We find a substantial (and disturbing) degree of variation in CPI+ objectives stated as real return targets with limited consistency against the SRM or growth/defensive mix.

Figure 5 presents the findings. Figure 5(a) plots the *distribution of the '+' component*. Even though the MySuper products examined are default options intended for the 'typical' member saving for retirement, the real return targets are quite dispersed with a range from CPI+1.5% to CPI+5.6% around an average of CPI+3.44%. For comparison, the Future Fund's investment mandate since July 2017 has been to achieve an average annual return of at least the CPI plus 4% to 5% per annum over the long term.

**Figure 5: MySuper product 10-year real return targets**  
 Collected from APRA and fund websites during September 2024



We explore the relation with portfolio risk from two perspectives. Figure 5(b) compares real return targets against *SRM labelling* (while noting our concerns around SRM expressed in Section 3.3). Although a clear positive relation exists between SRM risk labels and CPI+ objectives, the relation is modest and the ranges within each SRM category are disturbingly wide. The ranges are also quite overlapping so there is no clear risk/return delineation across SRM categories. For instance, choosing a

product in the medium-high SRM category may come with a communication to expect a real return of anywhere between 2.2% and 4.5%; while products in the high SRM category are communicating to expect real returns of between 2.5% and 5.6%. Figure 5(c) compares real return targets versus level of *growth asset exposure*, as reported by APRA in their Heatmaps. Growth exposure for our sample ranges from 62% to 98%, with an average of 82%. The relation between real return targets and the level of growth asset exposure is weak, with only 6.7% of the variation explained by reported growth exposure (and only 2.3% removing an outlier). Within the range of 70%-80% growth exposure – as typical for many MySuper balanced funds – we observe a real return target range of between 2.5% and 4.8%! Figure 5(d) completes the picture by plotting *growth asset exposure against SRM labelling*. Again, while there is a broadly positive relation, the degree of variation across SRM categories is disconcerting.

We also compared real return targets on MySuper dashboards with CPI+ objectives as stated in the PDSs of 12 funds and found that they differed for six out of the twelve. In four of these cases the CPI+ objective was less than the stated return target, which might be explained by the CPI+ objective being determined by applying of a confidence level such as 60%-70%. We also noted that one fund had aligned the CPI+ objective and return target for their MySuper option, but had stated a different (lower) CPI+ objective for their balanced fund option although the same underlying fund was used as for MySuper.

For comparison, the Future Fund does not have a formal risk label, but their stated objective is accompanied with the by-line “*with an acceptable but not excessive level of risk*”. The Future Fund does not report growth exposure, but does report an internal risk measure known as EEE (Equity Equivalent Exposure) that is similar to a measure of portfolio beta to equity markets. Recent reports<sup>19</sup> place this number at around 60%. The regression of average growth fund returns on Australian and international stock option returns (as presented Section 6.2) suggests a comparable equity market beta of 0.60 over 1-years and 0.65 over 3-year rolling periods for ‘balanced’ growth options<sup>20</sup>.

## Why the differences?

It is interesting to consider what motivates the substantial differences in the ‘+’ component of the CPI+ objectives and return targets both across and within super funds, as well as a weak relation with the risk proxies. There is a variety of potential explanations, some of which may include:

- Variation in the ‘+’ component could reflect different risk profiles adopted by trustees on behalf of MySuper members.
- Differences may exist in capital market forecasts and alpha assumptions, including whether long-term average or conditional expected returns are used. In the latter case, there is scope for conditional forecasts to be formulated in a wide number of ways.
- Modelling methods may differ, and hence how the measures are generated and calculated.
- We wonder whether some super funds may have used their CPI+ objectives struck at a 60%-70% confidence level on their MySuper dashboards, either inadvertently or in order to report consistent objectives to members, even though this would contravene the requirements.
- Strategic positioning of the real return target for marketing purposes (as per the fifth purpose in Section 3.5) might be at play, with some funds aiming to present their objectives in a positive light.
- There could be variation in the way that funds are interpreting the regulatory requirements.

The data we collected leaves the distinct impression that super fund objective setting is something of a dog’s breakfast, rather than an exercise in consistent modelling and framing across the industry. We raise the question of whether greater standardisation would be beneficial in Section 8.4.

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<sup>19</sup> <https://yearinreviewfy24.futurefund.gov.au/FY24-Year-in-Review.pdf>

<sup>20</sup> It was suggested during feedback that this may underestimate the EEE of super fund balanced growth options.



## 6. Constructing multi-asset portfolios under CPI+ objectives

Constructing multi-asset portfolios to achieve a CPI+ objective calls for balancing the probability of achieving or exceeding a real return target against the risk of shortfall. We describe the nature of this trade-off, and the central role played by having exposure to assets that offer sufficient expected returns to achieve the target. Section 7 considers asset selection under CPI+ objectives.

Our discussions focus on the link between broad portfolio design and asset selection towards achieving CPI+ objectives. There are other aspects that can assist in achieving CPI+ (and other) portfolio objectives that we do not address, including; diversification; effective governance, investment models and implementation; and directing investment activities towards exploiting any comparative advantage.

### 6.1 Relation between the ‘+’ component, portfolio construction and risk

The ‘+’ component of a CPI+ objective dictates the trade-off between greater potential wealth accumulation and risk, which in turn should inform portfolio construction. Targeting a larger ‘+’ component implies an *expectation* of accumulating more real wealth by compounding at a higher real rate of return, which in turn can support higher income in retirement. Figure 6 provides an indication of the impact on expected member outcomes of targeting different ‘+’ components. For example, the projected difference between pursuing a CPI+4.5% versus a CPI+1.5% objective is a doubling of the expected balance at retirement and expecting to sustain income based on a 70% replacement rate of pre-retirement income to age 111 versus only age 75. Although this example is grossly simplified<sup>21</sup> and deterministic, it serves to illustrate the power of compounding over long horizons.

**Figure 6: Expected outcomes and target real returns**  
*Individual with income of \$50,000 making 12% contributions*

CPI+ objective	Projected real balance at retirement (age 65)	Projected age to which a 70% income replacement rate is sustainable
1.5%	336,491	75
2.5%	420,526	79
3.5%	531,057	87
4.5%	677,080	111

Risk is also relevant. Pursuing a larger ‘+’ component implies constructing a portfolio with greater exposure to assets that offer higher expected returns, which in turn are likely to be higher risk assets. We examine the nature of risk in Section 6.2. For now, we note that setting a higher real return target and investing accordingly should deliver a higher *probability* of generating better outcomes over long horizons, but also raises the potential for losses of a larger *magnitude* while heightening exposure to shorter-term return volatility as well as sequencing risk. While it makes sense for super fund investors to invest in options with a larger CPI+ objective given the long horizons involved, the ‘+’ component that is appropriate for any individual will ultimately depend on their tolerance to accept the associated risks which accompany the pursuit of higher expected real returns.

### 6.2 Implications for risk and portfolio construction

Achieving a CPI+ objective with a sizable ‘+’ component requires being exposed to assets that can deliver sufficient returns. This typically necessitates having ample exposure to growth assets such as equities that offer higher expected returns, except in the (unlikely) event that low-risk assets are priced for real returns that suffice to reach the targeted real return. The nature of risk defined as shortfall relative to a

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<sup>21</sup> The analysis assumes real income of \$50,000 and spending of \$44,000 pre-retirement and then real income and spending of \$35,000 post-retirement, with the latter funded from the member’s balance (i.e. no Age Pension).

CPI+ objective over a long horizon differs from the more familiar understanding of risk as return volatility. Characterising shortfall risk requires focusing on the distribution of *wealth* and how it evolves over time, rather than the distribution of returns.

Risk for long-term investors is discussed in Warren (2021), which notes that investing in riskier assets offering higher expected returns results in the following:

- (a) *Higher **probability** of greater wealth accumulation that in turn increases with horizon.* Indeed, over very long horizons it becomes highly likely that a riskier asset will deliver more wealth than a less risky asset offering lower expected returns.
- (b) *Higher **probability** of exceeding a real return target that also increases with horizon,* provided that the expected return exceeds the target. Meanwhile, an asset offering real expected returns less than the target will have a higher probability of falling short of the target that also increases with horizon.
- (c) *The **potential for wealth losses of greater magnitude** typically<sup>22</sup> increase with horizon.* In effect, this means that there always exists some chance of particularly bad outcomes from riskier assets in the lower part of the wealth distribution relative to less risky assets, i.e. there is a larger tail risk.

The effects listed above are illustrated in Figure 7 and Figure 8 (see over), which are drawn from Warren (2021). Figure 7 projects expected wealth paths for equities, 10-year bonds and cash (1-year bonds) compared to the wealth path required to achieve a CPI+3.5% objective over a 50-year horizon, assuming compound expected real returns are 6.0% for equities<sup>23</sup>, 1.7% for 10-year bonds and 1.0% for cash. Figure 8 plots percentiles for wealth paths from equities and fixed income relative to the CPI+3.5% target as formed under simulation analysis<sup>24</sup>. In Figure 8, the horizontal axis represents attainment of the CPI+ objective, with the area above (below) representing an excess (shortfall) relative to the target.

First note that the gaps between expected wealth arising from each asset relative to the CPI+3.5% target seen in Figure 7 grow over time due to compounding, implying that expected outcomes diverge from the target as horizon increases. This illustrates the potential benefit (detriment) from investing in assets offering an expected return that is higher (lower) than the target as the horizon grows. Figure 8 may be interpreted as confidence intervals for real accumulated wealth relative to a CPI+3.5% target return and how these intervals evolve with horizon. Figure 8 demonstrates that the probability of a better outcome from equities increases with horizon. Meanwhile, the probability of fixed income failing to achieve the CPI+3.5% target (represented by falling below the horizontal axis) is both higher and increasing with horizon, with a 99% chance of failing to meet the objective beyond year 25. These observations accord with points (a) and (b) above. For another perspective, we estimated the probability of failing to achieve the CPI+3.5% target over 10 years at 34% for equities and 92% for fixed income. This implies a probability of achieving or exceeding the target of 66% and 8% respectively.

Nevertheless, equities always have some possibility of generating a worse wealth outcome than fixed income in the lower tail (e.g. compare the 1% lines). This accords with point (c). The probabilities of stocks underperforming fixed income over long horizons seem higher when actual data is used that captures the 'fat tails'. For instance, McQuarrie (2024) examines the relative performance of equities versus bonds across global markets from 1793 to 2019. He finds that equities underperformed bonds in about a third of 30-year rolling periods over the full sample period of 1793-2019 but only 1.3% since 1942<sup>25</sup>, and that relative performance is regime-dependent. Examples of developments that might have a major and sustained real negative impact on equity markets include an event that kills a large portion of the global population, a hot war involving nuclear deployment, severe impacts from climate change that require very costly mitigation action, social change that inspires mobilisation against the corporate

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<sup>22</sup> This may not be the case under mean reversion, i.e. serial correlation matters.

<sup>23</sup> Compound equity returns of 6% equate to arithmetic mean returns of about 7.5% at volatility of 17½% p.a.

