

## 2. A framework for assessing the adequacy of retirement income

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This chapter introduces a framework for assessing the adequacy of retirement income. That framework involves having clear adequacy objectives, calculating adequacy indicators, comparing those indicators to clear targets, and assessing overall adequacy with reference to policy goals. The chapter proposes tangible actions for policy makers to apply this framework.

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Adequacy is a core objective of many retirement income systems, and policy makers are in a position to assess whether people's retirement incomes will be adequate. However, this is no simple task. From the outset, there is no universal understanding about what is meant by adequacy, how to measure it, and how to assess retirement incomes with respect to this objective. Policy makers face challenges when it comes to setting pension policies and creating an environment that fosters adequacy in retirement: What do they mean by adequacy? What is an appropriate adequacy standard? How can they best account for and respond to the risks that affect retirement income adequacy when projecting future incomes? How can policy makers assess a system or a scheme with reference to adequacy objectives? What is the best way to balance adequacy objectives against competing objectives?

This chapter introduces a framework for assessing the adequacy of retirement income. It complements Chapter 1 of the *OECD Pensions Outlook 2018* (OECD, 2018<sup>[1]</sup>). That chapter discusses how to design funded retirement savings arrangements to complement pay-as-you-go (PAYG) public provision, with a view to meeting different objectives and sharing risks. This document builds on that work by discussing how to analyse adequacy bearing in mind those objectives, risk tolerances, and policy makers' appetite for trade-offs. Whether pension systems are voluntary or mandatory, public or private, PAYG or funded, policy makers can take steps to assess adequacy and respond in ways that help ensure pensions meet adequacy standards.

The chapter brings together into a coherent framework the different approaches to assessing the adequacy of retirement income. The framework calls for having clear objectives for retirement income, calculating indicators based on retirement income projections, and comparing these indicators to adequacy targets. Based on these objectives, indicators, and targets, this chapter suggests that policy makers should regularly assess the adequacy of individuals' future retirement income. They should consider the outcomes of these assessments with reference to their own policy goals for achieving those objectives. The chapter explains how these policy goals should be a function of policy makers' tolerances for risks and potential shortfalls, as well as the role governments see for themselves in achieving retirement income adequacy. This chapter also argues that assessing retirement income adequacy should account for risks to achieving it, such as financial, demographic, labour and behavioural risks. Policy makers can never completely eliminate these risks, but they can track and manage them using the information they have.

The policy guidelines in this chapter provide tangible actions for policy makers to take to implement the adequacy assessment framework. Before assessing adequacy, they should be clear about what their objectives are, or what they mean by adequacy. Given these objectives, policy makers should project future retirement incomes while accounting for risks and uncertainties. Based on these projections, policy makers can calculate indicators that provide information about adequacy. However, those indicators should be compared to targets for them to be meaningful in measuring adequacy with reference to an objective. Finally, policy makers can use this information to conduct an adequacy assessment with reference to policy goals, which define the extent to which policy should support an adequacy objective. Policy makers can then use the outcome of this assessment to take steps to improve adequacy where necessary.

## 2.1. A retirement income adequacy framework

This chapter focusses on how policy makers can assess the adequacy of a retirement income system or scheme in an aggregate sense with a view to understanding and potentially reforming existing policy. Its main focus is on assessing future retirement income outcomes, because those incomes are the result of today's policies.<sup>1</sup> It outlines a framework for policy makers to assess whether current policies are likely to yield incomes in retirement that are broadly in line with overall adequacy objectives. Policy makers look at adequacy from an overall public policy standpoint. This is a different perspective to what individuals would take to assess the adequacy of their own potential retirement income. Adequacy, as judged by individuals

or households, would reflect their own objectives for retirement and their personal circumstances. Government policy can certainly have a role in supporting individuals in making this assessment for themselves, but that is outside the scope of this chapter.

Having a framework for assessing the adequacy of retirement income is a useful way to structure the discussion. It is important because narratives on adequacy often mix questions of what adequacy means, what the standard for adequacy should be, and to whom those standards apply. The framework in Figure 2.1 differentiates between the different components of assessing retirement income adequacy.

**Figure 2.1. Framework for assessing retirement income adequacy**



A retirement income adequacy **objective** or set of objectives is about context. It refers to what a retirement income system intends to achieve as an ‘adequate’ retirement income. In other words, it answers the question, ‘*adequacy with respect to what?*’. Different objectives offer different perspectives for what an adequate income might entail. Common objectives, or answers to this question, are alleviating poverty or maintaining a standard of living in retirement, although these are not the only objectives.<sup>2</sup>

An **indicator** is a measure of retirement income. An indicator should be an appropriate proxy for a particular objective. There are many possible indicators, but some approaches are more prevalent than others. An example of a commonly used indicator is the retirement income replacement rate.

With a particular objective in mind, and an indicator to measure that objective, **targets** are reference points for determining if retirement incomes are adequate. Setting a target involves establishing an adequacy standard. That is, forming a view on issues like an appropriate replacement rate, a minimum subsistence standard, or the standard of living that allows people to live comfortably.

By considering the outcomes of adequacy indicators compared to targets across a population, policy makers should **make an assessment** of whether the system provides broadly adequate retirement incomes. This assessment should refer to policy makers’ goals, which in turn are a function of the extent to which they are willing to use policy to support a particular retirement income adequacy objective.

### **Objectives**

Retirement income adequacy objectives should reflect what policy makers and governments intend for retirement income systems or schemes to achieve. These policy priorities may reflect retirement income arrangements’ current or historical role and what policy makers want their future role to be. The objective could also be a function of what the public expects governments to deliver when it comes to retirement income. For example, populations in countries with a consistent history of mandated retirement income provision may expect a different objective than populations in jurisdictions where planning for retirement has historically been about free choice. In turn, policy makers and governments may account for those expectations in their own objectives.

A policy objective can be maintaining a pre-retirement standard of living. This implies that individuals should not experience a decline in utility when they transition from working to retirement. Utility is a difficult concept to quantify, which is why analysts refer to consumption as a proxy for utility. Accordingly, maintaining a standard of living is associated with a smooth consumption profile, and this objective is often referred to as a ‘consumption smoothing’ objective.

Another common objective of retirement income systems is poverty relief or allowing for basic subsistence. It denotes a minimum standard for retirement income systems, reflecting a social welfare function. Alleviating poverty and achieving a basic level of subsistence in retirement are technically different objectives. The first makes income the subject of the objective, while the second is focussed on consumption. However, they can be considered together for the purposes of discussing an adequacy framework. In most OECD countries, the objective of alleviating poverty is linked to public pensions or the public welfare safety net, limiting the role of funded pensions.

A retirement income system might have an objective of helping people achieve a good, or a desirable, standard of living in retirement. This objective assumes that retirement income policy should aim to achieve a standard of living that exceeds a minimum standard (and is closer to what individuals would require to live comfortably). This objective is particularly relevant to funded pension schemes, especially in countries where the purpose of funded pensions is to provide additional or complementary retirement income.

While equity is often a standalone objective for retirement incomes, it can also be part of the adequacy objective insofar as individuals gauge the adequacy of their own retirement income by looking at how they compare with other retirees, to previous retirees, or to a particular equitable standard. In other words, to some people, retirement income that does not deliver equity may not be adequate. But equity is subjective, and can have different meanings in different contexts and among different people. To some, retirement income equity implies redistribution to reduce inequality. To others, equity could involve people receiving retirement income commensurate with their contributions, which can be at odds with a view that a retirement income system should reduce inequality. Other possible interpretations of equity are that individuals should have the same minimum income or the same equality of opportunity to save for retirement. Across different cohorts of retirees, equity could mean that retirement income arrangements should deliver the same outcomes to individuals over time.<sup>3</sup>

Policy makers may have other bespoke objectives in mind. Such objectives may reflect societal priorities or the need to address a particular policy issue. For example, the objective of maintaining a standard of living after the death of a spouse may be relevant to systems with a strong focus on the survivor functions of retirement income systems.<sup>4</sup>

In practice, how OECD countries set adequacy objectives varies. Some countries have objectives for the whole of the retirement income system. For example, in Chile, the objective for the whole system is both to ensure that individuals maintain a similar standard of living during their active work and retirement stages and to eliminate poverty among the elderly and disabled. Some countries have different objectives for different components of the overall retirement income system. In Canada, the public policy objective of the Old Age Security programme (a means-tested flat-rate pension) is to provide a basic level of retirement income regardless of work history for all Canadians 65 and over. The Canada Pension Plan (CPP) (a public defined benefit scheme) and the CPP enhancement provide a basic level of earnings replacement for workers. While it is not formally stated, the public policy objective of private occupational and personal plans is to encourage and assist Canadians to save to supplement other pension income to achieve their retirement goals.

