Chapter 4

Non-Financial Defined Contribution
Pensions: Mapping the Terrain

Nicholas Barr*

The Backdrop

This chapter offers an assessment of notional defined contribution (NDC) pensions from the perspective of welfare economics, with a brief discussion of management and implementation. The opening section sets out the objectives of pension schemes, the idea of NDCs, and the simple economics of pensions. The second section assesses NDC pensions in terms of policy design. Is the aspect under discussion an advantage? If so, is the advantage specific to NDCs, and is it one of policy design or political reality? The third section briefly discusses the institutional prerequisites necessary if a country is to introduce NDC pensions effectively. The final section offers three conclusions. NDC pensions are not a theoretically dominant policy, but one with pros and cons that need to be compared with those of other designs. The case for NDCs is strongest as part of a wider pension system, rather than as a stand-alone construct. The NDC approach does little to address the central problem of pension finance—the age at which people are first eligible to claim their pension.

Objectives of Pension Schemes

From the viewpoint of the individual, pensions have two purposes:

- Consumption smoothing over the life cycle, and
- Insurance, notably in respect of the longevity risk.

Public policy has additional objectives:

- Poverty relief. This is necessary if someone is poor for his or her lifetime as a whole and, as a practical matter, is needed to address transient poverty.
- Distributional objectives. Governments may also have broader distributional objectives. They frequently wish to protect the pension rights of people with caring responsibilities and they may wish to subsidize the consumption smoothing of people whose earnings are above the poverty line, but not by much.
These four elements are the primary objectives of pensions. The analysis, particularly in the second section, considers the extent to which different types of NDC arrangements do, or do not, contribute to their achievement. There is also an important constraint—sustainability—that recurs in the discussion below.

**NDC Pensions**

The basic idea of NDC pensions is to separate the state pay-as-you-go (PAYG) scheme into two components: a strictly actuarial element (the NDC pension), operating on a PAYG basis but mimicking a funded defined contribution scheme; and a redistributive element financed from general taxation.2

The actuarial element is calculated in the following way:

- A contribution of \(x\) percent of a person’s earnings is credited to a notional individual account: that is, the state “pretends” that there is an accumulation of financial assets.
- The cumulative contents of the account are credited periodically with a notional interest rate.
- At retirement, the notional account is converted into an annuity.

Thus NDC pensions mimic conventional (funded) defined contribution schemes by paying an income stream whose present value over the person’s expected remaining lifetime equals his/her accumulation at retirement.

**QUESTIONS ABOUT THE DESIGN OF STATE PENSIONS**

Policy makers face a series of issues. How large should the state pension be; how redistributive from richer to poorer; and should benefits be defined contribution or defined benefit (defined and discussed shortly)? Further, if a new pension system, such as an NDC arrangement, is introduced, how will the transition be financed? Moreover, there is a range of questions specific to the design of NDC pensions:

**Question 1.** What is the minimum pension? Is it paid in addition to the NDC pension, or does it take the form of a guarantee that is paid only if the NDC pension falls below a predetermined minimum level? If the former, is the minimum flat rate or with an earnings-related element? Is it minimal or larger?

**Question 2.** Is there a maximum NDC pension?

**Question 3.** Is minimum pensionable age unconstrained, with full actuarial adjustment of the pension to a person’s age at retirement? Or is there a legally defined minimum age, with actuarial adjustment for retirement at a later age? And/or is there a minimum age that rises according to some functional relationship with life expectancy?

**Question 4.** Is the accrual rate during working life based on earnings growth per worker, and hence unaffected by unemployment, or on earnings growth in aggregate, and hence lower in years when unemployment is higher? Separately, is the pension formula adjusted for life expectancy? Several NDC schemes have an accrual rate equal to

\[
\text{Rate of growth of the contributions base} = \text{productivity growth} + \text{employment growth}.
\]

Most schemes, being new, include an adjustment for life expectancy.
Question 5. Is the annuity, once in payment, adjusted annually in line with changes in consumer prices, or with real wage growth?