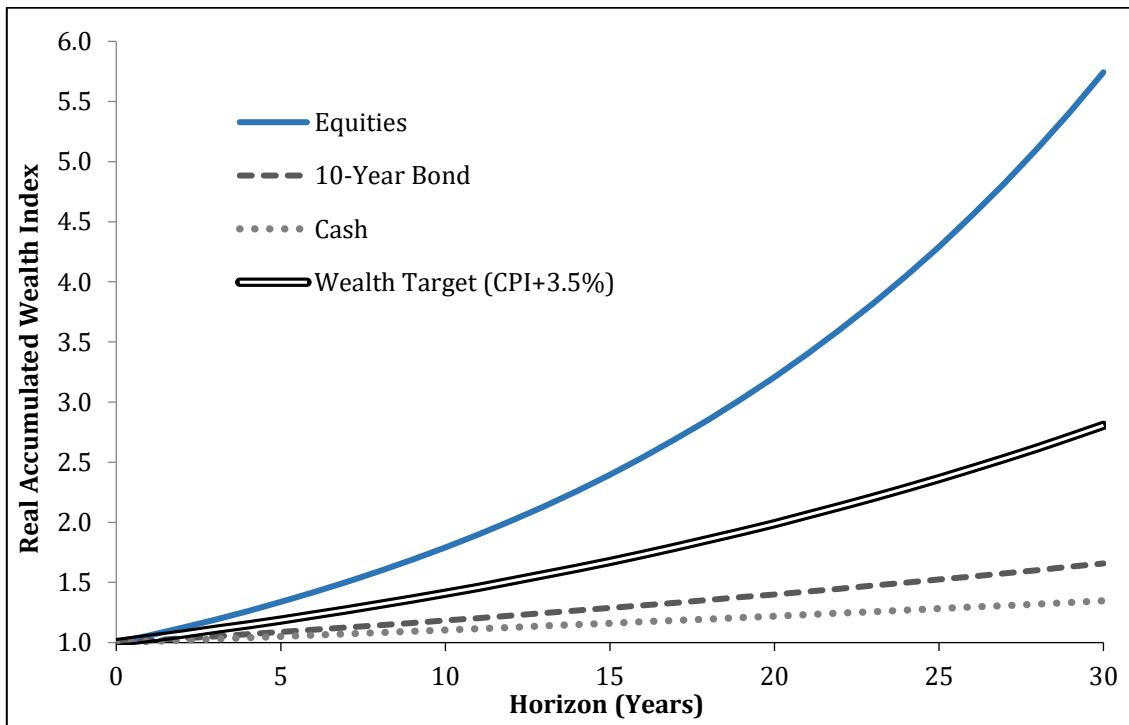
<sup>24</sup> The series are based on 10,000 simulations where equities and fixed income follow lognormal distributions with a mean (standard deviation) of 6.0% (18%) and 1.5% (4.5%) respectively.

<sup>25</sup> For 10-year rolling periods, McQuarrie (2024) finds that equities underperform 36% of the time over the full sample, and 17% of the time since 1942.

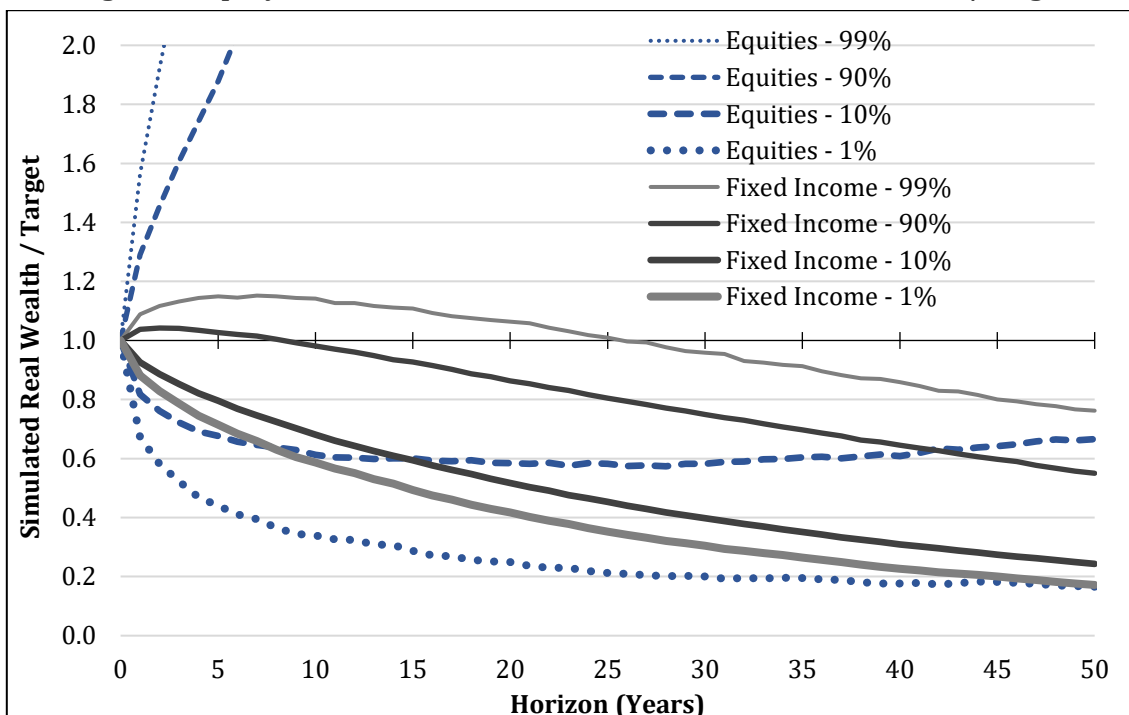
sector, a breakdown in world trade, a global depression due to a policy error, sustained high inflation perhaps due to debt monetisation, and debt default by a major nation. While these are all low probability events, they cannot be totally ruled out.

In sum, while fixed income offers less variable wealth outcomes, it becomes increasingly more probable of falling short of equities and failing to achieve the CPI+3.5% target as horizon increases. Nevertheless, there is no free lunch. Equities always have some chance of delivering a worse performance, even over long horizons. This notion highlights the importance of considering the potential magnitude of shortfall as well as the likelihood of shortfall in order to complete the risk picture when managing towards CPI+ objectives over long horizons.

**Figure 7: Expected accumulated real wealth vs. CPI+3.5% objective**

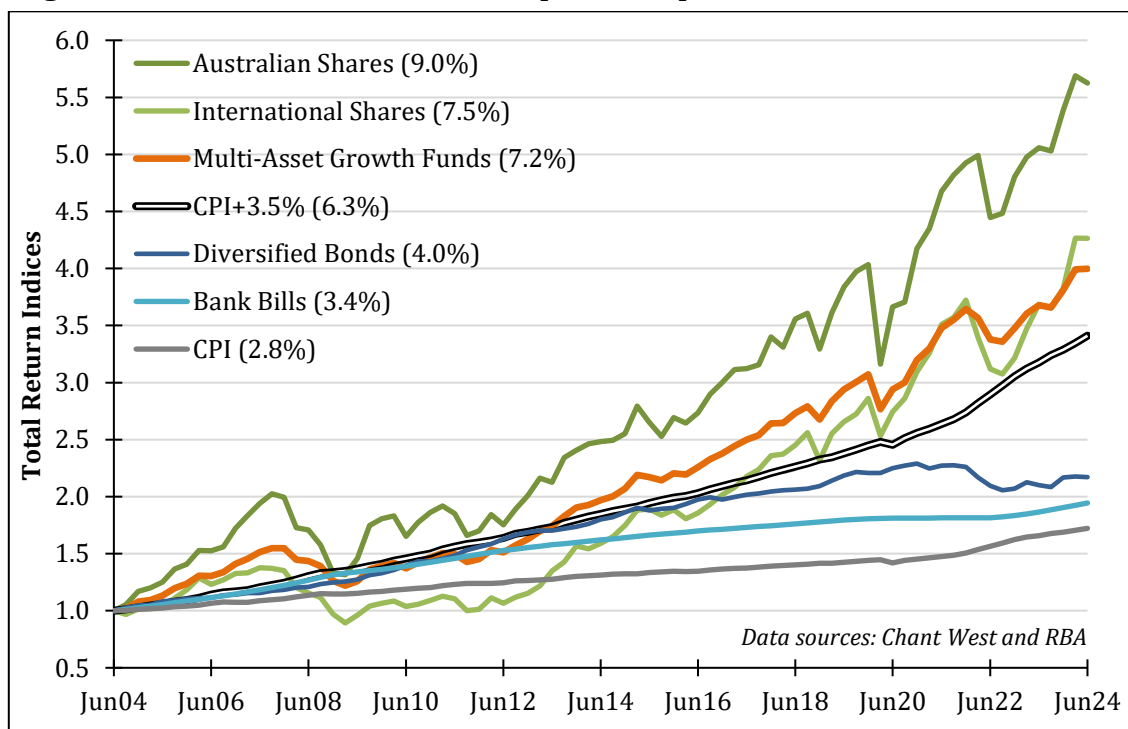


**Figure 8: Equity vs. fixed income: Confidence intervals around wealth / target**



We use return data for super fund options sourced from Chant West<sup>26</sup> to demonstrate that something similar to these hypothetical projections have played out over the last 20-years. Figure 9 plots cumulative total net return indices for multi-asset growth funds<sup>27</sup>, Australian shares (i.e. equities), international shares and diversified bonds, a cash proxy, inflation as measured by the Australian CPI and CPI+3.5%. To form these series, we average net returns across all super fund options available at the end of each quarter<sup>28</sup>, and then accumulate the averages to form total net return indices. The multi-asset growth options represent balanced funds<sup>29</sup> that are used in MySuper defaults or their predecessors, which would typically have a growth weight in the order of 60%-80%. The cash return index is formed by accumulating yields on 90-day bank yields observed at the beginning of the quarter after adjusting for a 15% tax rate. Cumulative per annum returns for each series are reported within the legend. The return indices should be considered illustrative rather than precise, while the annualised returns and the positioning of each line reflects the particular analysis period. Over this period, our sample of multi-asset growth options delivered a cumulative return of 7.2% per annum, comfortably exceeding the return of 6.3% required to achieve CPI+3.5%. However, this is largely due to exposure to equities, which have outperformed the 3.5% real return target. Meanwhile, exposure to fixed income was a drag on performance versus target. While only a single snapshot of history over a relatively short period, Figure 9 nevertheless looks something like Figure 7 in motion.

**Figure 9: Accumulated net returns – Super fund options vs. cash, CPI and CPI+3.5%**



The key insight to draw from Figure 9 is that the average growth fund exceeded the CPI+3.5% objective largely as a consequence of exposure to shares (and potentially other growth assets<sup>30</sup>). Meanwhile, although fixed income assets were a drag on performance they would have contributed to a lowering of

<sup>26</sup> We thank Chant West for supplying the data.

<sup>27</sup> For this analysis, we focus on multi-asset growth options to maintain some consistency in growth and hence risk exposure given that we are examining return series. Analysis in Section 4 was based on a broader range of options.

<sup>28</sup> Sample sizes increase over time from 12 up to 24 options for growth and Australian shares, 10 up to 20 options for international stocks and 10 up to 17 options for diversified bonds. funds

<sup>29</sup> Funds supplying lifecycle options are excluded.

<sup>30</sup> Diversified property options delivered 6.1%, which is marginally lower than CPI-plus. Chant West has data on only three options on listed international infrastructure, and these delivered cumulative returns of 10.4% over the 14-years to June 2024.

volatility. For example, the standard deviation of rolling yearly returns was 8.0% for the multi-asset growth funds, versus 14.2% and 13.2% for Australian and international shares<sup>31</sup>, respectively.

Figure 10 converts the total return series for growth funds, CPI and CPI+3.5% as plotted in Figure 9 into annualised changes over rolling 3-year and 10-year periods. It demonstrates that pursuing a CPI+ target through constructing a portfolio with exposure to higher returning assets can lead to periods of shortfall versus the objective, and that the risk of shortfall is higher over shorter time frames. For this particular period, failure to attain the CPI+3.5% occurred over 36% of the rolling 3-year periods and 24% of the rolling 10-year periods<sup>32</sup>. Further, a larger magnitude of shortfall is evident over 3-years than 10-years. These findings are broadly consistent with the simulation results presented in Figure 8.