Finally, having objectives helps guide policy making by providing context for decisions while also clarifying what is within and outside the scope of government support for retirement. Objectives provide a rationale for retirement policy development and reform. But having clear objectives also makes it possible to set boundaries on government support for retirement provision. The latter point is particularly salient when it comes to funded and private pensions, as policy makers may wish to limit financial incentives for retirement savings to what is necessary to achieve their objectives. For instance, for an objective of maintaining individuals' standard of living in retirement, the government's focus would be to make policies that help people achieve an income that smooths their utility into retirement. The counterpoint is that government support is limited to just what is needed to maintain a standard of living and not more.

## **Calculating indicators**

Indicators quantify the adequacy of retirement incomes with respect to a particular objective. They aim to represent the incomes of retirees using simple measures such as projected incomes or ratios of income replacement. Calculating indicators of potential retirement income starts with projecting income trajectories over individuals' working lives and over retirement. Then, using those projections, different indicators can provide information about adequacy depending on the objective.

### *Projecting the retirement income that underlies adequacy indicators*

There are two main approaches to projecting incomes over working life and retirement. The first approach involves projecting the incomes of pre-defined hypothetical individuals on a case-by-case basis. These projections typically depend on assumed individual characteristics, assumptions about labour market and retirement scheme parameters, and policy settings. For example, the hypothetical individual might be a person who enters the workforce at age X, works in a full-time job for Y years earning the median income, and has a life expectancy of Z years. The person might have a defined contribution pension plan, contribute at the default rate, and choose a default investment option. The model would take all this information, as well as retirement policy, and would calculate the individual's incomes for every year of their working life and retirement. The income projections would then be the basis for calculating adequacy indicators. This approach is a rough but useful guide as to what is the most likely retirement income benefit under given assumptions. Repeating the analysis for different hypothetical individuals can also improve the representativeness of this approach.<sup>5</sup> Notwithstanding, this approach does not typically provide information to the level of detail necessary to approximate a population of interest.

The alternative is to use a representative sample of individuals or actual population data to build a model that represents the retirement income system or scheme. Such a model would effectively be a scaled-up version of the hypothetical individual model. It provides a richer source of information about the heterogeneity of possible adequacy outcomes because the base data would capture important variability such as different demographic characteristics, work arrangements, and household types. Such an approach would be particularly important in countries where some pension policies are set at the company or sectoral level, leading to significant heterogeneity in plans. The approach can give policy makers a more comprehensive understanding of adequacy outcomes of the system as a whole by capturing diversity and making it more suited to the purpose of assessing overall adequacy. It can also bring to light system vulnerabilities not evident when analysing individual hypothetical cases. However, a key challenge of using these models is that they can be opaque, cumbersome to build and understand, and harder to communicate. They are also more complex, making it more difficult to isolate the effects of different policies or assumptions.

It is also important to account for uncertainty under either modelling approach. Retirement income projections often apply simplifying assumptions. For example, that individuals have stable work patterns and stable contributions to pensions, that they experience average macroeconomic outcomes and have rational behaviours. Many projections also tend to assume that people purchase longevity protection products such as annuities, or alternatively, that they self-annuitise in a rational manner. These assumptions are more in line with political ambitions than reality, which is very uncertain. Retirement incomes can turn out to be less than what a typical full career worker with stable contributions would enjoy, for many reasons. They might have career breaks, spend some time being self-employed (and therefore not contributing to an occupational retirement scheme), draw down savings due to exceptional circumstances, make poor investment choices, lose assets in a relationship breakdown, become ill or disabled, mismanage their finances after taking their pension as a lump sum, among others.

The best way to account for this uncertainty in a model is to allow income projections to mimic the randomness of the real world (a stochastic approach). Accounting for randomness in a model of adequacy

makes it possible to obtain information about a range of possible outcomes for future retirement incomes and their likelihoods.<sup>6</sup> As such, an adequacy model can account for the following categories of risk:

- Financial risks regarding uncertain returns on asset classes, inflation, and interest rates.
- Demographic risks, which include uncertainty about mortality, fertility, life expectancy, and life expectancy improvements.
- Labour market risks, reflecting uncertainty about income levels, spells of unemployment, the incidence of non-standard work, retirement age, and real wage paths over individuals' careers.
- Behavioural risks, which include uncertainty about individuals' or employers' behaviours with respect to saving for retirement, such as take-up of retirement products, contribution levels, or investment choices.

A model of retirement incomes can account for the randomness of some or all of these variables to come up with expectations about the future. Analysts tend to have a broad idea of the likely distributions of these risks, whether those distributions are based on historical results or judgements about the future. For example, historical returns on assets or historical rates of take-up of voluntary products can be good bases for distributions of unknown variables, but should also be adjusted in line with expectations. Once they are estimated, these distributions can be used to generate random outcomes in simulations of individuals. In practice, if policy makers use the case-by-case approach of analysing hypothetical individuals, they can run multiple simulations of the same hypothetical individuals, allowing unknown variables to change with each simulation. The resulting range of potential income trajectories can in turn inform confidence intervals around projections. Alternatively, in a model that uses a sample representing a population, uncertain variables can be assigned from the probability distributions at random to different individuals. If the sample is large enough, the result would be a model that both captures the heterogeneity of a population and the randomness of uncertain outcomes.

A challenge in some countries is how to account for coverage in this framework, particularly for systems with voluntary private pensions. In many OECD countries, coverage is seen as a separate issue to adequacy. The approach discussed in this section aims to combine adequacy and coverage into a single framework, so countries with voluntary pensions would treat coverage as another uncertain variable in a model projecting future pension incomes. In that respect, within the same model, some individuals would have values attributed to their private pension, while for others, that amount would be zero. If people who are not covered by private pension plans do not meet overall target replacement rates then that would be explicitly accounted for in the model and therefore in an assessment of overall adequacy outcomes.

Scenario testing is also an important feature of projecting future retirement incomes. Analysts can have a good idea of what their expectations for the future might be - as a central estimate or as a distribution - but scenarios of unexpected or unlikely outcomes are also important to consider. For example, an analyst might expect investment returns to be X% on average, but may wish to model a scenario where returns are significantly lower. These scenario tests are an important part of testing adequacy, since history has shown many cases of forecasters having underestimated downside risks.

### *Types of indicators of retirement income adequacy and sources of variations in calculating them*

There are different indicators that can provide information about retirement income adequacy, depending on policy makers' objectives. Calculating these indicators relies on the different projections of working life and retirement incomes described earlier.

Objectives that aim for a fixed consumption standard in retirement (whether that is a basic subsistence standard or a comfortable standard) tend to have the same indicator. That indicator is effectively the expected or hypothetical retirement income that an individual would have in retirement, and can be assessed with reference to targets for adequacy directly.

For the objective of maintaining individuals' living standards in retirement relative to working life, the most common indicator is the retirement income replacement rate. In theory, the income replacement rate is the percentage of pre-retirement income that an individual needs to smooth consumption, and by extension, utility, as they move from working life to retirement. The replacement rate is attractive because of its conceptual simplicity (Box 2.1). It compares income in retirement to income before retirement, net of taxes:

$$\text{Replacement Rate} = \frac{\text{Retirement income}}{\text{Pre-retirement income}}$$

### Box 2.1. The income replacement rate

The income replacement rate is a useful indicator, but views on how to calculate it can diverge.