**DEFINED CONTRIBUTION AND DEFINED BENEFIT PENSIONS: A BRIEF COMPARISON**

In a defined contribution (DC) scheme, a person’s pension is an annuity whose size, given life expectancy and the rate of return on pension assets, is determined only by the size of his lifetime pension accumulation. Thus the approach leaves the individual to face the risk that his pension portfolio might perform badly. Under a defined benefit (DB) scheme, often run at the firm or industry level, a person’s pension is based on his wage and length of service. Thus his annuity is wage-indexed during working life, and the risk of varying rates of return to pension assets falls on the employer, and hence on some combination of the industry’s current workers (through effects on wage rates), its shareholders and the taxpayer (through effects on profits), its customers (through effects on prices), and/or its past or future workers, if the company uses surpluses from some periods to boost pensions in others.

The debate between DC and DB pensions is often posed as one between polar opposites, a strictly actuarial DC scheme being compared with a final salary DB scheme. The reality is more subtle, as Diamond (2002, 55–57) points out. Suppose a person’s earnings in a particular year are 70 percent of average earnings that year; call that variable $x$. Call the average value of $x$ over $n$ years, $\bar{X}$, which is thus a measure of the person’s earnings each year indexed by the rate of wage growth. Then $\bar{X}$ is the earnings base on which a person’s pension in a DB scheme is determined. If $n$ relates to earnings in the last year before retirement, the scheme is a final-salary DB scheme. In contrast, if $n$ spans an entire working life, the scheme is a DB scheme in which pensions are based on lifetime contributions compounded each year by the rate of wage growth. In a funded DC scheme, annual contributions are compounded by the return on assets (for short, the interest rate), again over a person’s working life. If the rate of interest and the rate of wage growth are similar, the difference between DC and DB is minor; and the difference is even smaller between a lifetime DB scheme and an NDC scheme with an accrual rate equal to wage growth.

In the limit, suppose that a DB scheme bases benefits on a person’s entire working life; has an accrual rate that is age-related (that is, contributions in early years have a heavier weight, as with compound interest); and offers an annuity rate that is announced only at the time that a person retires. In that case, DB and DC converge.

Thus DB schemes can be very different, and hence have very different economic impacts; the same is true of NDC regimes. The analysis that follows tries to be clear which type of scheme is being compared with which.

**The Simple Economics of Pensions**

A final piece of background before turning to specific assessment of NDC pensions is the simple economics of pensions, which can be confusing because the literature tends to focus on financial aspects such as analysis of portfolios of financial assets. This discussion tries to simplify matters by concentrating on the essential economic issues: namely, the production and consumption of goods and services.

There are two (and only two) ways of seeking security in old age. It is possible, first, to *store current production* by storing part of current output for future use. Though this is the only way that an individual such as Robinson Crusoe could guarantee consumption in retirement, the method in practice has major inefficiencies. It is costly; it does not deal with uncertainty—for example, how one’s tastes or constraints might change; and it cannot be applied to services deriving from human capital, medical services being a particularly
important example. With few exceptions, organizing pensions by storing current production on a large scale is therefore a nonstarter.

The alternative is for individuals to exchange current production for a claim on future production. There are two broad ways in which a worker might do this: by saving part of his wages each week, he could build up a pile of money that he would exchange for goods produced by younger people after his retirement; or he could obtain a promise—from his children, or from government—that he would be given goods produced by others after his retirement. The two most common ways of organizing pensions broadly parallel these two sorts of claim on future output. Funded schemes are based on accumulations of financial assets, PAYG schemes, including NDC schemes, on promises.

Given the deficiencies of storing current production, the only way forward is through claims on future production. Thus the central variable is the level of output after a worker has retired. The point is fundamental: pensioners are not interested in money (colored bits of paper with portraits of national heroes on them), but in consumption—food, heating, medical services, seats at football matches, and so on. Money is irrelevant unless the production is there for pensioners to buy.