**Figure 10: Growth fund returns vs. CPI and CPI+3.5% - Changes over 3-years and 10-years**

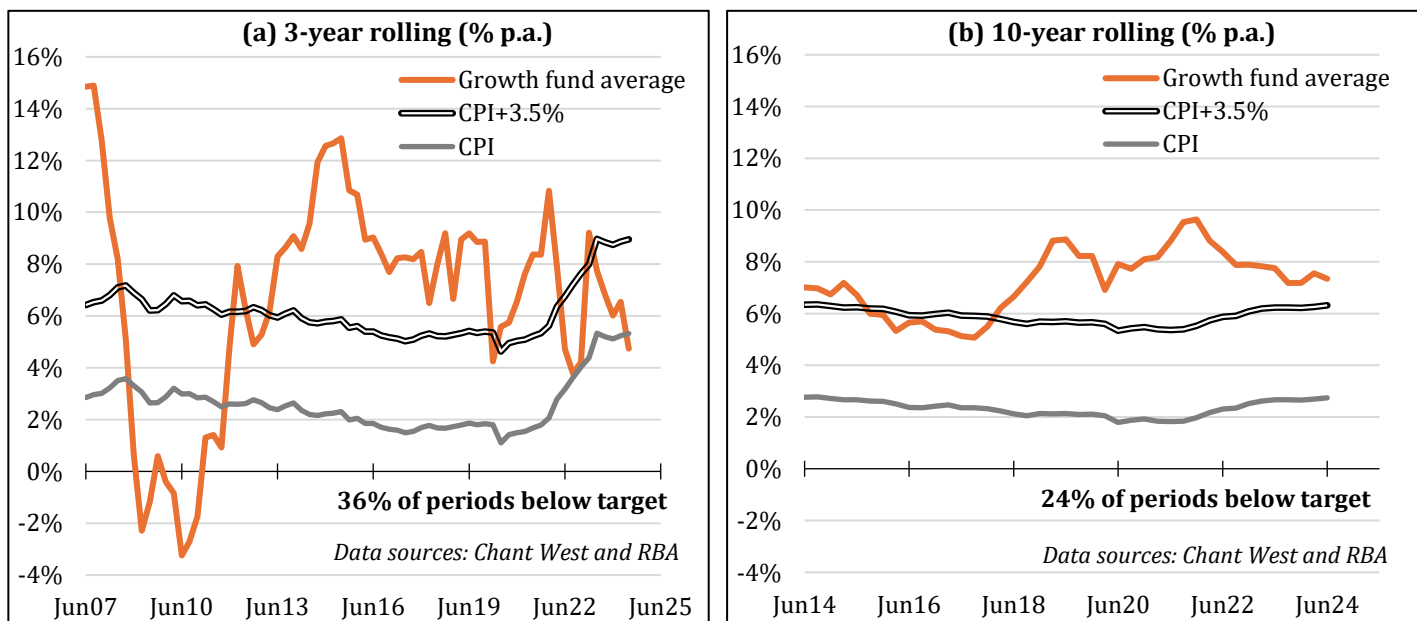


Figure 11 confirms the dominance of equities as a primary source of the observed return fluctuations by converting the series plotted in Figure 9 into rolling 3-year real returns and comparing growth funds against a simple average of returns on the Australian shares and international shares options. The chart visually illustrates the importance of equity markets to the returns delivered by multi-asset funds. Conducting regressions of growth fund returns on those for Australian shares and international shares reveals that 95% of the variation in rolling 1-year returns and 96% of 3-year returns for the multi-asset growth options are explained by equities<sup>33</sup>. The two equity return series also explain 94% of rolling 1-year returns for multi-asset balanced options and 81% for conservative options<sup>34</sup>. This reinforces that equities remain a dominant influence even for multi-asset portfolios with relative low growth exposure, as argued by Leibowitz and Bova (2005).

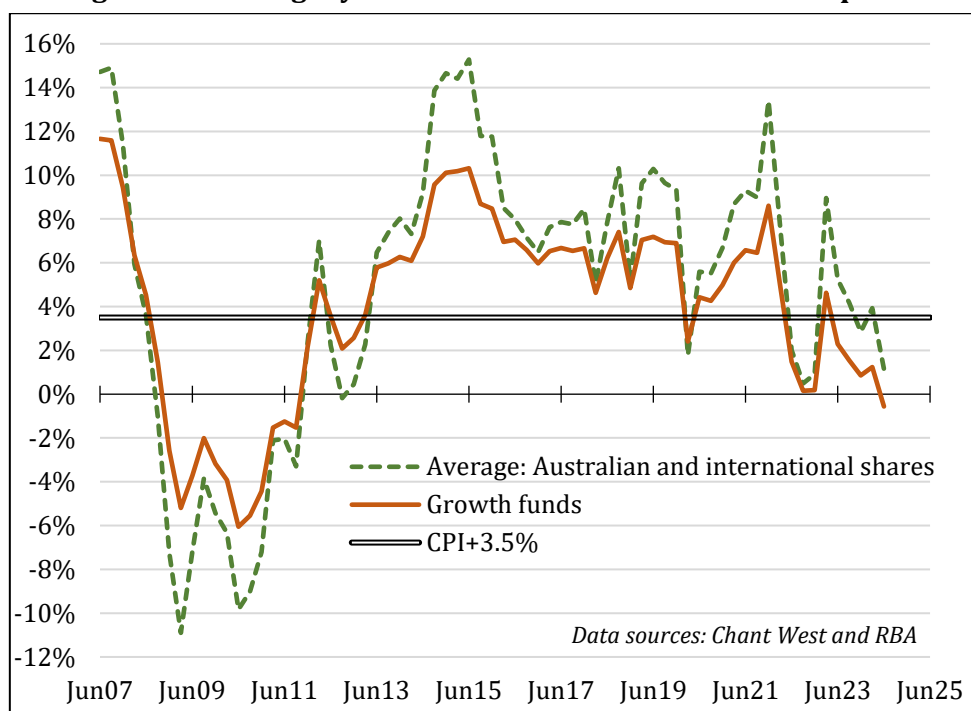
<sup>31</sup> Unhedged international shares may benefit from volatility reduction stemming from a positive correlation with the A\$, such that losses (gains) on international shares tend to be offset by gains (losses) on the associated foreign currency exposure.

<sup>32</sup> Extending the series further back by adding funds with lifecycle options (per Section 5) finds that CPI+3.5% was not met 37% of the time over rolling 10-year periods. However, these estimates reflect a less consistent fund sample and should be viewed as only broadly indicative.

<sup>33</sup> The Australian shares and international shares series individually respectively explain 87% and 84% of 1-year returns. The two series have a correlation of 0.81.

<sup>34</sup> These estimates broadly accord with those of Leibowitz and Bova (2005).

**Figure 11: Rolling 3-year real returns: Growth funds vs. equities**



The key message is that achieving a higher CPI+ objective requires increasing exposure to higher-returning growth assets, which by necessity will likely necessitate holding equities or assets carrying equity-like exposure. However, this brings exposure to equity-related risk, including higher volatility and an increase in the possibility that the CPI+ objective will not be achieved over shorter time horizons.

## Sequencing risk

Sequencing risk might be considered an *interaction effect* between investment risk and portfolio cash flows. The notion behind sequencing risk is that, for a given series of returns (and hence holding risk constant), the sequence in which those returns are experienced matters. However, this only occurs where cash flows are involved: The sequence of returns is irrelevant for a portfolio experiencing no cash flows over the investment period. When cash flows are involved, it is more detrimental to incur lower returns after all cash inflows have been invested and the portfolio is potentially around peak asset value and about to enter a drawdown phase<sup>35</sup>. In superannuation, the exposure to sequencing risk is greatest nearing and in retirement<sup>36</sup>. In essence, it is preferable to earn relatively high returns later in accumulation and earlier in retirement, than earlier in accumulation<sup>37</sup> and later in retirement. Sequencing risk might be viewed as *amplifying the effects of return variability* for portfolios that incur cash flows, rather than a standalone risk in its own right.

In a superannuation context where there are contributions and drawdowns, pursuing a higher CPI+ objective boosts exposure to this interaction effect as a consequence of the need for greater exposure to riskier assets to meet the target. One implication is that shorter-term investment risk – in particular the potential for large portfolio drawdowns that are sustained for some period of time – becomes more relevant when managing portfolios for members that are near, or early in, retirement.

Conexus Institute's [retirement explainer #10](#) provides an in-depth discussion of sequencing risk.

<sup>35</sup> Another perspective is that cash flows drive a wedge between time-weighted and asset-weighted returns.

<sup>36</sup> Sequencing risk around the point of retirement is exacerbated if a lump sum is taken upon retiring, perhaps to support immediate spending (e.g. home renovations), debt repayment or annuity purchase.

<sup>37</sup> Indeed, in the accumulation phase it can be detrimental to incur higher returns that lead to expensive asset markets offering lower expected returns looking forward as subsequent contributions are more likely to generate low returns. A young investor may be better off with initially poor return if they afford the opportunity to buy assets cheaply.

## 6.3 Managing shortfall risk under CPI+ objectives

We now highlight situations that may lead to multi-asset portfolios falling short of CPI+ objectives over the long-term, and then discuss how portfolios could be structured to manage this shortfall risk.

- **Situation #1: Investing too defensively** – The discussion above highlights the need to structure the portfolio for an expected return that is sufficient to achieve a CPI+ objective to a reasonable probability, which in turn most likely requires significant exposure to ‘risky’ assets. One approach to managing this risk could be to hold exposure to higher-returning assets up to the limit of the risk tolerance of members who are likely to invest in option, thus keeping exposure to defensive assets offering expected returns below the target to a minimum. Risk tolerance of members is difficult to establish, meaning that judgment needs to be exercised. Considerations might include: assumptions about the capacity of members to endure tail events that lead to significant losses over the long run; capacity of members to endure short-term volatility in their account balance; and whether sequencing effects are at play. Educational and communications-based activities might also help bridge any gap between risk capacity and risk tolerance (where the former exceeds the latter), in order to encourage members to accept a level of risk exposure that is suitable for their circumstances.
- **Situation #2: Insufficient expected returns are on offer** – Portfolios may struggle to achieve CPI+ objectives where expected returns on offer are so low that the target is unlikely to be achieved or can only be attained through ramping up risk to an unacceptable level<sup>38</sup>. The circumstance where this might occur is where discount rates and hence expected returns are extremely low across all markets, i.e. everything is expensive. Shades of such an environment were evident during the period of zero-rate policies following COVID, although this situation has now been at least partially corrected with the rise in interest rates and the adjustments in most markets that occurred during 2022<sup>39</sup>. Such situations call for a focus on managing the expected shortfall versus a CPI+ objective. Consideration might also be given to reducing the CPI+ target objective itself to an achievable level (see Section 4.2), or perhaps communicating a lower chance of the objective being achieved.
- **Situation #3: Developments that result in sustained wealth losses** – The key concern when investing for the long term is not volatility *per se*, but rather the risk of loss in real wealth that is sustained through to the end of the investment horizon and thus never recouped. (This might be considered a reframing of the concept of ‘permanent loss of capital’ to bring the investment horizon into sharper focus.) Three situations that might lead to substantial loss of real wealth over longer horizons include:
  - a) *Exposure to assets where cash flows dislocate downwards, resulting in a permanent downward adjustment in asset prices.* Examples might include an event that causes a major reduction in corporate profitability (such as a sustained reduction in the profit share or margins, or a major tax hike), or widespread economic damage from climate change or a major geopolitical event.
  - b) *Mean reversion in valuation multiples that impairs returns over the horizon of interest.* For instance, the P/E ratio on the S&P500 declined from 29.7x in 1999 back to its historical average of 15.8x in July 2010, contributing to the S&P500 CPI-adjusted total return index declining by 29% over the period. Correction in valuations was also a significant contributor to the sustained decline in Japanese equities after 1990. Valuation risk is greatest where markets have formed a bubble. This risk becomes less important as horizon lengthens and the influence of initial valuations wane.
  - c) *Sustained high inflation or hyperinflation that is not offset by asset price appreciation.* Both equities and bonds can tend to struggle under very high inflation, aided by the fact that high inflation can

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<sup>38</sup> Time frame plays a role here, as starting market conditions tend to be less important as the investing horizon lengthens. This is especially the case where future contributions are expected, and there is a reasonable chance that markets may adjust in the interim so that those contributions may be invested at a higher expected return.