The numerator of the replacement rate represents post-retirement income. Calculating this figure requires decisions including which income sources to include in the calculation. The replacement rate could consider post-retirement income from one of the components of the whole retirement income system, or cumulative income from many components. It might include personal savings, such as non-mandatory savings or non-monetary assets (such as in Biggs and Springstead (2008<sup>[2]</sup>)). Some studies include imputed rent (such as Munnell and Soto (2005<sup>[3]</sup>)) or the drawdown of housing wealth. Their inclusion can significantly affect the replacement rates calculated in an adequacy assessment.<sup>7</sup> There can also be different possible measurement periods for the numerator, such as the first year of retirement or on average over the retirement phase. The latter means that the calculation would explicitly account for the way retirement incomes change over time.

The replacement rate denominator represents an individual's pre-retirement standard of living. There are different possible measurement periods for the denominator. Some approaches use final earnings, on the basis that individuals might wish to replace the earnings they enjoyed immediately before retirement. However, final earnings are often not appropriate if individuals wind down work in the final years of working life.<sup>8</sup> This is why some replacement rate calculations take the average of a certain number of pre-retirement years. Some studies use career-average earnings, while others average years that they characterise as "peak" or "permanent" earnings (Larochelle-Côté, Myles and Picot (2008<sup>[4]</sup>) and Smith (2003<sup>[5]</sup>)). There is ample evidence in the literature that working life earnings are quite volatile for some individuals, making it hard to pinpoint any narrow measurement period as being truly "representative" of a pre-retirement standard of living.<sup>9</sup> This issue is particularly salient when empirical data is used to calculate a replacement rate, as these complexities tend to manifest in real-life data more than in hypothetical scenarios that are usually constructed with simplicity in mind. In a relatively simple case of a hypothetical individual with a stable career and an income that increases broadly in line with wages in the economy, the calculation can be straightforward, like taking the average of an individual's full working life as the denominator.<sup>10</sup>

Another decision is whether to adjust historical earnings to earnings in the year of the analysis by indexing them to inflation or to wage growth. This choice depends on what the denominator is supposed to represent in the analysis. Using inflation indexed earnings assumes that people are interested in replacing lifetime income in purchasing power terms, while wage indexed earnings assume that earnings during working life should be adjusted to the standard of living at the end of a person's career (OECD, 2014<sup>[6]</sup>).

Indicators that measure the degree of equity of a retirement income system can adapt existing practices for measuring the fiscal progressivity of income to the context of retirement income. For example, indicators can compare retirement income between individuals at different points of the income distribution, different groups of interest (such as by gender), different generations, and so on. The calculations can also depend on assumptions like how assets would be drawn down in retirement.

Indicators of adequacy can vary depending on the methodology used and the assumptions behind the calculations. Table 2.1 summarises different indicators of adequacy for different objectives and assumptions, and variations on their calculations.

**Table 2.1. Examples of indicators and potential sources of variation**

Objective	Examples of indicators	Potential sources of variation in the calculation
Alleviating poverty / achieving a basic standard of living	Net projected retirement income	<p>Assumed trajectory of any drawdowns from DC accounts depends on assumptions around timing of withdrawals or purchases of retirement products.</p> <p>Retirement income can be calculated separately for each retirement year, or using a single figure that reflects the average deflated value of income from all retirement years. Choice of deflator can vary.</p>
Individuals maintain their pre-retirement standard of living in retirement	<p>The theoretical income replacement rate, calculated as retirement income expressed as a percentage of pre-retirement income.  <math>\text{Replacement Rate} = (\text{Retirement income}) / (\text{Pre-retirement income})</math></p> <p>Gross and net pension wealth measures, calculated as the future discounted flows of pension benefits relative to pre-retirement earnings</p>	<p>The numerator can depend on which income sources are included in the calculation (for example, one pillar of the system or the total of all pillars; whether to include imputed rent and drawdowns of personal wealth or housing wealth).</p> <p>The denominator measurement period can vary (for example, final earnings, peak earnings, average earnings, etc.)</p> <p>Historical earnings can be adjusted by indexing them to inflation or by indexing them to wage growth.</p> <p>The replacement rate can be calculated separately for each retirement year, or using a single figure that reflects the average deflated value of all retirement years.</p> <p>Assumed trajectory of any drawdowns from DC accounts depends on assumptions around timing of withdrawals or purchases of retirement products.</p> <p>The discount rate to calculate the present value of future flows of pension benefits.</p>
Individuals achieve a desirable or comfortable standard of living	Net projected retirement income	<p>Assumed trajectory of any drawdowns from DC accounts depends on assumptions around timing of withdrawals or purchases of retirement products.</p> <p>Retirement income can be calculated separately for each retirement year, or using a single figure that reflects the average deflated value of income from all retirement years. Choice of deflator can vary.</p>
Equity of the pension system	Standard measures of inequality, including: ratios of individuals' incomes at different points of time or different points of the income distribution	<p>There can be differing views on what equity should mean, such as: equity between income groups, between genders, intergenerational equity, how commensurate retirement income should be with contributions, etc.</p> <p>Pre- and post-retirement income can reflect a single year or the average of multiple years.</p> <p>Assumed trajectory of any drawdowns from DC accounts depends on assumptions around timing of withdrawals or purchases of retirement products.</p>

Note: DC means defined contribution.



It is important to reinforce that the indicators discussed refer to ones that policy makers could calculate using micro-level models. Namely, these could be models of hypothetical individuals' income trajectories over time, or models that project incomes for each individual in a population dataset or a representative sample. In both types of models, the indicators refer to unique individuals. This stands in contrast to the approach of using aggregate measures of retirement income (sometimes called quasi-replacement rates), which rely on economic aggregates to compare income in retirement to income before retirement. These aggregate measures often feature in the literature on retirement adequacy, and the three most common are:

- The *aggregate replacement rate*, which compares the income situation of two generations, one representing a generation before retirement and one after retirement. For example, the European Commission calculates the aggregate replacement rate as the median individual gross pension income in early years of retirement (people aged 65-74) to the median individual gross earnings of late career workers (people aged 50-59).<sup>11</sup> Förster and Mira d'Ercole (2005<sup>[7]</sup>) offer a variation on this calculation, comparing the mean disposable income of persons aged 66 to 75 with the mean disposable income of persons aged 51 to 65.
- The *benefit ratio*, which is a measure of the pension system's generosity at a macro level. It compares average pensions to average earnings in the economy. For example, Bongaarts (2004<sup>[8]</sup>) and the European Commission (2017<sup>[9]</sup>) calculate the benefit ratio as the average public pension benefits per pensioner to average earnings per worker.
- The *gross average replacement rate*, which compares the average first pension of those who retire in a given year to the (economy-wide) average wage of people at the point of retirement. It is a measure of the standard of living at the time of transition to retirement (see, for example, European Commission (2015<sup>[10]</sup>)).

While these aggregate level measures are useful indicators of the overall performance of retirement income systems, particularly for the purposes of cross-country comparisons, they can lack the detail needed to understand the causal link between policy and adequacy. When assessing the adequacy of retirement income systems for policy making purposes, indicators of adequacy should not simply give information about overall outcomes. Rather, indicators should make it possible to explore why those outcomes arise and investigate individuals of interest.

### ***Setting retirement income adequacy targets***

Targets represent the level of an indicator (such as income level, replacement rate, or measure of equity) at which an adequacy objective is achieved. For any indicator to be meaningful, it needs to be compared with a target that is calculated on the same basis. From the perspective of policy makers, targets for individuals or groups of individuals would be what is broadly appropriate given their circumstances. This is a cruder standard than what individuals would normally judge to be appropriate for themselves, but the purpose is to attain an estimate that is sufficient to guide policy. The aim is not for policy makers to treat the targets as binding (although they can choose to do so), but rather, as useful tools for understanding and assessing the adequacy of a retirement income system.

#### *Principles for setting adequacy targets*

The process of setting adequacy targets should be grounded in certain principles in order for them to be useful reference points for assessing retirement income adequacy. Namely, effective targets are ones which are impartial, based on evidence pertaining to a particular jurisdiction, and, where relevant, tailored to different types of individuals or stages of retirement.