The discussion thus far suggests a series of propositions against which an NDC (or any other) pension scheme should be assessed.

- From the point of view of sustainability, the central variable is the level of national output, not the specific method by which pensions are financed. Since NDC pensions per se do not increase output, the main contribution to sustainability is if they facilitate lower pensions, later retirement, and/or an increase in contributions.
- The design of the state scheme matters. If the state scheme is unsustainable, the only solution is to fix the state scheme. Thus a move to NDC pensions may make it possible to reduce pensions to sustainable levels and/or to make it possible to remove or reduce special benefits for particular groups.
- Insurance, consumption smoothing, and poverty relief are all important. A pure NDC pension is concerned only with insurance and consumption smoothing, with implications, which this study explores, for the broader design of a pension system.

Assessing NDC Pensions

In assessing NDCs, it is useful to distinguish different questions:

- Is the particular feature under discussion an advantage?
- Is the advantage inherent in the NDC design or could it be achieved by another arrangement?
- Is the advantage one of policy design or of political reality?

A final question, discussed in the concluding section, is whether NDC pensions are a dominant policy.

Advantages

This section assesses a series of advantages that are claimed for NDC pensions.

ASSIST CLEAR THINKING

It is useful to distinguish three elements of pensions that are often conflated: public or private; PAYG or funded; DC or DB. The NDC approach reminds us that public + PAYG + DC is a possible option: in other words, that PAYG does not automatically mean DB. This reminder is helpful.
FACILITATE DESIRABLE FEATURES OF PENSION DESIGN

NDC pensions facilitate a number of desirable design features.

A flexible retirement age is welfare-improving because it increases the range of individual choice over consumption smoothing. This advantage can, however, be a feature of other types of schemes. In terms of the retirement decision, what is needed is an actuarial relationship between contributions and pensions at the margin, but not necessarily across the entire contributions record.4

A flexible combination of work and retirement, again, increases individual choice between both work and leisure and over the time path of income. Again, however, this is possible with other pension arrangements, such as a state scheme offering defined benefits from the age of 65 but with actuarial adjustment for delayed retirement and options for combining work with receipt of pension.

Automatic adjustment to rising life expectancy. Given the sustained increase in life expectancy, this feature of NDC pensions is essential for long-run viability. But it could equally be a feature of other pension arrangements: for example, if the age at which the pension is first payable rises according to an explicit relation with life expectancy. If NDC pensions have any advantage in this respect, it is that the politics of adjustment might be easier, rather than a design feature possible only with NDCs.

ENHANCE THE ABILITY TO COPE WITH RISK AND UNCERTAINTY

Risk and uncertainty lower the welfare of risk-averse individuals (proof: the amount that people spend on voluntary insurance). Consumption smoothing is thus more efficient if people can be protected from excessive risk and uncertainty. The distinction is important: with risk, the probability of the occurrence of the insured event is known; with uncertainty, it is not. Risks can be covered by actuarial insurance. With uncertainty, in contrast, ignorance of the underlying probability distribution makes it difficult or impossible to assess an actuarial premium; hence uncertainties are generally covered badly, if at all, by actuarial insurance. In the case of pensions, the estimates of life expectancy have a sufficiently small variance that annuities are possible. With inflation, in contrast, the variance of future rates is so high that fully inflation-proofed private pensions are hard to come by and expensive. In short, it is no accident that it is possible to buy life insurance but not inflation insurance.5

What risks and uncertainties can hamper consumption smoothing? All pension schemes face macroeconomic shocks, demographic shocks, and political risks. Private, funded schemes face additional risks:

- **Management risk.** This can arise through incompetence or fraud, which imperfectly informed consumers cannot monitor effectively.
- **Investment risk.** Pension accumulations held in the stock market are vulnerable to stock market fluctuations. At its extreme, if a person is required to retire on the day of his sixty-fifth birthday, there is a lottery element in his pension accumulation.
- **Annuities market risk.** For a given accumulation, the value of an annuity depends on remaining life expectancy and on the rate of return the insurance company can expect over those years. Both variables face both risk and significant uncertainties.