<sup>39</sup> For instance, based on data from the [St Louis Fed](#), US 10-year real bond (i.e. TIPS) yields moved from negative territory during much of 2020 and 2021 to around 1.5%-2% in period from late-2022. The MSCI ACWI Index returned -18% over 2022, amounting to a real return of around -25% in US\$ terms.

damage economies. The 1970s is a good example. High inflation naturally makes a CPI+ objective more difficult to achieve by raising the nominal return hurdle. We discuss the addressing of inflation risk in Section 7.

The implication for portfolio construction is to be aware of, and limit exposure to, situations where there is high potential for sustained real wealth losses such as those highlighted above. These situations can often be difficult to manage as they can require significant changes to the portfolio that may run counter to other objectives, especially relative return objectives such as the YFYS performance test and peer comparisons. They nevertheless might influence portfolio construction at the margin, operating within the latitude provided by other objectives and constraints.

## 6.4 Should portfolios with CPI+ objectives be managed dynamically?

We see value in CPI+ portfolios being managed dynamically, in particular by responding to changes in expected returns across assets and an evaluation of associated risk. Both the probability of achieving and the risk of shortfall versus a CPI+ objective may be better addressed by recognising that the market opportunity set is in constant flux. The opportunity to achieve better outcomes from dynamic management takes two forms:

- (i) Constant reassessment of the distribution of expected returns and risk across assets as it changes over time and adjusting the portfolio accordingly. This essentially involves rotating from less attractive investments into more attractive opportunities. For instance, weights in assets that underperform due to a decline in valuation multiples (i.e. higher discount rates) would be increased.
- (ii) Monitoring for specific risks to the outlook for inflation and re-considering portfolio construction and the degree and form of any CPI protection in this light.

While constant reassessment generally applies to any portfolio, the lens through which changes in the opportunity set and the preferred response can differ under a CPI+ objective relative to other objectives. In particular, under benchmark-relative or peer-relative objectives, changes in expected returns would be viewed against the implications for relative return (i.e. tracking error) risk, rather than the risk of shortfall versus a real return target. The presence of these relative return objectives makes the opportunities afforded by dynamic management much harder to access for super funds.

For other CPI+ investor types – such as the Future Fund, endowments and foundations and the real return funds of investment managers – we identify far more dynamic management behaviour (without entering into the debate over whether this has resulted in better outcomes). Such investors may also be more able to effectively implement TPA, which is more amenable to dynamically managing towards a CPI+ objective than under anchoring to a particular SAA.



## 7. Asset selection under CPI+ objectives

We focus on three ways in which individual assets or asset classes might contribute to delivering on CPI+ objectives within diversified portfolios. Attributes that may be considered beneficial include:

1. **Real expected return exceeding the CPI+ target** – The importance of investing in assets that offer real expected returns in excess of the CPI+ target was discussed in Section 3.1 and Section 6.
2. **Protection against the possibility of sustained losses in other assets** – Investments that pay-off when higher returning assets such as equities are suffering from a tail event resulting in sustained loss could help restrict losses in the lower part of the wealth distribution.
3. **Inflation hedging characteristics** – Given that high inflation may impair returns across most asset classes while raising the hurdle rate of return to be achieved, investments that hedge inflation may be valuable for limiting potential shortfall under an inflation shock.

Investments that meet all the above criteria are rare, if not mythical, beasts. Assets that are negatively correlated with other assets that offer high expected returns or help protect against tail risks or inflation are often priced for lower expected returns than required to achieve the CPI+ return target. That is, portfolio protection typically comes at a cost to expected return. Below we focus on the potential nature and role for investments that might help limit shortfall versus CPI+ objectives through either protecting the portfolio against both the risk of sustained loss in assets with high expected returns (i.e. attribute 2) and high inflation (i.e. attributes 3). We implicitly assume that exposure to risk assets like equities will be used to access real expected returns in excess of a CPI+ target.

### 7.1 Protecting against sustained loss

Below we discuss three measures that might be taken to protect a portfolio against the risk of sustained losses for the long run which stem from assets held in pursuit of higher returns, in particular equities. Losses of the type envisaged below can tend to be associated with deflationary episodes, providing some distinction against the discussion around inflation protection appearing in Section 7.2.

- **Diversify to protect against equity risk** – As discussed in Section 6, equities tend to dominate the performance of multi-asset portfolios while accounting for the majority of risk. Thus any asset that provides ballast under conditions where equity markets suffer a sustained dislocation should help to protect the portfolio. This suggests a potential role for mid-risk assets such as property or infrastructure, or perhaps other alternatives such as hedge fund strategies which carry limited equity exposure ... to the extent that they offer this protection without sacrificing too much expected return. In this regard, focus might be placed on how these assets would fare under circumstances resulting in a major dislocation in equity markets<sup>40</sup>. Long duration fixed income may also help protect the portfolio under scenarios where equity declines are associated with significant reductions in long-term interest rates. However, avoiding too much reduction in portfolio expected return may present a higher hurdle in the case of fixed income<sup>41</sup> than mid-risk assets.
- **Investments that pay-off in disaster states** – Another approach might be to hold positions in options and similar protection strategies (e.g. go long in volatility derivatives) that pay-off when equities suffer large declines. The use of portfolio protection strategies in the context of a long-term CPI+ objective raises a number of issues. First, these strategies tend to be 'expensive' in the sense of incurring a significant cost to long-term expected returns if held on a sustained basis, which can then

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<sup>40</sup> Unlisted assets can exhibit lower volatility than equivalent listed assets for reasons such as valuation processes based on model-based or appraisal values, fewer transactions in difficult periods and potential for listed markets to overstate volatility due to 'last trade' marginal pricing. Nevertheless, this lower volatility is mainly relevant for the tenor of risk over shorter horizons than the risk of shortfall versus CPI+ objectives over the long run.

<sup>41</sup> Credit is more debatable. While it offers higher expected returns than government bonds, in part in compensation for illiquidity, credit is exposed to similar economic risks to equities.

exacerbate the probability of failing to achieve a CPI+ objective over the long run. Second, these strategies can be problematic in the presence of other objectives, for instance creating tracking error relative to the YFYS test and peers for super funds. Another approach could be to locate assets that deliver in states of the world where equities do particularly poorly. The issue is that such assets are either rare or scenario dependent (e.g. gold may hedge equity risk in some situations, but not others), and may offer low expected returns.

- **Engage significantly in dynamic asset allocation (DAA)** – Dynamic asset allocation was discussed in Section 6.4. Adjusting the asset mix could in theory be used in the situations when equity risk is particularly high relative to other assets, e.g. there is high confidence that equity markets are in a bubble. Hurdles include that DAA is a specialist activity that is difficult to implement effectively, and making significant changes to asset weights may be inhibited by other portfolio objectives and constraints (as per Section 3.1).

A key diversification activity undertaken by super funds is investing in alternative assets, including private markets, with exposures of 20%-30% being relatively common. Institutional settings limit most of the other measures that we outline above. The use of portfolio protection strategies is particularly difficult in the presence of the YFYS performance test. Under the YFYS performance test, super funds can vary their SAA across 18 distinct sectors without incurring any test 'tracking error', which accommodates diversification based on the asset class mix to a degree. Nevertheless, peer group effects, benchmark limitations (especially in alternatives) as well as fee and liquidity constraints could still restrict the size of positions in assets that may be attractive under a CPI+ objective.

By comparison, other investor types appear to engage more significantly in these activities. The return drivers used by the Future Fund appear more diversified including making greater use of unlisted opportunities (see Figure 3). Some of the alternative strategies utilised by the Future Fund also provide an element of downside risk protection. Real return funds offered by investment managers appear less peer constrained and vary significantly in their portfolio construction. While their portfolios are often highly diversified, it is difficult for such managers to include sizable allocations to unlisted assets. Some of these managers employ downside risk management strategies, typically implemented directly. Appendix 1 outlines portfolio weights for real return funds offered by Australian investment managers, which differ starkly both from each other and from the asset allocations held by super funds.

## 7.2 Protecting against high inflation

Inflation shocks may impact on the ability to achieve CPI+ objectives through their effects on the nominal return hurdle and potentially asset returns and effective tax burdens<sup>42</sup>. For instance, the post-COVID period and the 1970s were two periods during which most assets generated poor real returns due to failing to keep pace with inflation. Protecting a portfolio against high inflation is less straightforward than it may seem at first sight. Following Warren (2021), it is useful to think of how higher inflation may impact on assets through the channels of cash flows and discount rates. Other considerations include the degree to which expected inflation is built into asset expected returns, and whether assets with inflation hedging characteristics offer low expected returns and thus might exacerbate the probability of shortfall versus a CPI+ objective over the long run. We consider two case studies and then address the issue of horizon before summing up. Refer Appendix 3 for a brief discussion of whether equities might offer an inflation hedge over the long run.

### 7.2.1 Case study 1: Cash

While cash typically offers real returns below real return targets (and hence can increase the likelihood of shortfall versus a CPI+ objective over the long run), it might be considered for two reasons. The first is as a capital protection mechanism when markets are stretched, with the intent of deploying into the

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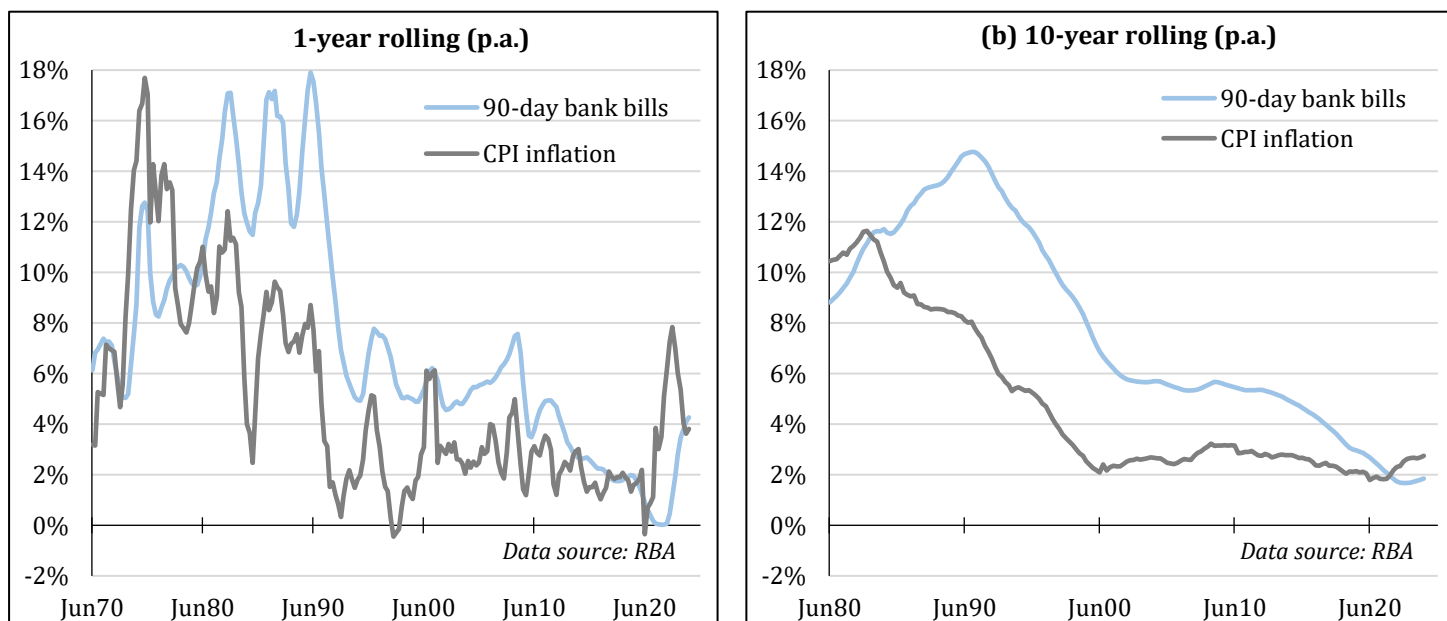
<sup>42</sup> Inflation can increase the effective burden on fixed income by taxing the inflation compensation embedded in nominal interest rates, other assets by taxing nominal capital gains, and on companies due to the gap between depreciation and cost of goods sold and replacement cost under historical cost accounting.

markets when (if) a correction occurs. Using cash in this way is essentially a subset of DAA. Second is using cash to help hedge against inflation on the basis that cash rates may adjust upwards in response, without any major risk of capital loss in response to discount rate adjustments (see Warren, 2021). Here we explore cash as an inflation hedge, while noting that our comments might also apply to other forms of floating rate debt, e.g. private credit.