Targets should be based on an impartial evidence-based analysis of the retirement income needed for individuals to meet a particular objective. An independent entity, such as an independent taskforce or

academic body, could conduct an impartial assessment. The evidence that could underlie adequacy targets can include survey data on working individuals' expectations for their future needs or current retirees' consumption patterns or incomes. However, an additional layer of judgement is often needed. For instance, people can be quite good at gauging their expected or desired consumption in retirement based on their current lifestyle pattern, but they are not typically as skilled at anticipating unexpected costs, such as out of pocket health care costs, mobility aids, or aged care expenses. Existing retirees' consumption or income data can also be reliable when it is supplemented with key qualitative information. Starting with information about consumption patterns makes it possible to reverse engineer income needs as a percentage of pre-retirement income. However, for consumption levels observed in the data to be appropriate, there should be enough qualitative information to show that the individuals represented are not income-constrained (or alternatively, not over-consuming). The alternative approach is to use information on income, rather than consumption, as a starting point. But again, that would only be suitable if it contains enough information to be sure that individuals in the data achieve a retirement income that meets the adequacy objective. As such, survey information is most suited to this type of analysis. That said, recent developments in financial technology suggest that algorithms that leverage big data are on track to help provide more customised estimates of retirement income needs.<sup>12</sup>

Targets should reflect a jurisdiction's own experiences. This is important to note because adequacy studies often draw on rules of thumb or studies based on the experience of different countries. But no single retirement target could ever account for the variation in policies and circumstances across jurisdictions.<sup>13</sup> Namely, in-kind benefits such as health care, social services, and long-term care affect retirement income targets and can vary significantly by jurisdiction. While academic studies or rules of thumb based on findings in other jurisdictions can be informative guides, setting effective targets calls for an assessment that is specific to the context.

Targets should be tailored to different types of individuals or households, and can depend on the stage of retirement. There is rarely a suitable 'one size fits all' standard for adequacy. This is why adequacy targets should account for a population's heterogeneity to a reasonable extent. A common example of accounting for heterogeneity is by having higher replacement rate targets for lower income people. But there are also other important sources of potential variations. It is often appropriate to have different targets for singles and couples, and homeowners and non-homeowners, even when it comes to basic subsistence standards. Household composition can also be important. For example, households with children could have a smaller optimal replacement rate than households without children if some consumption during working life was devoted to children.<sup>14</sup> Targets can also vary over the course of individuals' retirement, if there is sufficient evidence that retirees' income needs change over time.<sup>15</sup> In some countries, individuals need to prepare for greater out-of-pocket healthcare costs or costs of aged care facilities as they get older. If that is the case, retirement income targets might need to increase over the course of people's retirement years. But there is also evidence that retirement income needs can naturally fall over time, although there is still no consensus on the matter (Box 2.2). Notwithstanding the accuracy that comes with greater granularity of subject and retirement phase, it is possible for these efforts to make assessing adequacy unwieldy. To prevent the process from becoming too burdensome, policy makers should limit the categories and time dimensions of targets to what is needed to sufficiently assess adequacy for policy making.

## Box 2.2. The Retirement-Consumption Puzzle

Retirees' consumption habits over time are an important dimension of retirement income adequacy, but they continue to be a matter of debate. According to the permanent income hypothesis, forward-looking agents smooth their marginal utility of consumption across predictable income changes, one of which is retirement. But instead of rationally planning their retirement savings as the life-cycle model suggests, researchers in some countries have observed cases of declines in consumption in retirement, at least for some income groups, coining this phenomenon the 'retirement-consumption puzzle'. They have suggested three main possible explanations for this effect: a reduction in work-related expenses, the substitution of home production for market expenditures, and income constraints or the expectation of income constraints.<sup>16</sup>

Some research finds that the first two conditions alone cannot explain income drops in retirement and that only income constraints can account for the magnitude of expense declines. Bernheim, Skinner and Weinberg (1997<sup>[11]</sup>) conclude that most individuals experience a surprise upon retirement by discovering that their resources are insufficient to maintain their standard of living, and adjust their consumption in response.<sup>17</sup> Munnell, Rutledge and Webb (2014<sup>[12]</sup>) suggest that individuals tend to maintain their pre-retirement spending when they first retire, but then cut back sharply thereafter. They suggest the reason is that people could lack adequate resources to maintain their initial levels of consumption throughout their retirement. Banks, Blundell and Tanner (1998<sup>[13]</sup>) found similar results for the United Kingdom, concluding that with retirement, spending declined more rapidly than could be explained by a simple life-cycle model. Smith (2004<sup>[14]</sup>) had slightly more nuanced results for the United Kingdom, finding that how spending and wellbeing changed at retirement varied depending on income groups and whether retirement was voluntary.<sup>18</sup>

However, over time, some researchers started to draw the distinction between consumption and expenditure, arguing that market expenditure can decrease while consumption stays the same, in line with the explanation that people substitute home production for market expenditures.<sup>19</sup> That is, retirees might economise through more efficient shopping and home production since they have more time to do so, but would still consume at the same level.

Academics have analysed the decline in food expenditure relative to consumption to explore this question, with mixed findings. Aguiar and Hurst (2005<sup>[15]</sup>) found that there was no decline in actual food consumption, but rather spending on food by substituting time for expenditure in the United States. Smith (2004<sup>[14]</sup>) found a similar result for the United Kingdom, although in that study the reduction in food expenditure in retirement was only evident for individuals who retired involuntarily.

Subsequent studies added even more nuance to the results. Hurd and Rohwedder (2008<sup>[16]</sup>) found that some US retirees experience upward sloping consumption profiles in retirement and that declines in spending were associated with unexpected health outcomes for lower income individuals.<sup>20</sup> Binswanger and Schunk (2012<sup>[17]</sup>) suggest that one explanation of increasing spending profiles for higher income individuals may be that some people find postponing consumption (e.g. in the form of traveling) until retirement as a complement to leisure more desirable.

### *Examples of adequacy targets in OECD countries*

Government and research organisations' practices across OECD countries provide examples of setting adequacy targets in practice. However, such targets tend to be published more commonly by research and industry bodies than by governments. The most commonly-used benchmark in the UK literature is that which the Pensions Commission, an independent body appointed by the government, put forward in 2004. This benchmark consists of a set of replacement rate thresholds for individual gross earnings that depend

on an individual's pre-retirement earnings, in line with the view that higher income earners require lower replacement levels to maintain their standards of living in retirement (Table 2.2).

**Table 2.2. Adequacy thresholds published by the Pensions Commission**

Earnings	Target replacement rate (Gross)
<£9,500	80%
£9,500-17,499	70%
£17,500-24,999	67%
£25,000-39,999	60%
£40,000+	50%

Source: Table G.1, Pensions Commission (2004<sup>[18]</sup>)

There are also examples of qualitative information from surveys informing adequacy standards. As an example of consumption standards that are based on the value of a basket of goods, the Association of Superannuation Funds of Australia publishes different retirement consumption targets by defining each item required to achieve a particular standard of living, and their cumulative value yields a total expenditure level (ASFA Research and Resource Centre, 2018<sup>[19]</sup>). The association publishes different targets for singles and couples, at both a “modest” and “comfortable” standard. Binswanger and Schunk (2012<sup>[17]</sup>) also used survey questions that were explicitly framed in terms of retirement preparation. They conducted a survey in the United States and in the Netherlands and used the responses to come up with estimates of desired spend ratios as well as absolute minimum spend levels, calibrated by income quintile.

Other research bodies embed tailored targets into sophisticated models of retirement income adequacy. In the United States, the Center for Retirement Research at Boston College has a model that measures adequacy against target replacement rates that vary based on household type and income group to come up with a National Retirement Risk Index (NRRRI) (Munnell, Webb and Delorme, 2006<sup>[20]</sup>). Their target replacement rates use a life cycle savings model that assumes households spread their income such that they have the same level of consumption in retirement as they had before they retired. Conversely, a Canadian NRRRI identifies a risk in assessing adequacy as being that there is no universal replacement rate threshold that could adequately meet everyone's circumstances, even after breaking the analysis down by income group (Macdonald et al., 2011<sup>[21]</sup>). It therefore circumvents this shortcoming by directly comparing each individual's consumption before and after retirement. Each individual in the model effectively has their own personalised target. Finally, the Employee Benefit Research Institute in the United States does something similar to the US and Canadian NRRIs, but calculates a benchmark using average retirement expenditures an individual would need using a deterministic allocation of expenses from the Consumer Expenditure Survey based on age and income (VanDerhei, 2015<sup>[22]</sup>).