NDC pensions avoid some of the risks that private pensions face, notably management risk and investment risk. They may also reduce annuities market risk, if only because with a single, nationwide annuities pool, the law of large numbers will reduce the variance facing the insurer (that is, the state). This is an unambiguous advantage. However, the advantage is inherent in state-run PAYG schemes generally, rather than NDC schemes specifically.
Less stringent demands on private sector institutional capacity. Private pensions make considerable institutional demands on both the public and the private sector. The latter will be absent in poorer countries. Even where it is present, private pensions may not be the most welfare-enhancing use for scarce private sector skills, which might better be used in building up productive capacity. NDC pensions make no demands on the private sector, though that advantage is inherent in all state pensions. As discussed in the third section, however, NDC pensions make heavier demands on public institutional capacity than state schemes with a less tightly defined relation between contributions and benefits.

Capacity to cope with uncertainty, not just risk. With social insurance, the contract is not fully specified. Precisely for that reason, social insurance can adjust to changing conditions and unforeseen contingencies. Atkinson (1995, 210) points out that “the set of contingencies over which people formed probabilities years ago may have excluded the breakdown of the extended family, or the development of modern medicine, simply because they were inconceivable.” Thus social insurance, in sharp contrast with actuarial insurance, can address not only risk but also uncertainty.

Thus NDC pensions have the potential to ameliorate uncertainty in ways that private schemes do not. The ability to pay fully indexed pensions once a person has retired is one example; the capacity to protect the pension rights of people with caring responsibilities (which is not an insurable risk) is another. This is a significant advantage—again, however, one that resides in social insurance generally, rather than the NDC design specifically.

Assist sustainability
If an NDC scheme is genuinely actuarial, then future expenditure is by definition equal to revenues, so that the scheme—again by definition—is sustainable. This feature, however, is not exclusive to NDCs. Consider a balanced PAYG scheme, where:

\[ sWL = PN \]

where

\[ s = \] the PAYG social security contribution rate,  
\[ W = \] the average real wage,  
\[ L = \] the number of workers,  
\[ P = \] the average real pension, and  
\[ N = \] the number of pensioners.

If the social security act specifies a pension formula in which

\[ P = \frac{sWL}{N} \]

again, expenditure = revenue by definition.

Thus sustainability is not specific to the NDC design. It may be, however, that the politics are easier with NDCs.

Enhance transparency
The argument is that NDC pensions have explicit rules and therefore that the system is transparent in two ways: individuals know the basis on which their pension will be calculated; and any attempts by government to alter the scheme are visible. These features are important, but not exclusive to NDCs. The U.K. system prior to 1975 was highly transpar-
ent, with a flat rate contribution for all workers giving entitlement to a flat rate benefit. Another example of transparency is a PAYG scheme with defined benefits, but with retirement age explicitly related to life expectancy, significantly reducing the need for other parametric change. A final salary scheme is also transparent to the recipient, and government attempts to change the benefit are very visible.

**Reduce Incentives for Fraud**

In an NDC scheme, like all PAYG schemes, the only pot of money is the current year’s contributions: that is, the flow of contributions, not the stock. Thus there are few assets for the state or private actors to pillage. Separately, if the state wants to increase the taxation of pensions, it can do so only on benefits in payment, not on the fund, since there is no fund. Both features, once more, are inherent in PAYG generally rather than in NDC design specifically.

NDC schemes thus have advantages, but almost all of them are features of state pensions generally, rather than exclusive to the specific design of NDCs. Separately, any advantage of principle may impose a heavy requirement in terms of government capacity, a topic to which the third section returns.

**Equivocal Aspects**

Some features of NDCs can be regarded either as advantages or disadvantages, depending on views about theory, empirical facts, or values.