The scope for cash to provide a hedge against inflation depends on how central banks conduct monetary policy. Cash may be expected to broadly track inflation movements in countries like Australia where central banks target inflation (often alongside other factors such as growth or employment). When monetary policy is operated in this way, the central bank is likely to hike rates in response to higher inflation<sup>43</sup>, potentially generating a period of high real rates when inflation picks up thus providing an inflation hedge. This was evident more recently following the post-COVID inflation surge, although the shift to positive real cash rates occurred at a lag in this instance leading to real losses in cash for a period of time. By contrast, long nominal bonds are highly exposed to unexpected inflation, and performed particularly poorly during the recent inflation episode. Other assets may also be prone to perform poorly under such situations as a consequence of price declines if their discount rates rise. In any event, the monetary regime and the conduct of monetary policy is foundational to cash providing an inflation hedge. Monetary regimes can change, and have done so historically.

Figure 12 illustrates some of these themes. Figure 12(a) reveals that the returns on a 90-day bank bills as proxy for Australian cash have sometimes tracked changes in inflation, but at other times have failed to do so or has done so at a lag, e.g. following the inflationary episode of the 1970s and more recently in the post-COVID period. This highlights the risk that central banks could be slow to react to increases in inflation. Figure 12(b) shows a long-term perspective by reporting cash returns and inflation over rolling 10-year periods. Over the very long run, cash returns have exceeded inflation. Since 1969, returns on 90-day banks bills exceeded CPI inflation by 2.2%.

**Figure 12: Australian 90-day bank bill returns and CPI inflation**



Cash might be expected to continue delivering real returns over the long run to the extent that the central bank targets positive real rates on average over the cycle. A real return of around 1% might be a reasonable expectation based on [reported RBA estimates](#) of the neutral rate of interest (i.e. r-star). However, this rate of return falls considerably short of the rate of return required to achieve the CPI+ objectives of most super funds. Figure 12 also reveals the impact of changing regimes in inflation,

<sup>43</sup> Central banks may set cash rates in response to inflation expectations, adding an additional complication.

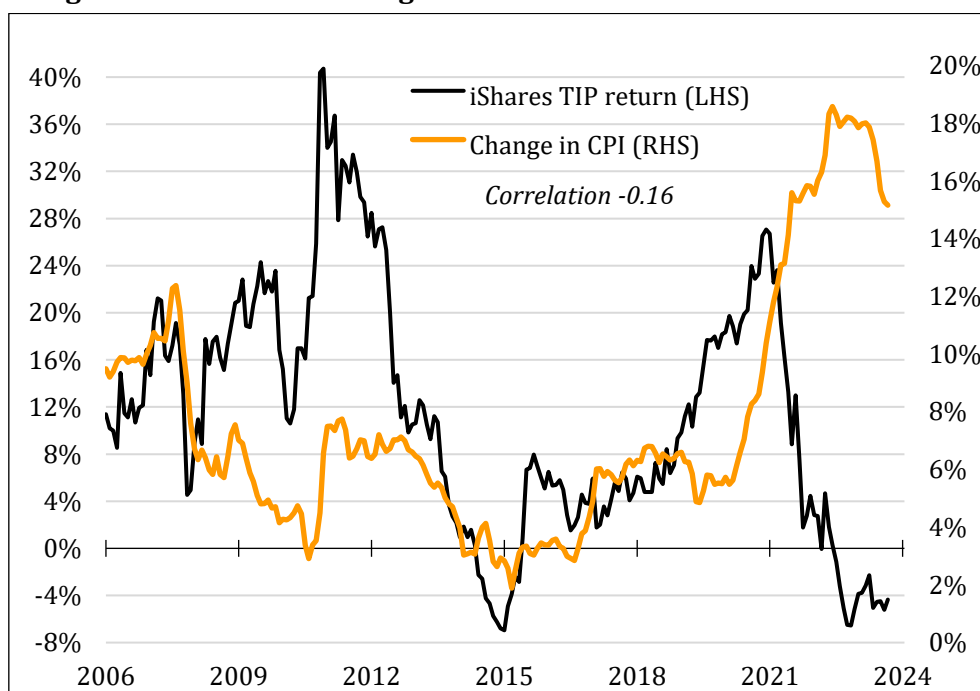
nominal rates and real rates over the years. It highlights the importance of considering the prevailing monetary regime before using cash as a potential inflation hedge.

## 7.2.2 Case study 2: Inflation-linked bonds

Assets are often identified as inflation hedges because they offer inflation-linked *cash flows*. This can include infrastructure, property and inflation-linked bonds. We use inflation-linked bonds as a case study to demonstrate that inflation-linked cash flows, while helpful, are insufficient for an asset to act as a reliable inflation hedge. Our framework is that the return on any asset can be expressed as a function of the initial expected return, changes in cash flows and changes in discount rates. (The latter may be viewed as synonymous with changes in expected returns.) From this perspective, how discount rates respond to changes in inflation can be important for whether an asset will protect the portfolio against an inflation shock. We illustrate this point by exploring US Treasury inflation-protected securities (TIPs) using return data on the iShares TIPS ETF. The full analysis of this case study is contained in Appendix 2, with the key findings summarised here.

Figure 13 compares 36-month rolling returns on the TIPS ETF against 36-month changes in the US CPI index. The correlation between the two series of -0.16 indicates that TIPs have tended to generate *lower* returns when inflation is higher. Closer examination reveals that this negative correlation is largely attributable to the post-COVID period when inflation and interest rates (i.e. the discount rate) both rose, leading to significant capital losses on TIPs. Appendix 2 shows that 95% of the variation in the 3-year returns on the TIPS ETF can be explained by starting real yield (a proxy for expected real returns), changes in inflation (a proxy for changes in cash flows) and the change in TIP yields (a proxy for changes in discount rates). While all three variables are significant, the inflation hedging component related to inflation-linked cash flows tends to be swamped by the two discount rate related variables. Indeed, the dominant variable appears to be changes in TIP yields, which have a correlation of +0.49 with inflation.

**Figure 13: 36-month rolling iShares TIPS ETF returns vs. US inflation**



This case study confirms that (long-dated) inflation-linked bonds provide quite unreliable inflation protection over short-to-medium timeframes. The primary reason is because exposure to inflation operates through changes in discount rates as well as cash flows. Where higher inflation is associated with a rise in real discount rates (as occurred in 2022 when central banks tightened), TIPs can perform poorly in response to an inflation shock. Again, the reaction function of central banks to inflation is relevant. Further, to the extent that inflation-linked bonds offer low real yields, they may also exacerbate the risk of shortfall versus a CPI+ objective over the long run. A further issue is that the inflation-linked

bond market does not offer the capacity to support large-scale allocations by the super funds. Inflation-linked bonds are no panacea for protecting a portfolio from inflation under CPI+ objectives.

The same issues arise for other assets that are generally considered inflation hedges such as infrastructure and property – especially property given the additional sensitivity of the property industry to interest rates. The ability of such assets to protect portfolios against inflation requires deeper consideration than assuming inflation-linked cash flows are sufficient in their own right.

### **7.2.3 Reflections on investment horizon**

Horizon is another consideration. Longer-dated assets with inflation-linked cash flows can protect against inflation if held to harvest those cash flows over the long run. For example, a long duration inflation-linked bond will generate the real returns expected upon purchase if held to maturity, regardless of what happens to the on-market yield in the interim<sup>44</sup>. Rises in discount rates act to shift the pattern by which expected returns accrue through time, leading to immediate capital losses but higher returns thereafter. A 30-year inflation-linked bond may deliver certain real returns over 30-years, but there will be a risk of incurring losses that are sustained over 10- or 20-years upon a significant rise in real yields. The implication is that asset duration relative to holding period is pertinent (Warren, 2021). We note that managing return outcomes and risk through duration matching is difficult in an institutional investment setting that emphasises benchmarking such as the super industry, noting that fixed income benchmarks regularly include newly-issued securities.

While there is evidence that equities have tended to perform poorly under higher inflation over the short-medium term, the extent to which they might hedge inflation over the long run is unclear. We offer brief comments on this issue in Appendix 3.

### **7.2.4 Summing up: protecting against inflation**

Identifying investments that might protect a portfolio against inflation shocks under a CPI+ objective requires taking a range of considerations into account. Relevant factors are the extent to which an asset provides inflation-hedged cash flows, the likely response of discount rates to an increase in inflation, sensitivity to discount rate changes in light of the horizon over which the CPI+ objective applies, and of course the expected return offered relative to that required to achieve the objective. The implications for other objectives might also come into play, e.g. how increasing exposure to assets that offer inflation protection might impact on relative return objectives. This wide range of considerations makes it quite difficult for inflation risk to be managed effectively under a CPI+ objective.

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<sup>44</sup> This a simplification where there are coupons to reinvest, which bring exposure to reinvestment rates.

## 8. Ideas for improving the framing of investment objectives

Our main contention is that CPI+ objectives are potentially useful for member communications (purpose 3 in Section 3), but in themselves are relatively ineffectual as objectives to manage towards and a benchmark for assessment (i.e. purposes 1 and 2). Also highly relevant is the fact that CPI+ objectives operate alongside other investment objectives. This situation opens up broader questions about how investment objectives for super funds are being framed and used. We raise four measures that could improve the effectiveness of how CPI+ objectives and investment objectives more broadly are framed.

### 8.1 Introduce SRPs

An SRP could act as a bridge between a CPI+ objective and both portfolio construction and performance assessment<sup>45</sup>. The SRP would reflect a basic portfolio that the member could access passively at a low cost<sup>46</sup>, and could be formulated towards a CPI+ objective and the level of risk that needs to be taken to achieve the objective<sup>47</sup>. The mandate of the investment team then becomes to outperform the SRP, which acts as a reference point against which portfolios are managed. Fund performance assessment would be based on realised return on the portfolio versus realised returns on the SRP, ideally with risk adjustments (as discussed in Bell and Warren, 2024). There are three levels at which SRPs could be deployed by super funds<sup>48</sup>:

- a) Internal benchmark for the investment team that is not made public;
- b) Presented to members as the basic low-cost portfolio that is consistent the CPI+ objective and a given level of risk, coupled with a statement that the fund is aiming to do better than the SRP and self-reporting of performance relative to the SRP;
- c) Formally incorporating an SRP into an expanded YFYS performance test as described in the Conexus Institute submission to the Treasury consultation on design options for the YFYS test (see Bell and Warren, 2024)<sup>49</sup>.

Any of the above options would serve to separate the formulation of CPI+ objectives for multi-asset portfolios from the management of those portfolios, and hence help dilute the two problems of the difficulty of managing towards CPI+ objectives and using CPI+ to assess performance. Publicly declaring CPI+ objectives (as per option b and c) could provide additional framing benefits for members, particularly around understanding the contribution of management to performance. In doing so, it might help deflect members from holding management to account for failing to deliver adequate returns which largely stem from broad-based weakness in markets. A counterargument is that many members may not understand the concept of an SRP, which might create confusion for some.

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<sup>45</sup> At first glance, the YFYS test may appear to adopt elements of an SRP. However, it ultimately amounts to a limited test of implementation of a fund's SAA without risk adjustment. The YFYS test also deviates from the concept of a basic portfolio that aligns with investor risk-return preferences and might be readily accessed at low cost. It specifies 26 benchmarks for asset classes, allowing super funds to choose their SAA across these asset classes for the purpose of assessment. By contrast, an SRP approach assesses the value-add that arises from determining SAA in addition to implementation of that SAA. An SRP is also investable, unlike some of the YFYS benchmarks.