### *Assessing arguments against adequacy targets*

A common argument against setting targets for retirement income is that doing so can create an accountability burden. In other words, having a target, and publicising it, can put pressure on governments to deliver on the public expectations a target creates. Being held accountable for shortcomings in retirement income adequacy is a legitimate concern, but should not deter policy makers from having retirement income adequacy targets at least for internal policy making. Expectations regarding adequacy exist anyway, and communities are likely to respond to feelings that a retirement income system is not delivering on their expectations. In practice, policy makers can send a message, intentionally or otherwise, about what is appropriate for individuals when they set retirement policy parameters. For instance, when policy makers set a mandatory contribution rate for funded retirement income schemes, the public might interpret this as the rate that would yield them an adequate retirement income.<sup>21</sup> Therefore, the public might hold governments accountable for any perceived shortfalls in retirement incomes, whether or not

that perception is grounded in a publicised target. Choosing to engage in a public discussion on adequacy targets can help governments guide the narrative on adequacy. Should they choose not to publicise targets, targets would still be essential to conducting internal assessments of adequacy and deliberating on policy.

The other argument against having targets is that it is not the role of governments to set adequacy targets, especially in jurisdictions with a greater focus on individual responsibility. The counterpoint to such argument is that in reality, most people may not make an assessment of retirement income adequacy for themselves. Some people expect retirement income policy design to do the work for them while others are simply unwilling or unable to prioritise retirement. While it is true that individuals have a better grasp of their own financial circumstances than government bodies do, policy makers have a key role in ensuring people receive incomes in retirement, even in jurisdictions that have voluntary funded retirement arrangements. Having a funded retirement system without due consideration to the fact that people can generally have low financial knowledge about their needs for retirement has at times resulted in what people perceive as a “retirement savings gap”, which can lead to dissatisfaction with governments and pressure to reform. Instead, having targets makes it possible to assess and understand the adequacy of a retirement income system, helping governments anticipate and respond to any shortcoming in a system.

### ***Assessing adequacy with respect to policy goals***

An assessment of the overall adequacy of retirement income systems should refer to policy goals. Projecting retirement incomes and comparing results for hypothetical individuals with the target that is suitable to them is only part of an adequacy analysis. From the perspective of policy makers, the next part is evaluating those predicted outcomes, viewed cumulatively for a retirement income system, with goals for that system.

Policy makers should set overall adequacy goals for a retirement income system by quantifying what it takes to meet an adequacy objective. In this sense, policy goals refer to overall results, as opposed to targets which refer to what is broadly appropriate for individuals, at a micro level. There are different ways policy makers could quantify these goals. For example, the percentage of people that should achieve their retirement income target; the tolerable average adequacy shortfalls or shortfalls in rare scenarios (such as 5% or 1% of the time); equity measures in aggregate, etc. To illustrate, suppose a policy maker has two objectives: ensuring that individuals can maintain their standards of living in retirement and avoiding poverty in retirement. They might treat these objectives as met if 80% of individuals reach the replacement rate target that is appropriate to them, and, say, 100% of the retired population exceeds the poverty line.<sup>22</sup> From the perspective of policy makers, these achievement rates would be their goals for the system.

Policy makers’ decisions regarding what these broader goals could look like would reflect their tolerance for risk and tolerance for potential adequacy shortfalls. In the example above, the counterpoint to having 80% of individuals reach their replacement rate target is that policy makers can tolerate approximately 20% of the population not achieving their target replacement rate. The potential for adequacy shortfalls and risks is not just part of defined contribution plan policies, but also where there is a promise backing a defined benefit scheme, as there is no surety that workers will meet the contribution years to achieve a particular replacement rate. While accepting a certain degree of risk or a potential rate of adequacy shortfall is generally the undesirable side of policy making, it is often inevitable, particularly when policy makers aim for objectives that exceed the standard of a basic subsistence. Retirement policies should aim to reduce these risks, but eradicating them entirely can simply be fiscally unsustainable and in practice impossible, since individuals are different and public policy can rarely cater to everyone’s needs. In some jurisdictions, policy makers may also prefer to give individuals free choice to plan for their retirement, possibly increasing their tolerance for adequacy shortfalls.

Policy makers should bear in mind long-term consequences when deciding upon their adequacy goals. Weighing the need to provide adequate incomes in retirement against other competing considerations,

such as financial sustainability or a preference to give individuals free choice in their retirement, is a careful balancing act. Excessively sacrificing overall adequacy for the sake of other priorities can lead to public pressure to boost retirement incomes once individuals retire and discover their incomes are insufficient.

After conducting an adequacy assessment that finds that current policies are likely to yield retirement incomes which, considered together, fall short of their overall adequacy goals, policy makers may wish to know what policy settings would yield the desired goals. Policy makers have a range of potential policy options within their control like mandatory contributions, retirement ages, investment strategies, matching contributions, tax settings, and so on, to affect retirement system outcomes. By altering these settings, and repeating the adequacy assessment to see how overall results change, policy makers can get an idea of what it takes for a retirement system to achieve their policy goals. This process can often be iterative, and can involve testing how different combinations of policy reforms affect outcomes overall. However, it is a useful way to understand different policies and settle on those that meet the goals policy makers set for themselves.

In practice, how OECD countries conduct adequacy assessments varies. Some countries track indicators without necessarily comparing them to targets. Some countries have clear targets and policy goals against which they assess the adequacy of their pension systems. Some conduct regular assessments of their retirement income systems, and others have conducted in-depth studies to assess the adequacy of their systems in line with the framework discussed here (see, for example, the Icelandic example in Box 2.3). Notwithstanding the efforts of different countries, the framework presented above aims to guide policy makers to learn from best practices across OECD countries to continue to develop their approaches to assessing retirement income adequacy.

### Box 2.3. Iceland's example of assessing retirement income adequacy

The Icelandic Financial Supervisory Authority conducted a review of pension savings in Iceland to examine and assess the private pensions' contribution to retirement readiness in 2014 (The Financial Supervisory Authority in Iceland, 2014<sup>[23]</sup>).

The project started with collecting data and modelling future pension accruals for individuals in a representative sample. The sample data included about 90 000 pension fund members. It was based on administrative datasets of occupational private pension plans and personal pension plans. Matching using personal identifiers made it possible to come up with total accumulated pension rights for each individual in the model. The model also relied on data from the tax authorities on housing wealth and outstanding mortgage balances. The model projected future retirement incomes while accounting for uncertainties in variables such as retirement age, unemployment periods, interest rates, etc.

The study compared projected retirement incomes with targets. The target for income from the Social Security System was the minimum subsistence income set by the Social Assistance Act 2007, and the target for income from the mandatory occupational pension system was a 56% replacement rate.

The analysis found that the overall median replacement ratio for all individuals in the sample was 64%, but a significant proportion of the sample, 32%, does not reach the 56% target (Table 2.3).

**Table 2.3. Replacement rates from occupational plans and proportion of people receiving less than 56%**

Age	All	35-36	40-44	45-49	50-54	55-59	60-64
Replacement rate (career-average wage)	64%	64%	64%	64%	64%	63%	61%
% of people receiving less than 56% of final wage	32%	27%	29%	31%	33%	36%	42%

Source: Table 5.1 of The Financial Supervisory Authority in Iceland (2014<sup>[23]</sup>)

The analysis examined different income groups, gender, and private/public employment (Table 2.4).

**Table 2.4. Replacement rates from occupational plans and proportion of people receiving less than 56%, by income group, gender, and private/public sector**

	Low income	Medium income	High income	Men	Women	Public Sector	Private Sector
Replacement rate (career-average wage)	59%	66%	62%	62%	64%	84%	59%
% of people receiving less than 56%	45%	27%	34%	36%	34%	9%	41%

Source: Table 5.2 of The Financial Supervisory Authority in Iceland (2014)<sup>[23]</sup>

The analysis then proceeded to consider the combined outcomes from all pillars of the retirement income system, finding that when they are considered together, most people met the 56% target replacement rate. Finally, the analysis conducted a sensitivity analysis, repeating the exercise under more pessimistic and more optimistic scenarios. For example, the pessimistic scenario featured lower returns and a lower retirement age, as well as more pessimistic macroeconomic assumptions. This significantly decreased expected replacement rates.