**Non-distortionary**

In discussing the impact of pensions on labor market decisions, it is helpful to distinguish two statements: badly designed pensions cause labor market distortions; and fully actuarial pensions minimize such distortions. This chapter argues that the first statement is true, but the second does not follow.

Badly designed pensions undoubtedly cause labor market distortions in terms of both retirement decisions and responses earlier in life. 6 If the concern is the retirement decision, pensions should be related at the margin to individual contributions. The argument is important. It is open to policy makers to have a pension formula that is redistributive in the sense that worker A, with twice the earnings of worker B over his working life, gets a pension which is higher than B’s, but less than twice as high. However, if either A or B retires early, his pension would be actuarially reduced relative to the pension he would have received at age 65. In contrast, earlier labor market decisions depend not only on the marginal relationship between contributions and benefits, but also on the effect of an increase in earnings on the total pension package. In this case, it is necessary to consider a fuller actuarial relationship between contributions and benefits.

How do these arguments apply to fully actuarial pensions like NDCs? Badly designed state pensions cause major distortions. However, state schemes, whether NDC or DB, avoid one important distortion—the labor immobility problem caused by private DB schemes. In addition, DB schemes with long averaging periods are less distortionary than with a short period and, as discussed earlier, can be very similar to a DC scheme. More fundamentally, the next section argues that fully actuarial benefits are not optimal in a second-best world.

A second reason why a fully actuarial design might not be optimal is that minimizing distortions is only part of the story. The argument implicitly assumes that all that matters is labor supply. But it can be argued that what really matters is economic welfare. It may be, for example, that a defined benefit scheme reduces labor supply at the margin, but if
the loss of utility resulting from lower output is more than offset by the utility gain resulting from greater certainty about consumption smoothing, then defined benefit arrangements may be welfare-improving, notwithstanding reduced labor supply. At a minimum, the welfare gains from greater certainty should be set against any costs of reduced labor supply.

Thus the argument that NDC pensions minimize distortions is far from definitive. If the argument is true, then it is also true of other schemes in which contributions bear an actuarial relationship to contributions, for instance a scheme with flat rate contributions and flat rate benefits, such as in the United Kingdom between 1948 and 1975. The desirability, or otherwise, of actuarial benefits is taken up in the next section.

**Equitable**

The argument that actuarial benefits are equitable rests on the belief that redistribution should apply only to poverty relief and to credits in specific instances such as caring for small children. A contrary view is that the state pension should include redistributive assistance for consumption smoothing as well as for poverty relief. It can also be argued that, though NDC pensions help to cope with risk and uncertainty, they continue to face the individual with significant risks associated with the variability of earnings; other approaches, for example, DB, share risks more broadly, as discussed in the first section.

Thus NDC pensions do not have a unique claim to equity. They are inequitable if policy makers or the electorate believe that social insurance has a redistributive role broader than poverty relief and/or if policy makers want risks to be shared more broadly than is possible with actuarially based benefits.

**Ties the Hands of Government**

The proposition is that NDC pensions, being actuarially based, constrain the government’s freedom of action. Two sets of questions arise.

Does the NDC design really tie the government’s hands? In theory, the contract is fixed; but government could change the contract. Second, is tying the government’s hands welfare-improving? At the core of this question lie two further sets of questions. The first is an empirical issue about the competence and motivation of government, about which people may take different views, and about which conclusions might differ for different countries. Some writers are sceptical about government, arguing that politicians award concessions to special interests in exchange for short-run political support, leaving the costs of those concessions to future taxpayers, at a time when the politicians who have granted them have long since retired. The contradictory argument is that a disadvantage of NDCs is that they reduce policy flexibility by adopting a fully specified contract, and thus forgo options for enhancing consumption smoothing by reducing the uncertainty faced by the individual. A second question concerns the trade-off between the certainty of a supposedly rigid scheme versus the greater options for risk-sharing that can occur with a more flexible scheme.

If tying the hands of government is thought an advantage, is this possible only with NDC pensions? In principle the answer is no: NDC schemes are based on a social security law just like other PAYG schemes. It is true, however, that it might be harder politically to change NDC pensions.