<sup>46</sup> Some benefits of SRPs suggested by proponents include that they are: liquid and investible; incentivise competition for capital and more efficient use of active risk budget, rather than asset 'bucket-filling'; and can offer a simple and transparent proxy for stakeholder risk appetite.

<sup>47</sup> We previously mentioned NZ Super as a notable example. The Guardians are responsible for setting the SRP as an expression of risk/return preferences for the fund, and a benchmark for the investment management team.

<sup>48</sup> Assessment versus an SRP forms part of the APRA heatmaps, now referred to as the [Comprehensive Product Performance Package \(CPPP\)](#).

<sup>49</sup> Our recommendation is to introduce a three-metric test where the existing YFYS test is combined with two tests that assess total portfolio returns, described as 'peer comparison of risk-adjusted returns' and 'risk-adjusted returns relative to simple SRP frontier' in the Treasury consultation paper. These tests broadly align with the objectives being pursued by funds, while having three tests would limit the incentive to herd on any one test.

One concern expressed during feedback is that introducing an SRP might create an incentive for funds to hug any SRP benchmark and hence induce herding behaviour across the industry. We see this risk as limited provided that an SRP is one of various benchmarks being used for performance evaluation, e.g. if performance is being evaluated versus (say) an SRP, the existing YFYS test and a peer benchmark. (We recommended to Treasury that they shift to a three-metric YFYS test for this reason in part.) Another consideration is whether funds perceive attractive opportunities to outperform by deviating from the SRP. For instance, diversification may still be encouraged to the extent that it is quite likely to improve risk-adjusted performance relative to the SRP.

## 8.2 Add long-term risk measures to the mix

Section 3.3 raised the point that risk measures focusing on the likelihood and ideally potential magnitude of shortfall versus a CPI+ target return over an extended period such as 10- or 20-years are the preferred way to communicate the long-term trade-off between risk and return. Warren (2021) provides an in-depth discussion of long-term investment risk and its measurement. The Actuaries Institute also established a working group in 2020 that proposed a long-term risk measure based around the probability of not attaining a CPI+ objective over 20-years<sup>50</sup>. Another possibility could be to focus on either value-at-risk (VaR) or conditional value-at-risk (CVaR) based on simulation of real balances over (say) a 10-year horizon. These measures provide information on the magnitude and not just the probability of shortfall, with VaR reflecting the magnitude of loss at a specified probability threshold and CVaR reflecting the expected magnitude of loss below a probability threshold. However, most members would likely find these measures difficult to interpret. Another possibility might be to communicate an indication of short-term and long-term risk without providing an explicit measure. A few funds already adopt this approach, including [AustralianSuper](#) and [Aware Super](#). We envisage any long-term risk measure or indication being used alongside a shorter-term risk measure. In any event, we consider the SRM to be a poor measure and suggest that it should be reviewed.

Issues with implementing this idea include that long-term shortfall risk measures need to be based on modelling over long period (e.g. simulation analysis), and that reporting additional risk metrics would add complexity for members. In any event, consumer testing would be beneficial.

## 8.3 Disclose the presence of multiple investment objectives

We see a case for explicitly disclosing to members all the objectives that portfolios are being managed towards. This would convey to members that CPI+ is one of a range of investment objectives, thus avoid leaving a misleading impression that delivering a real return is all that their super fund is trying to achieve. For instance, members might be told if the fund is aiming to either pass the YFYS test and/or outperform a peer group in addition to delivering on the CPI+ objectives. For example, [AustralianSuper](#) declares the existence of both CPI and peer-relative objectives.

## 8.4 Improve consistency in objectives being disclosed to members

We find the lack of consistency across and within super funds in how CPI+ objectives are calculated and presented to members and their relationship with 'risk' proxies (see Section 5) as somewhat disturbing. We see a case for greater standardisation around CPI+ objectives and related measures such as any risk metrics and growth-defensive categorisations that are being *disclosed to members*. (The Conexus Institute has led an industry working group on growth-defensive categorisation<sup>51</sup>.) The aim might be to ensure a reasonable degree of consistency and comparability in terms of both what is presented to members regarding the real returns they might expect and related risk measures. The intent would be

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<sup>50</sup> For a summary of this initiative, see <https://www.actuaries.digital/2020/07/08/understanding-long-term-risk-for-superannuation-members/albeit-based-on-simulated-returns/>.

<sup>51</sup> See: <https://theconexusinstitute.org.au/resources/growth-defensive/>.

to limit potential to confuse or mislead members, and improve performance under our third purpose (as per Section 3) of communicating expectations and assisting investment choice.

However, the appropriate degree of standardisation is a vexed issue. We loosely base consideration of this matter around two broad issues:

- (a) **Disclosures by individual super funds** – Should funds be disclosing only one version of real return objectives with respect to any strategy to members? That is, should the dichotomy between real return targets on MySuper dashboards and other formulations of CPI+ objectives (i.e. those disclosed in PDSs or for choice options with the same underlying investment strategy) be ended?
- (b) **Formulation** – Should the basis of how CPI+ objectives and related risk measures are formulated should be standardised *across* super funds? Doing so would entail addressing which elements<sup>52</sup> of how objectives are formulated should be standardised and in what way.

We see no clear reason why consistent disclosures of indicated real return objectives by individual super funds should not be progressed, i.e. point (a). Standardising how objectives are formulated across super funds (i.e. point (b)) is more controversial, but nevertheless warrants consideration and further research by regulators and industry in light of the findings of Section 5.

In any event, standardising disclosures to members and how those disclosures are being formulated would still leave it open for super funds to set their own objectives and metrics for internal purposes such as portfolio construction, including scope to choose the capital market assumptions and modelling method. We acknowledge that having different modelling assumptions for member disclosures and portfolio management is less than perfect<sup>53</sup>. However, this reflects the current situation to a degree given the disparities between how CPI+ objectives may be set under SPG 530 and real return targets appearing on MySuper dashboards outlined in Section 5.

We acknowledge that the idea of standardisation appears to run contrary to current regulatory trends<sup>54</sup>. We also received some pushback against the idea as discussed in Appendix C.

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<sup>52</sup> Examples of elements that might be examined for potential standardisation might include the formulation of expected returns, how risk is being characterised and modelling method, e.g. conditional or long-term average returns (see Section 4.2).

<sup>53</sup> Creating a gap between the indicated real returns that are disclosed to members and a trustee's best estimates gives rise to various issues to be explored. Questions to address include which approach might best inform members when it comes to selecting an appropriate investment option and impacts on portfolio management practices.

<sup>54</sup> For instance, in the area of superannuation calculators and retirement estimates, [ASIC increased flexibility \(i.e. reduced standardisation\) of investment return assumptions](#).



## 9. In closing: Tread carefully with CPI+ investment objectives

While CPI+ objectives may seem logical at first sight, they give rise to a number of issues especially for super funds. In particular, super funds are highly constrained in effectively managing their portfolios towards a CPI+ objective, which are also of limited use as a benchmark for performance assessment as real return outcomes largely depend on what the markets (especially equities) happen to deliver. These aspects cause us to question the effectiveness of CPI+ objectives in an investment management context. Super funds can at best consider the likelihood of achieving a CPI+ objective in constructing portfolios while balancing other relative-return objectives and portfolio constraints, which may result in tinkering around the margins.

We see potential merit in CPI+ objectives for the purpose of member communications and assisting investment choice. Confronting members with the balance between long-term expected real returns and risk can help members to understand the trade-off between risk and return across investment options. Unfortunately, currently the super industry does not seem to be doing this effectively. There are inconsistencies within super funds as well as large variations across super funds in the way that real return objectives are being presented. There is limited consistency between stated real return targets and related 'risk' proxies, while the measure of risk presented to members – the SRM – is poorly paired with a long-term investment objective such as CPI+. Industry practice needs to shift to maximise the potential benefit.

We have posed the question: “*what is the role of CPI+ objectives?*”. Our answer is: “*they do have a role to play, but it is constrained and there is much room for improvement*”. We offer four ideas that might improve the situation. The first would be introducing SRPs as a bridge between the CPI+ objectives and the management and assessment of portfolios. Second would be to present members with a measure of long-term risk to better inform the trade-off between expected real return and risk. The third would be to disclose the presence of other investment objectives so that members are made aware their super fund is trying to achieve more than just delivering on a real return objective. Finally, the greater consistency in how CPI+ objectives and other metrics are formulated and presented to members might be helpful and should be explored.

## References

- Actuaries Institute. 2014. Submission to ASIC on Reporting Standards (14 August). Available at: <https://www.actuaries.asn.au/Library/Submissions/Superannuation/2014/140814APRATargetReturns.pdf>.
- Bai-Marrow, A. and Radia, S. 2017. “Benchmarks and Indices”, *CFA Society United Kingdom*, Position Paper (July). Available at: <https://www.cfauk.org/-/media/pdf-main/professionalism/reports-and-whitepapers/position-paper---benchmarks-and-indices.pdf>.
- Bell, D. and Warren, G. 2024. “Submission to Treasury on design options for the annual superannuation performance test. *The Conexus Institute*. Available at: <https://theconexusinstitute.org.au/wp-content/uploads/2024/05/Submission-Annual-superannuation-performance-test-design-options-The-Conexus-Institute-20240419-final.pdf/>.
- Leibowitz, M.L. and Bova, A., 2005. “Allocation betas.” *Financial Analysts Journal*, 61(4), pp.70-82.
- McQuarrie, E.F., 2024. “Stocks for the Long Run? Sometimes Yes, Sometimes No.” *Financial Analysts Journal*, 80(1), pp.12-28.
- Cooper (2010). “Super System Review: Final Report.” *Commonwealth of Australia*. Available at: [Super System Review Final Report - Part 1: Overview and Recommendations \(treasury.gov.au\)](https://www.treasury.gov.au/~/media/2/6/2/6/20100624_Super_System_Review_Final_Report_-_Part_1_-_Overview_and_Recommendations.pdf).
- Warren, G.J. 2021. “Investment risk for long-term investors.” *Working paper*. Available at: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3820435](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3820435).

## APPENDIX A

### Portfolios of real return funds offered by Australian managers

Below are the reported asset weights for two real return funds, with a viewing to demonstrating that the investment portfolios of funds that are designed to pursue a CPI+ return target may differ significantly from those of super funds. Meanwhile, other real return funds have portfolios that are not dissimilar to those of super funds. Examples include the [Morningstar Growth Real Return Fund](#) and the [Russell Investments Multi-Asset Growth Strategy Fund](#). These examples help illustrate the potential for real return funds to differ considerably in how they implement their strategy.