Based on this exercise, the Icelandic authorities were able to uncover key challenges to retirement income adequacy. For example, people with fewer than 40 years of contributions were at a disadvantage, as were people covered by defined contribution schemes relative to civil servants' defined benefit schemes.

## 2.2. Policy guidance

This section presents guidance for policy makers. This chapter already discussed how the framework for assessing retirement income adequacy calls for having objectives and targets, calculating adequacy indicators, and making an assessment of retirement income policies bearing in mind overall policy goals. The guidance that follows offers practical steps policy makers can take in order to implement this framework.

### ***Collect the necessary information to assess retirement income adequacy***

Collecting the right information is an important first step in both setting targets and projecting future retirement incomes. Targets can draw on data on existing retirees' income or consumption patterns, coupled with qualitative information about whether those individuals are income constrained or over-consuming, or qualitative information about working individuals' expectations for their future needs. Survey data is often the best source of this type of information, where it exists. Where it does not, policy makers or researchers can design bespoke surveys with the objective of collecting this information and determining the right adequacy target for people.

Policy makers should have access to the data about pension assets and entitlements across the population, as well as enough information to inform assumptions for projections, in order to project future retirement incomes and conduct an assessment of their adequacy. Administrative data usually provides enough detail to project retirement income adequacy. Ideally, governments would be able to collect administrative data to a level of detail that makes it possible to reliably project individuals' future working life incomes and retirement incomes, including entitlements across different providers or schemes. However, this information is not always available or may be administratively difficult to collect. This is a common reason for not assessing the adequacy of retirement income, particularly in funded and private



pensions. For example, providers and sponsors of occupational plans (whether defined benefit or defined contribution) and personal plan providers might not report balances or entitlements to authorities at all. Even if they do, fragmentation of retirement arrangements across employers or professions can sometimes complicate getting a cumulative picture of different individuals' retirement income entitlements. One way around this issue is to mandate reporting by providers and sponsors. That reporting should at least contain basic financial and demographic information such as income, age, and total assets or the value of entitlements. Policy makers should aim to match that information with other administrative data containing further demographic and financial information such as income, years of work, home owning status, and household type.<sup>23</sup>

It is also important for policy makers to collect information about factors that can inform assumptions of future retirement savings and entitlements, such as trends in investments, contribution patterns, and career paths. If policy makers cannot collect administrative data, independent surveys designed specifically with the goal of collecting information to assess the adequacy of retirement income systems is a good alternative to administrative data. The surveys should appropriately represent future pensioner populations, and be conducted regularly. An option is to conduct the survey in conjunction with one that also aims to inform adequacy targets, although the questions for the two components may differ.

### ***Have objectives for retirement income adequacy coupled with a clear communication strategy***

Policy makers should have objectives for retirement income adequacy to ensure retirement income policies are targeted at achieving clear goals. Objectives can refer to the entire retirement income system, with different components performing a complementary role in achieving the same objectives. Alternatively, the objective could refer to individual retirement income schemes or arrangements, always keeping in mind how they may fit in the overall retirement income system. Typical adequacy objectives are to maintain people's standards of living in retirement and to prevent poverty in retirement. Other objectives include attaining a specific budgetary standard (such as a standard for a comfortable retirement) and achieving equity.<sup>24</sup> Having objectives is important because it helps guide policy making by providing context for decisions while also clarifying what is within and outside the scope of government support.

Policy makers should publicise objectives for retirement income systems or schemes, and a communication strategy should support that objective and manage the public's expectations. Objectives that are clear and articulated in a public document or in legislation help ensure that the public dialogue on retirement refers to an agreed goal. However, publicising objectives should not lead to a misconception that the state alone is responsible for adequacy. Outcomes for retirement can still depend on individuals' own circumstances, such as years of work or voluntary contribution rates. This is why publishing objectives should be accompanied by a broader communication strategy about what it takes for those objectives to be achieved. As a simplistic example, government communication might emphasise that a retirement income system will deliver a basic standard of living for all individuals, but will only smooth consumption in retirement for workers who have contributed for enough years. This strategy should also come with guidance for people wishing to improve the adequacy of their retirement income.

### ***Project future retirement incomes while accounting for uncertainty***

Projections of future working life and retirement incomes are a starting point for analysing adequacy. These projections can come in the form of hypothetical test cases or models of a whole income retirement system or scheme. Modelling income trajectories for hypothetical 'typical' individuals or households is useful because the results are familiar and easy to understand and communicate. By repeating the exercise for multiple hypothetical individuals, it is also possible to get an idea of different potential income outcomes. But alone, such analyses would not capture the true heterogeneity of a retirement income system without becoming unwieldy. The alternative is to model a whole retirement income system or scheme using a



sufficiently large and representative sample of individuals or population data. Each individual represented in the model would have separate projections for their retirement incomes, but viewed together, they can give a comprehensive picture of adequacy in aggregate. Results from such models are generally more suited to analysing the diversity of retirement income outcomes.

Retirement income projections should account for risks and uncertainty. Economic, demographic, labour market, and behavioural factors can significantly impact retirement incomes in most funded retirement income arrangements. Any modelling of future retirement income outcomes should account for these risks as much as possible. When modelling adequacy using hypothetical individuals, having confidence intervals that reflect the range of possible incomes with certain probabilities can help communicate the impact of these risks. Confidence intervals can be calculated using the results of multiple simulations of the same hypothetical individual while allowing random parameters to vary. When modelling retirement income systems or schemes using a sample of individuals or population data, randomly allocating values to variables that are uncertain, based on a known distribution, can help produce outcomes that emulate real-life uncertainty. In turn, this makes it possible to assign probabilities to aggregate results. If the adequacy assessment aims to model components of a system with greater employer or individual discretion, the modelling should account for expectations of future behaviours and the risks of different patterns of behaviour emerging.

Policy makers should project retirement incomes by accounting for expected variations, but should supplement that analysis using scenario testing of extreme or unexpected outcomes. A good example of an extreme scenario is the recent market downturn driven by a global pandemic. Even if policy makers can never fully anticipate or quantify the risk of these unexpected scenarios, it is important to at least simulate extreme downside risks and engage in a qualitative discussion of their consequences for retirement adequacy, so informed decisions and contingency plans can be made.

### ***Calculate retirement income adequacy indicators and compare them to appropriate targets***

Calculating indicators of adequacy and comparing them to targets makes it possible for policy makers to assess whether retirement income arrangements are likely to meet objectives. Indicators should be suitable proxies for adequacy objectives. While calculating indicators alone is informative, to be meaningful in gauging adequacy, they should be compared to targets calculated on the same basis as the indicator. The choice of indicator and target depends on one another. What is the most suitable indicator should influence how the target is calculated. However, if there are constraints on the type of information available to determine a target, a different indicator might be needed to analyse adequacy.

Adequacy targets should be guides to policy making and assessment, and not binding requirements. A common reason policy makers cite for avoiding adequacy targets is that they can create an expectation that people's retirement income will meet that target. That is not the purpose of an adequacy target which is designed to assess the adequacy of hypothetical future incomes. Instead, retirement income adequacy targets should be used as a neutral standard or reference point that facilitates decisions on policy making and design. Adequacy targets are, fundamentally, assessment tools, and not binding requirements unless governments treat them as such. Policy makers should use targets for internal policy making and assessment. However, they can choose to also publicise them if that coincides with a careful communication strategy about adequacy and the mutual roles of governments and individuals in achieving targets.

An independent body should advise policy makers on suitable retirement adequacy targets that are based on reliable data and relevant to a particular jurisdiction. It is important for countries to have targets for adequacy that are based on evidence and involve deliberation by an independent entity to ensure the adequacy standard is neutral. Academic panels or independent taskforces can be well placed to do this. It is also important that targets are based on data from a jurisdiction itself. While the international literature

on retirement income adequacy often refers to relative poverty levels, broad rules of thumb, or ‘typical’ replacement rates, retirement income adequacy depends on standards of living, purchasing power, and what in-kind benefits exist in different jurisdictions. For this reason, what would be an appropriate adequacy target in one jurisdiction can provide an indication of what may be an appropriate target in another, but alone is not enough. Ideally, the independent body would use data from surveys that provide clear information about people’s retirement income needs and consumption patterns to come up with targets.