**Disadvantages**

Alongside their advantages and equivocal aspects, NDCs have two significant sets of disadvantages: they are not efficient, and they are suboptimal in welfare terms.
INEFFICIENT

A central objective of pensions is to allow each person to make efficient choices about the time path of his or her consumption. Such a system of consumption smoothing should minimize distortions.

On the face of it, this suggests that a strictly actuarial system would be efficient. Indeed, Góra and Palmer (2003, 15–16) write:

In the NDC and FDC [funded defined contribution] framework there is no redistributive ambition, other than redistribution over the individual’s own lifecycle from working years to years of retirement. Instead, the government’s redistributive policy . . . is financed through explicit taxes from general revenues. . . . In this way, insurance and its source of financing and social policy and its means of financing are kept separate, enhancing transparency.

The approach gives rise to a number of queries. First, why is it efficient to have both first- and second-tier pensions organized on a DC basis? More fundamentally, though a strictly actuarial scheme may be efficient in a first-best world, policy design needs to cope with serious market imperfections.

People can be myopic and/or imperfectly informed, giving a justification for compulsion. The problem is nontrivial, and means that the simple assumption of rational utility maximization may not hold. New (1999) makes the useful distinction between an information problem and an information-processing problem. An information problem can be resolved by providing the necessary information, such as the capacity of different computers, after which the individual can make his or her own choices. With an information-processing problem, in contrast, the problem is too complex for agents to make rational choices, even if the necessary information is provided. The problem can arise where the time horizon is long, as with pensions; or where the good or service involves complex probabilities, including, for example, life expectancy (the failure in this case is an inability to process probabilities); or where the information is inherently complex, as with complicated pension products.

A second problem is missing markets. The market for indexed contracts, for example, is thin, to say the least.

Progressive taxation is a third deviation from first-best. Diamond argues that in the comparison between defined contribution and defined benefit schemes, “there is no simple dominance of one over the other in the presence of other labor market distortions” (2002, 57). Assuming that the rate of interest exceeds the rate of wage growth over the longer term, he continues:

Indeed, with a progressive annual income tax and age-earnings profiles that are generally increasing in real terms, the marginal income tax rate is rising with age, on average. Thus, a well-designed DB system may well have better labor market outcomes since the overall tax burden, income tax plus net tax from social security, will vary less over the life-cycle. That is, income taxes are lower on the young and net social security taxes are higher. Therefore, without a detailed calculation, one cannot reach an efficiency conclusion. In any case the difference is likely to be much smaller than the difference between DB systems with long and short averaging periods.

Formulating the issue as an optimal taxation problem would make it clear that in a second-best world, a scheme that is strictly actuarial is not, in general, efficient.
SUBOPTIMAL IN WELFARE TERMS

Consumption smoothing is one objective of pensions but, as discussed at the start of the chapter, there are others, including reducing the risk people face (implicit in both the consumption smoothing and insurance objectives), poverty relief, and distributional objectives (which may include subsidizing consumption smoothing by people only slightly above the poverty line). A strict adherence to actuarial benefits may provide consumption smoothing, but sets aside the others.

Proponents of NDC pensions then argue that the NDC pension provides consumption smoothing, and other instruments provide poverty relief and distributional goals. But—going back to a point I learned so many years ago as a graduate student—if there are three targets, three instruments are needed to achieve them. The optimal solution, however, is normally not a single one: one relationship between each instrument and a particular target. The NDC arguments are tidy in this respect and, on that account, rather appealing. But that does not make them right—as an optimal tax formulation would make clear.

Prerequisites for Implementation

The previous section asked whether NDC pensions are desirable. This section considers very briefly the parallel question: are they feasible?

An initial question for policy makers concerns the level and distribution of income. If the country is poor, the poverty line, which determines the minimum pension, is relatively close to average earnings. Hence there is little gain from an earnings-related pension in general, and NDC pensions in particular. Thus a prerequisite for NDC pensions is sufficient disparity in the earnings distribution to make consumption smoothing relevant.