<b>Schroders Real Return Fund</b>		<b>Perpetual Diversified Real Return Fund</b>	
<i>Return of CPI (trimmed mean) plus 4% to 5% p.a. before fees over rolling 3-year periods while minimising the incidence and size of negative returns</i>		<i>Objective: Pre-tax return of 5% p.a. above inflation (before fees and taxes) over rolling 5-year periods, while minimising downside risk over rolling 2-year periods.</i>	
<b>Sector</b>	<b>Weight at December 2024</b>	<b>Sector</b>	<b>Weight at December 2024</b>
Global equity	31.2	Cash and enhanced cash	43.9%
Australian fixed income	15.0	Duration hedges	23.9%
Australian higher yield	13.3	Emerging market debt	4.7%
Cash and cash equivalents	10.2	Australian bonds	4.1%
Global fixed income	6.3	Credit	4.1%
Insurance linked securities	5.8	Infrastructure	3.3%
Emerging market bonds	5.0	Emerging market equities	3.1%
Australian equity	4.0	Commodities	2.8%
Commodities	3.0	Specialist credit	2.7%
Private equity	2.2	Listed property	2.5%
Australian inflation Linked	2.0	Market neutral equities	2.5%
Asian credit	2.0	Australian shares	1.6%
Other	0.0	Global equities (developed)	0.8%
<b>Total</b>	<b>100%</b>	<b>Total</b>	<b>100%</b>

Source: <https://api.schroders.com/document-store/AUF-Real-Return-Fund-Wholesale-Class-Dis-FMR-AUEN.pdf>

Source: [https://www.perpetual.com.au/4a75b1/globalassets/au-site-media/01-documents/01-asset-management/01-fund-resources/fund-profiles/739\\_pfp.pdf](https://www.perpetual.com.au/4a75b1/globalassets/au-site-media/01-documents/01-asset-management/01-fund-resources/fund-profiles/739_pfp.pdf)

## APPENDIX B

### Inflation-protected bond returns under CPI+ objectives

We examine returns on an ETF that invests in US Treasury inflation-protected securities (TIPs) to demonstrate that inflation-protected bonds do not deliver real returns in a way that reliably helps to achieve CPI+ objectives. We show that TIPs provide an unreliable inflation hedge over the short-medium term. Further, they can tend to offer low real returns (albeit depending on the starting yield), and hence may contribute to shortfall versus a real return target over the long run. Our analysis is based on 36-month<sup>55</sup> rolling returns on the iShares TIPS Bond ETF<sup>56</sup>, which has been US-listed since December 2003 providing over 20 years of return data. We relate returns on the iShares TIPS ETF to three components:

- *Starting real yield* – This is the real expected return on offer at the beginning of each 36-month period, which we proxy with the TIPs yield at 10-year constant maturity as calculated by the St Louis Fed.
- *Change in CPI* – The change in inflation determines the uplift in income paid by TIPs and may be viewed as a change in cash flows. Linking the cash flows to inflation represents the key source of inflation protection.
- *Change in TIP yields* – This is a proxy for change in discount rate and will result in capital gains or losses. We use the change in the TIPs yield at 10-year constant maturity over the 36-months<sup>57</sup>.

The chart set over plots the 36-month return on the iShares TIPS ETF versus the above three variables individually plus a fitted regression model (as reported below the charts) that combines all three variables. Of immediate interest is that returns have a *negative* relation with the CPI change when considered in isolation, with a correlation of -0.16. This is the opposite of what would be expected if TIPs provided reliable inflation protection over 3-year time frames, which may be considered a meaningful period in an investment context<sup>58</sup>. Meanwhile, a high positive correlation of 0.78 emerges between the TIPS ETF return and the starting TIP yield and a strong negative correlation of -0.90 between the TIPS ETF return with the change in TIP yields. The direction of these two relationships is as expected, i.e. higher starting yields result in higher returns, while rising TIPs yields cause lower returns through capital losses. When all three series are included together as explanatory variables in a regression, each emerges as significant with the expected sign. This includes the CPI change, which now carries a positive coefficient of 0.82 suggesting that a 1% rise in inflation boosts 3-year returns by 0.82%.

Closer examination reveals that the different relation between TIPS ETF returns and inflation that emerges when the CPI change is considered in isolation versus in conjunction with the other variables stems from the change in the CPI having a positive correlation of 0.49 with the change in the 10-year TIPs yield. This indicates that when inflation was higher that TIPS yields were often also rising. Indeed, it appears that the inflation protection benefit from inflation-linked cash flows was swamped by the increase in TIPs yields that occurred along with higher inflation during the analysis period. The message is that TIPs may not provide inflation protection if real interest rates are rising in conjunction with inflation, say perhaps because the central bank is tightening policy to rein in inflation. This is exactly what happened during the post-COVID years, as clearly evident in the above charts.

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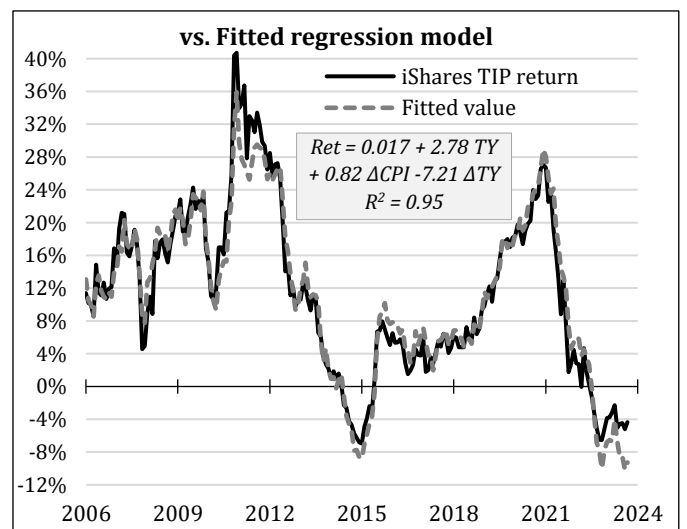
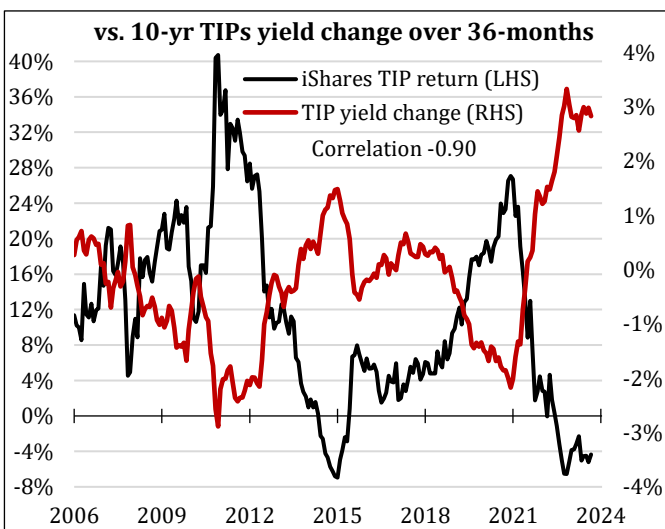
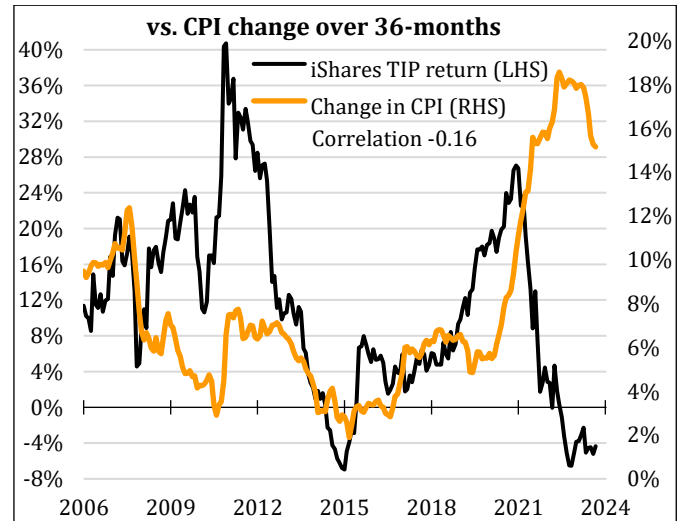
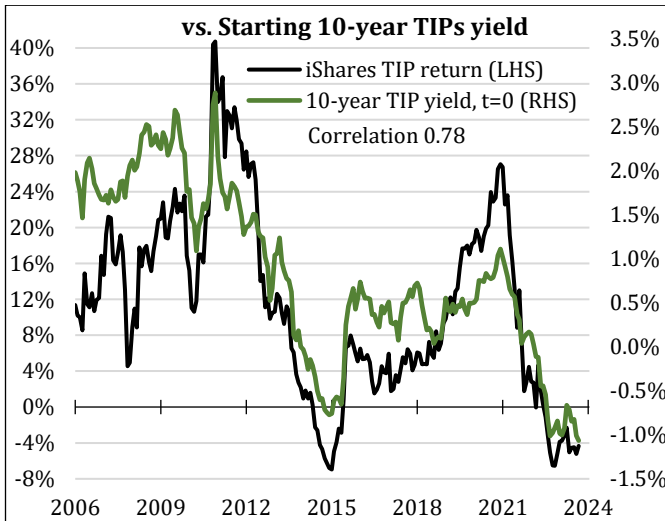
<sup>55</sup> We also examine 12-month rolling returns, and the findings are similar.

<sup>56</sup> See <https://www.ishares.com/us/products/239467/ishares-tips-bond-etf>.

<sup>57</sup> This is a noisy proxy for various reasons, including that a security of 10-years maturity becomes a security of 7-years maturity over 36-months, and the iShares TIPS ETF will comprise a changing portfolio of securities with differing duration that may not match a 10-year TIP. The TIPS ETF factsheet reports a weighted average maturity of 7.1 years and duration of 6.5 years as of June 2024.

<sup>58</sup> We do not test longer periods, where the relation between the TIPS ETF returns and TIPS yields would become harder to identify noting that the ETF will contain an evolving portfolio of securities where maturity decreases on existing securities and new securities are added at prevailing yields over the course of time. Our prior is that the starting TIPs yield and CPI change will become more important in explaining returns than the change in TIPs yield as the measurement period for returns is increased.

## Explaining 36-month rolling returns on the iShares TIPS ETF



Source: Blackrock, St Louis Fed

### Regression model:

$$Ret_{t-36 \text{ to } t} = 0.017 + 2.78 TY_{t-36} + 0.82 \Delta CPI - 7.21 \Delta TY$$

(2.8) (8.4) (13.4) (-44.5)

$R^2 = 0.95$ , t-statistics in brackets

t-statistics in brackets (albeit overstated under rolling returns<sup>59</sup>)

### Where:

$Ret_{t-36 \text{ to } t}$  = Return on iShares TIP ETF over 36-months

$\Delta CPI$  = 36-month change in  $CPI = CPI_t / CPI_{t-36} - 1$

$TY_{t-36}$  = Starting 10-year TIP yield 36-months prior

$\Delta TY$  = 36-month change in  $TY = TY_t - TY_{t-36}$

The importance of the starting TIPS yield for the return subsequently generated is particularly relevant under CPI+ objectives. Low real returns should be expected when TIPS offer very low real yields. In such circumstances, TIPS may be particularly unattractive for two reasons. First, they may be offering expected real returns that fall short of the real return target, at least if held through to maturity. Second, there is the additional possibility that, if inflation does pick up, any inflation protection might be overcome by an upward adjustment in real yields thus taking the investor even further away from the CPI+ return target.

The bottom line is that inflation-protected bonds are no panacea for attaining a CPI+ objective, despite offering what appears to be guaranteed real returns. Not only can the real return often be inadequate to achieve the targeted real return; but their ability to provide inflation protection depends not only on the presence of inflation-linked cash flows but also how real yields (i.e. discount rates) respond in the face of rising inflation. It seems hard to avoid the conclusion that inflation-protected bonds are only attractive under CPI+ objectives where the real yields on offer are sufficient near, or ideally exceed, the targeted real return.

<sup>59</sup> When non-overlapping periods are used, t-statistics reduce but remain statistically significant except for the intercept. A similar R-squared is generated.

# APPENDIX C

## Selected feedback and responses

### What about liability-driven investing (LDI)?

A number of people (mainly actuaries) suggested the objective that super funds are working towards could be framed around LDI on the basis that retirement income amounts to a type of liability – even in a DC setting. This framing suggests focusing on wages as a baseline, to the extent that wages are most closely linked to the liability at the point of retirement (e.g. as a replacement rate of income nearing retirement). We also received a couple of comments that DC and DB were ‘solving for the same problem’.

**Response:** We disagree with applying LDI framing in a DC super context, or at least view it as having shortcomings relative the lifecycle framing presented in Section 2.1. We also disagree that DC and DB funds are solving for the same problem.

In a DB setting, the aim is to satisfy a defined liability that is typically linked to wages. Further, DB fund sponsors are funding an explicit obligation. In a DC setting, the aim is to invest to maintain and ideally enhance the real purchasing power of accumulated assets. Individual members are saving, investing and drawing down on their own assets under discretion, and bearing the consequences. We are reluctant to embrace the view that retirement income is a liability in a DC setting as it is constrained by the assets that are accumulated, and the income drawn from those assets arise out of choice rather than obligation. Specifically, members have the flexibility to choose how much retirement income to draw or whether to take a lump sum, or perhaps even withhold from drawing income and use their assets as a precautionary saving pot or possibly support a bequest. The consequence is that the ‘promise’ is not defined and accordingly not well described as a ‘liability’.