Targets should account for heterogeneity of individual or household circumstances where relevant. Having a single adequacy target for a whole population cannot capture the diversity of circumstances and needs across a population, especially if an adequacy objective refers to more than just achieving basic need standards.<sup>25</sup> Coming up with different targets for different groups of people can improve the accuracy of targets overall. But an extreme application of that view ends with too many targets, one for each individual, which is not the purpose of the exercise. Instead, targets should be calculated for population sub-groups that aim to approximate adequacy in a broad sense. They can therefore be based on material characteristics such as marital status, income group, and homeownership. Calculating different targets for different stages of retirement can help capture the dynamics of retirement where that is relevant. Targets should be reasonable approximations of adequacy for most people without having to be perfect targets for everyone. Notwithstanding, policy makers and analysts relying on these targets should bear in mind the risk of mis-assessing adequacy for some people and the importance of identifying groups at risk.

The process of setting retirement income adequacy targets should aim to anticipate and model future trends that affect retirement adequacy targets. Standards of living, individuals’ needs, and policy environments can change over time. What would have been seen as an adequate level of retirement income in the past might not be adequate today. And what might be seen as adequate today might not be adequate in the future, when the outcome of today’s policy making is realised. Current levels of support for retirees may also simply be unsustainable in the future, if dependency ratios rise and government support programmes become unaffordable. If individuals are likely to bear a greater financial burden in the future relative to today, retirement income adequacy targets for people entering the workforce now should be higher than those of today’s retirees.

While setting adequacy targets can be a conceptually challenging and onerous exercise, there is a good case to dedicate the resources to overcome the difficulties. Communities are likely to respond to a feeling that a retirement income system is not meeting their expectations. While policy makers may have the view that people should plan for their own retirement income adequacy, the reality is that most people *won’t* do that for themselves, and instead tend to rely on the government’s retirement policy design to do the work for them. Setting targets and measuring adequacy with reference to them helps in delivering adequate retirement incomes before shortcomings emerge.

### ***Assess overall adequacy with reference to policy goals and respond***

To determine whether adequacy objectives are being met, overall adequacy outcomes should be considered with reference to policy makers’ goals for a retirement income system. Achieving objectives does not imply that all individuals must have retirement incomes that perfectly meet adequacy targets. This could be unsustainable from a policy perspective. For instance, it may not be feasible to expect government policy to ensure that all individuals experience a smooth consumption when transitioning from working life to retirement. Instead, it would be more reasonable for a retirement income system to deliver on this objective for most people. Policy makers should quantify their adequacy goals to use as a reference point for adequacy assessments of a retirement income system or scheme. For example, policy makers might deem adequacy objectives to be met if a certain percentage of people meet their adequacy target, or if cases of extreme income shortfalls are limited to a certain percentage. These internal deliberations should happen regularly and be part of routine adequacy health checks that help governments optimise retirement policies.

Policy makers should reflect on their own role in retirement income provision, their tolerance for risks of retirement income shortfalls, and competing objectives in quantifying their policy goals. Some countries have a strong precedent for government support for retirement and might therefore have more ambitious policy goals. However, they may need to weigh those goals against sustainability concerns. Other countries place greater emphasis on individual choice, with a culture that promotes autonomy when it comes to retirement decisions, and as such, a reduced role for government. Those countries may have a greater tolerance for expected retirement income shortfalls. However, that tolerance should be weighed against the negative consequences of retirees having inadequate incomes. No matter how governments view their role and balance their objectives, it is important that they reflect on the combination of these factors to acknowledge and quantify their adequacy goals.

Policy makers can consider the outcomes of a retirement income adequacy assessment with reference to these goals and respond accordingly. If the assessment reveals that future retirement incomes are likely to fall below their adequacy goals, policy parameters might need to be changed. Ways to boost retirement incomes are widely documented, and can include increasing contribution rates, retirement ages, or the use of financial incentives. In countries with less emphasis on compulsion, responses might include altering the choice environment. For example, by introducing automatic enrolment or escalation of contributions, matching contributions, having default investment strategies, and reducing pre-retirement leakage of assets. Policy makers can use models of retirement income systems or schemes to reverse engineer the parameters that yield adequacy results in line with their objectives with a given probability. Similarly, such an analysis should be used to make an informed decision of the long-term impact of policy changes and the extent to which they conflict with adequacy goals. This is clearly exemplified by policy responses to the COVID-19 pandemic, where a long-term assessment of adequacy would show the extent to which overall adequacy goals might be compromised by measures that provide short-term relief to individuals (Chapter 1).

It is also important that policy makers consider the outcomes of adequacy assessments for their different objectives in tandem. This is because achieving one objective does not immediately imply that others are achieved as well. A retirement income system that is designed in a way that maintains individuals' standard of living in retirement does not immediately imply that individuals will also avoid poverty in retirement. If an individual's income was low in working life, having a high replacement rate does not mean their income would be above a particular target for a basic subsistence standard of living, despite having a "smooth" consumption profile. On the other hand, a retirement income system that is designed with only the objective of alleviating poverty in mind might fail to meet the objectives of maintaining individuals' standard of living and would be less likely to meet the objective of ensuring people attain a desirable consumption standard. A pension system that is designed to ensure equity may meet no other adequacy objective, and vice versa.

It is important to regularly assess the adequacy of retirement income systems and adjust policies where relevant. Preparing for retirement is a long-term initiative, and reality rarely turns out as models predict. Over time, outcomes for individuals change, as do expectations for the future. And in a rapidly changing world, feedback mechanisms are essential to correct policies and make room for new reforms if outcomes are straying too far from policy goals. This is why policy makers should assess the adequacy of retirement income systems and schemes regularly, conducting reforms or adjusting parameters where necessary. In this vein, it can be helpful for governments to introduce automatic mechanisms that adjust policy parameters in response to regular adequacy assessments. This helps avoid a legislative process for relatively minor changes (such as small amendments to contribution rates). It is also worthwhile for governments to keep track of whether individuals engage with retirement income systems as predicted (for example, by responding to financial incentives for saving). If, over time, it is clear that behavioural responses are not in line with expectations, there can be room to adjust communication strategies and promote other incentives to ensure the system is able to meet its objectives. Policy makers engaging in the adequacy assessment process may also find that disclosing to individuals comparisons of projections with targets is one way to encourage greater engagement with pensions. For example, using dashboards

to convey information about projected income with reference to targets can help people understand their future financial situation. This could induce them to take action, such as contributing voluntarily or engaging with occupational plan sponsors to provide better benefits.

***Monitor adequacy outcomes for groups at risk of retirement income inadequacy and set targeted policies for them***

Policy makers should pay special attention to groups at risk of shortfalls in retirement income adequacy. A tolerance for a small degree of shortfall does not mean policy makers should ignore the risks to certain socio-economic groups being left behind. Most retirement income systems inevitably have people who systematically experience adequacy shortfalls. In many jurisdictions, groups at risk of retirement income inadequacy include non-standard workers, the long-term unemployed, migrants, and financially dependent spouses. But at-risk groups can also include people who exhibit certain behaviours that put them at risk of adequacy shortfalls, as opposed to simply being part of a particular demographic or labour market group. For example, policy makers could pay special attention to individuals who typically invest conservatively when given a choice of investment strategy, individuals who opt out of retirement savings arrangements, or individuals who do not have protection from longevity risk.

Policy makers should identify existing and emerging groups at risk of retirement income inadequacy, track the potential shortfalls they face, and respond where possible. Identifying at-risk groups is particularly important because often simple but bespoke solutions can significantly improve their outcomes. For example, some groups of individuals, such as low income or informal workers, may simply be cut out of tax incentives for retirement saving, to which policy makers can respond with a bespoke solution such as a matching contribution. Other individuals may respond well to nudges or reminders to engage with retirement savings plans, which policy makers can operationalise quite easily. Of course, there will not always be a simple solution to problems for these individuals. But the key is that policy makers are aware of their system's shortcomings and address the retirement challenges of at-risk individuals to the extent possible.

Groups at risk of retirement income inadequacy can also emerge as a result of significant economic events, such as the Great Recession or the COVID-19 crisis. The pandemic has illustrated how a major event can push more individuals into groups at risk of retirement income inadequacy. Unemployment and short-term policies that materialise investment losses or reduce retirement savings, while understandable in the short-term, can have long-term consequences that can jeopardise retirement income adequacy. Policy makers should monitor these long-term impacts and implement policies that minimise negative long-term adequacy effects, coupled with targeted policies over time tailored to groups at risk of shortfalls.

### **2.3. Conclusions**

Setting policies today that ensure the adequacy of future retirement incomes remains a key challenge for policy makers. As defined contribution retirement savings arrangements play a more prominent role in retirement income systems, there is greater uncertainty about what the retirement incomes of the future might look like. It is therefore more important than ever for policy makers to put in place processes that regularly assess the adequacy of future retirement income with reference to their objectives.

This chapter presented a framework for assessing retirement income adequacy. The framework involves, first, having an adequacy objective to define what policy makers and governments intend for retirement income systems or schemes to achieve. Publicising that objective can be beneficial as long as it is coupled with a clear communication strategy that clarifies mutual responsibilities in achieving the objective. Next, it involves calculating indicators based on projections of future retirement incomes that account for real-world uncertainty. Those indicators can then be compared to adequacy targets to determine whether individuals

are meeting adequacy standards and the extent of any shortfalls. Suitable targets are ones which are impartial, based on evidence relevant to a particular jurisdiction, and tailored to different types of individuals. Finally, by considering cumulative adequacy outcomes for a population, policy makers can assess the performance of retirement income systems or schemes with reference to their policy goals. Policy makers should reflect on their own role in retirement income provision, their tolerance for risks of retirement income shortfalls, and competing objectives when determining their policy goals, and respond to findings that existing policies may lead to inadequate retirement income.

To be able to apply the framework, policy makers should first obtain the necessary information to set targets and assess retirement income adequacy. They should conduct adequacy assessments regularly, and should also be prepared to respond to their findings. It is also important to bear in mind that an aggregate assessment of retirement income adequacy often fails to identify at-risk groups, so care should be taken to identify those individuals and specifically respond to adequacy shortfalls for them.

How policy makers might respond to findings of retirement income system inadequacy may vary depending on the structure of retirement income systems and normative views on the role of government in achieving adequacy. But what all countries have in common is that failing to appropriately respond to shortcomings in retirement income adequacy has serious consequences for people in the long term. As such, it is essential that policy makers anticipate these shortcomings and respond before adequacy challenges become too great.

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## Notes

<sup>1</sup> Notwithstanding, it is possible to adapt the approach to assessing the adequacy of retirement income discussed in this chapter to an assessment of current retirement incomes.

<sup>2</sup> This chapter will not discuss the tension between adequacy and non-adequacy objectives, apart from noting the scope for conflict between the two and any consequences for policy. A retirement income system can have many objectives, and not all are concerned with adequacy. Some other goals of a retirement system can be in tension with adequacy objectives. Chapter 1 of the *OECD Pensions Outlook 2018* (OECD, 2018<sup>[34]</sup>) contains a comprehensive discussion of various retirement income system objectives. To illustrate, policy analysts often discuss how retirement income policy design or reform inevitably entails a trade-off between adequacy and sustainability. It is also important to note that some system designs are better suited to meeting certain objectives. However, this chapter takes the system as a given and instead focusses on assessing adequacy with given systems in mind.

<sup>3</sup> This expectation can be seen in practice in countries where it has become clear that current retirees will enjoy a lower standard of living than previous generations of retirees. For examples of how expected



pension income of current workers is below recent retirees' average pension income, see Chapter 3 of the *OECD Pensions Outlook 2014* (OECD, 2014<sub>[6]</sub>).

<sup>4</sup> See, for example, the discussion in Peeters, Verschraegen and Debels (2014<sub>[35]</sub>).

<sup>5</sup> See, for example, the approach taken in European Commission and Social Protection Committee (2018<sub>[24]</sub>)

<sup>6</sup> As an example, previous OECD work presented a stochastic model that explored how uncertainty in pension parameters can affect retirement income from defined contribution pension plans (see Antolin and Payet (2011<sub>[39]</sub>)).

<sup>7</sup> Chapter 2 of *Pensions at a Glance 2013* (OECD, 2013<sub>[42]</sub>) contains a comprehensive discussion.

<sup>8</sup> Of course, there may be some incentives that counter this effect, such as cases of defined benefit pensions that are based on final years of income.

<sup>9</sup> See discussions in Finnie (1999<sub>[25]</sub>) and Beach and Finnie (2004<sub>[26]</sub>).

<sup>10</sup> See, for example, the OECD's *Pensions at a Glance* publication. In the standard OECD pension models, a person's income grows in line with economy-wide average earnings, which means that using the latest and average lifetime incomes will yield the same result.

<sup>11</sup> As an example of the European Commission's use of aggregate benefit ratios, see European Commission and Social Protection Committee (2018<sub>[24]</sub>).

<sup>12</sup> See the discussions in Empower Institute (2019<sub>[36]</sub>) and Safane (2018<sub>[37]</sub>)

<sup>13</sup> As an example, Whiteford (1995<sub>[40]</sub>) discusses the shortcomings of using replacement rates to compare the adequacy of pension income across different countries.

<sup>14</sup> See, for example, the discussion in Scholz and Seshadri (2009<sub>[27]</sub>)

<sup>15</sup> See, for example, the discussion in United States Government Accountability Office (2016<sub>[43]</sub>)

<sup>16</sup> See, for example, Hamermesh (1982<sub>[28]</sub>) and Hurd and Rohwedder (2006<sub>[29]</sub>)

<sup>17</sup> They suggest that this evidence disputes models of behaviour that assume that individuals are rational and forward-looking.

<sup>18</sup> Other studies also point to a more detailed age dynamic for consumption growth. For example, Börsch-Supan and Stahl (1991<sub>[41]</sub>) argue that consumption diminished (and savings peaked) among the "older" old (people over 70) retirees of West Germany. They find that unexpected age and health related consumption constraints account for this effect.

<sup>19</sup> This relates to the theory of allocation of time: that consumers produce commodities by combining inputs of goods and time according to cost-minimisation rules. Therefore, when people have more time, they might substitute away from market expenditure as the relative cost of time falls. See Becker (1965<sub>[31]</sub>).

<sup>20</sup> Hurd and Rohwedder (2008<sub>[16]</sub>) analyse spending change as a function of pre-retirement wealth. They find that in the upper half of the distribution spending was either constant or it increased. For the lower wealth population, they found that a lack of wealth may have required a decline in spending. The decline

was a surprise only in the lowest wealth quartile, but in the second quartile it was fully anticipated. The apparent explanation for most of the decline in the lowest quartile was unanticipated early retirement associated with poor health.

<sup>21</sup> Chapter 5 of OECD (2018<sup>[33]</sup>) discusses how the public can anchor complex decisions to often unsuitable but familiar solutions.

<sup>22</sup> In reality, policy makers would not expect all individuals to have sufficient income for them to avoid poverty in retirement. Rather, policy makers might aim to design pension policy such that most individuals would avoid poverty through their pension income, and the safety net would catch the remaining minority.

<sup>23</sup> For example, the Chilean Superintendence of Pensions, which supervises and regulates the pension system, applies such an approach for its pension projection model, which estimates the number of pensioners in the system and computes their potential benefits. The model is based on a representative longitudinal survey, which is matched to information from administrative data. In particular, the Administrative Pension Histories and the Administrative Database of Affiliates, Contributors, Pensioners and Deceased. Those administrative datasets contain information such as monthly earnings, pension savings, etc. (Miranda, Poblete and Quintanilla, 2012<sup>[38]</sup>).

<sup>24</sup> Equity can also be an objective of a pension system in itself. But it is included as a possible adequacy objective in this chapter because individuals often gauge the adequacy of their own retirement income by looking at how well-off other retirees are, and how well-off previous retirees were. In this sense, equity is an essential part of an analysis of adequacy.

<sup>25</sup> For example, whether a replacement rate target should be the same for low, middle or high income people.



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