One gets closer to the concept of a liability if an income target is applied (e.g. ASFA comfortable, replacement rate), in which case there is an explicit amount of income that the member is targeting. Even then, the value of the liability is stochastic due to uncertainty over a member’s own life expectancy (which is much less of an issue in DB funds due to pooling). In addition, members may fund any target income out of other assets and Age Pension access, making it even harder to define assets within super as *the* funding source for the liability. Super is at best a contributor to funding income in a DC setting.

### Why not use a baseline other than CPI in formulating return objectives?

We heard suggestions that wage+ or bond+ may be more appropriate than CPI+, on the basis that wages are linked to the retirement ‘liability’ (see above) and long bonds are the closest available to a risk-free asset over long horizons.

**Response:** We discuss alternative baselines as an appendix appearing at the end of this Appendix, including wage+, cash+ and bond+. To summarise, we are not fans of a wage+ benchmarks for the reasons outlined above with respect to LDI. Using an interest rate baseline would partially solve the issues with CPI+ through adjusting the objective for baseline expected returns available in the market at any time. However, many of the issues we raise with CPI+ objectives would remain intact. In any event, there seems insufficient benefit in switching from CPI to another baseline, especially given that CPI+ objectives are familiar and accord with the aim of accumulating real wealth.

### Aren’t equities an inflation hedge over the long run?

A few people suggested that equities were an effective inflation hedge over longer periods.

**Response:** We intentionally do not take a stand on this issue. Whether equities hedge against inflation was discussed in Warren (2021): we reproduce the key passage over. Suffice to say that the issue is complex. We also note that any asset priced for positive real returns may mechanically appear to offer an inflation hedge after a long enough time period simply by the fact the wealth index arising from investing in that asset should exceed inflation as real returns accrue over time. Of more relevance is how

equities respond to an unexpected rise in inflation over periods such as 10-20 years. What happens to real equity returns over such time frames is debatable.

*“The impact of inflation on equities is a deep and unresolved issue, so only general comments are offered here. A key consideration is how equity cash flows respond to changes in inflation. It may be tempting to conclude that equity cash flows are inflation-hedged given that overall revenues may rise with inflation. However, casual analysis reveals that return on capital measures such as return on equity (ROE) only partially adjust with inflation<sup>60</sup>, implying that real reinvestment rates may decline when inflation increases. It is also not clear that growth rates on baseline earnings from existing operations will adjust one-for-one with inflation: the response may depend on business conditions or market structure (e.g. pricing power, existing contracts, etc). Higher inflation can also have adverse tax effects, e.g. see Feldstein (1980). Hence equity cash flows may not be completely inflation hedged, possibly helping to explain why equities have suffered under higher inflation.”*

## Introducing an SRP could create many problems – is it worth it?

We encountered push-back on introducing an SRP from some quarters. Concerns included:

- Potential for hugging SRP benchmarks and herding by super funds
- Distortions from the understatement of risk for private assets, if a risk-adjustment is applied
- SRPs would be poorly understood by members

**Response:** We view all these concerns as having merit and have responded to some extent within Section 8.1. The main question is whether the benefits of introducing SRPs exceeds the costs, bearing in mind that *ALL* approaches for framing objectives have their problems. We view SRPs as worth the effort.

Central to our stance on SRPs is that they should only be introduced into external performance assessment of super funds as part of a multi-metric test. We recommended in our submission on the YFYS test (Bell and Warren, 2024) that Treasury moves to a 3-metric test comprising an SRP alongside the existing YFYS test and peer-relative returns adjusted for risk exposure. A large part of our reasoning in suggesting this multi-metric test is because it is hard to herd around three quite different benchmarks. This should address the first concern with SRPs as listed above. In the absence of establishing a multi-metric test, SRPs should remain a tool that may be used by super funds for their own purposes.

Regarding the risk distortions arising from private assets, this issue might be partly addressed by ensuring that risk metrics are estimated using yearly data that span a full revaluation cycle. A further consideration is whether it would be detrimental for members to establish an SRP with risk adjustment that might encourage investment in private markets with a view to reducing measured portfolio risk. There is an argument that encouraging diversification in this way may be beneficial for members, and would further help to counter any tendency to herd around the SRP benchmarks.

We fully agree that member understanding of an SRP might be problematic.

## Do we really need to standardise?

We received some push-back on the idea of standardising how CPI+ objectives are set. In addition to an element of philosophical aversion to policy makers dictating practice to industry, we also sense that super funds are resistant to standardising when they apply different modelling approaches.

**Response:** These are fair points, and we agree that standardisation should only be pursued where necessary. We see a good case for some standardisation to ensure at least reasonable levels of consistency around what is disclosed to members. Nevertheless, we responded to the resistance to standardisation by adjusting how our call was pitched. Specifically, we emphasised ensuring consistent disclosures by individual super funds, while we toned down our initial recommendation for greater standardisation of the formulation of objectives across funds to call for the issue to be examined.

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<sup>60</sup> A regression of the ROE on the Datastream World Equity Index on the G7 Consumer Price Index over the period January 1980 to December 2020 reveals a slope co-efficient of +0.20 (t-statistic 8.85, R-squared 11.4%).

## What do you mean by “long-term”? What horizon are you talking about?

Some commentators raised the issue of what ‘long-term’ meant in the context. Is the long term over 10 years, 20-years, or something else? This query also relates to the horizon over which CPI+ objectives should apply. A related suggestion was that performance assessment relative to CPI+ objectives may be valid if conducted over long enough time horizons.

**Response:** There is a sense in which being precise on horizon is unnecessary, hence we have left the ‘long-term’ undefined. Long-term investing may be viewed as more of a mindset than related to a specific investment horizon, and largely requires looking beyond market cycles to focus on long-term expected returns. Another issue is that time horizons vary across members depending on when they intend to use the assets. For instance, a 25-year old member should be concerned with outcomes over 40-years or more, while a member approaching retirement may face a ladder of horizons depending on when they intend to draw on their super. Being too precise on horizon may be unhelpful. From a practical perspective, a 10-year horizon (or at most 20-years) should suffice for setting a real return objective, as it would allow most of the cyclical influences to wash out and is relevant for most members.

We are more sceptical over whether assessing performance against a CPI+ objective provides useful insights, even if done over very long periods such as a few decades. The primary reason is that real returns over long horizons are largely a function of initial conditions, i.e. the real returns available in the market at the start. Performance should be better if markets are priced for high real returns (e.g. coming out of the GFC) than when markets are priced for low real returns (e.g. prior the 2000 tech wreck). One would thus be assessing the consequences of available market opportunities rather than value added by super funds to a substantial degree. Another important issue is that assessment becomes less relevant at longer horizons as the organisation and people that produced the performance are likely to have changed significantly. It is better to assess the effectiveness of investment decisions against the opportunities available in the market over a meaningful time frame, which is what an SRP facilitates.

## Comments on relative importance of the three main investment objectives

We heard a very wide range of perspectives on the relative importance of CPI+ objectives, peer comparisons and the YFYS performance test. For example, some saw CPI+ as central and the other objectives as constraints to be managed on the way to maximising real returns. Others placed highest priority on either peer comparisons or the YFYS test and treated CPI+ as more of an outcome after addressing other priorities. Another view was that managing towards stated objectives was secondary to forming the ‘best portfolio possible’, and that doing so would only maximise the chances of delivering on any and all objectives. One interesting perspective was that CPI+ objectives might be considered a ‘north star’ for portfolios.

**Response:** We have no major comments to add, except that our conclusion that the presence of other objectives acts to constrain managing towards CPI+ objectives remains valid.

## Taking a CPI+ objective as a literal target can be dysfunctional

One thought-provoking comment was that applying CPI+ objectives as a strict return target could lead to pro-cyclical investing. For instance, a situation where assets are inexpensive and expected real returns are high may encourage reducing weights to higher returning, riskier assets as less exposure to such assets is required to achieve the CPI+ target. Conversely, when assets are expensive and expected real returns are low, there arises an incentive to take more risk to ‘reach for return’. To the extent that expected returns are highest when markets are near a low and lowest when markets are near highs, the result could be pro-cyclical, momentum investing. A related and somewhat trite comment we received was: “*if you exceed your CPI+ target, do you give the money back?*”

**Response:** Both comments are interesting as they show what might happen if CPI+ objectives are taken as a literal target. They remind that return versus risk should be optimised regardless in all situations. Our take is that the way through this issue is to *maximise expected returns relative to risk defined as shortfall versus the real return target*, rather than aiming to hit the target precisely.

## Bonds may be more suitable as a portfolio stabiliser

We received a comment that long duration sovereign bonds might do a better job at protecting portfolios against weakness in equity markets than short duration fixed income, especially as the latter forego long-term return and do little to mitigate short-term volatility. The underlying notion is that bonds tend to rally when equities decline.

**Response:** We have two issues with this stance. One is that the ability of long bonds to dampen equity risk relative to cash depends on the equity-bond correlation, which is regime-specific. Second, as argued in Section 7.2.1, (nominal) long bonds are much more exposed to inflation risk than cash. We are willing to accept that inflation protected bonds may provide more effective long-term portfolio protection. However, as argued in Section 7.2.2 and Appendix B, this depends on horizon and behaviour of discount rates. Inflation protected bonds may also forego long-term real returns, although this will depend on pricing at the time.

## Appendum: Baselines other than CPI

- **Wage+ objectives** – Our broad stance is that establishing a link to wages is tenuous in a DC setting where the goal is to smooth consumption, as outlined above in our response to comments around LDI. Nevertheless, we add the caveat that a wage+ objective may be suitable under a replacement rate income objective, e.g. targeting post-retirement income equal to 70% of pre-retirement income. In this case, a wage+ objective during accumulation may link to the ultimate income target. However, two practical issues arise. First, income replacement rates are not universally deployed as an objective<sup>61</sup>. Second, income replacement rates are individual in nature as people experience a diversity of income trajectories during employment. As a consequence, the replacement income that will need to be delivered is not well captured by a general wage inflation index. One advantage of an inflation index such as CPI is that it is more universally applicable across individual members.
- **Cash+ objectives** – Using a cash rate as a baseline could help overcome the blindness of CPI+ objectives to the return opportunity set by anchoring both portfolio construction and performance assessment to a baseline low-risk return that is available in the market. It is also an ‘investable’ baseline, unlike CPI. The ‘+’ component would reflect a margin over cash arising from pursuing a return premium for taking risk. Managing towards a cash+ objective is more feasible than a CPI+ objective as it implicitly readjusts for the *general* level of expected returns. Nevertheless, it still leaves some of the problems with CPI+ objectives unresolved while introducing other issues. Expected returns and realised performance would remain largely a function of available return premiums over cash on riskier assets (in particular equity markets), over which funds have no direct control. Other issues include that: long-term CPI expectations would need to be developed to facilitate retirement projections; it may lead to reduced focus on CPI-related risk; and there could be scope for confusion to the extent that CPI+ is easier for members to grasp. Overall we conclude that the net benefit from making a substitution of cash+ for CPI+ objectives seem insufficient to make the shift.
- **Bond+ objectives** – A bond+ objective would also adjust for a reference low-risk rate of return that is available in the market, but also suffers from similar problems to those described above for cash+ objectives. However, long bonds are arguably even further from a risk-free asset than cash. Nominal long bonds are quite exposed to inflation risk, which makes them an unsuitable baseline in the context of objectives aimed at accumulating real wealth over the long run. Inflation-linked long bonds may be a better candidate but carry considerable capital risk and are only risk-free if matched with horizon and held to maturity (see Section 7.2.2 and Appendix 2). On balance we consider cash as a lower risk asset even over long horizons as it offers some degree of capital protection coupled with an ability to reprice in response to inflation shocks (see Section 7.2.1).

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<sup>61</sup> Other income objectives include budget-based income targets such as the ASFA standards and optimisation of expected income during retirement. Both are better aligned with a CPI baseline.