A second central issue is that contributory pensions in general, and NDC pensions in particular, require considerable government capacity. The government needs to have sufficient economic capacity to maintain macro stability, sufficient political capacity to make long-term pension promises credible, and sufficient basic institutional capacity to collect contributions, to account for them in each year, and to cumulate records across years. The last of these conditions is particularly important for NDC arrangements, where every cent of every contribution counts toward a person’s final pension. For NDC pensions, government also needs advanced institutional capacity for monitoring changes in life expectancy and for maintaining the long-run balance of the scheme, for example, the capacity to run a reserve fund effectively. Merely to state these requirements makes it clear that NDC arrangements impose particularly heavy demands on public sector capacity. Where this capacity is absent, NDC pensions should be regarded as future option rather than current policy.

Conclusion

Góra and Palmer (2003) talk about the need to “create new concepts” (p. 2) and about the “design of a new vehicle for efficient accumulation over the life cycle” (p. 27). Palmer’s work has mapped out the idea of NDCs—in terms both of policy and implementation—much more fully than previously. This is a considerable advance. NDCs remind us that state PAYG pensions can be as much or as little actuarial as we want: in other words, social insurance is not necessarily redistributive. Thus the approach is important because it reminds us of an important but often forgotten truth, but is not itself new. As I wrote in 1987 (and others had doubtless written before), “[Redistribution] is not inevitable, since a PAYG scheme could be organized to pay actuarial benefits” (Barr 1987, 222, emphasis in original).
**Conclusion 1: NDCs Are Not a Dominant Policy**

Put another way, NDCs are a design for state pensions, not the design. Except in a world that is first-best and where policy makers are indifferent about distributional matters, a strictly actuarial relationship is not an optimum. That is stated as a proposition in theory. It implies that we cannot say that a strictly actuarial relationship is always and necessarily the best way to design pensions; indeed, it will generally not be optimal.

Put another way, the theoretical conclusion leaves it open to people to take different views about pension design. Thus it is entirely sensible, coherent, and defensible to advocate NDC pensions. But since they are not a theoretically dominant policy, there are other sensible, coherent, and defensible policies: for example, a pension design that includes redistribution not just for poverty relief but also for consumption smoothing. Sweden, with its NDC system, offers an important example. But so do other countries, such as Australia (noncontributory, income-tested, first-tier pensions plus mandatory DC second-tier pensions), the Netherlands (tax-funded citizens’ pensions plus mandatory, largely occupational second-tier pensions), and the United States (contributory DB first-tier pensions plus voluntary DC third-tier accumulations). In short, there is room for different views about preferred pension design.

On what basis should different policies be assessed? Much of the issue depends on the answers to the following questions:

- **Question 1.** Is policy flexibility an advantage or a disadvantage? This is the old rules-versus-discretion debate. The answer depends on empirical views about the effectiveness and probity of government, and will therefore vary from person to person and by country.

- **Question 2.** Is a wholly actuarial system (for example, NDC first tier + funded DC second tier) efficient? As discussed earlier, the answer is generally no; but the extent of welfare loss will depend, among other things, on the extent of risk aversion in the population (the welfare gains from greater certainty being higher the greater the degree of risk aversion).

- **Question 3.** Are actuarial benefits equitable or not? This ultimately is a value judgment about whether redistribution is or is not properly limited to poverty relief.

- **Question 4.** Would NDC be more sustainable than a defined benefit scheme? Note that we are comparing current defined benefit schemes as they are, with lots of barnacles, with a perfect, pristine NDC scheme. The answer is probably more political than economic.

- **Question 5.** Is the scheme cost-effective? The answer will depend on objective factors such as the level of income in a country, and on empirical judgments about whether or not the relevant supporting institutions are sufficiently developed.

**Conclusion 2: It Depends on What You Mean by NDC**

NDCs can take many guises. Two polar cases are particularly relevant.

- **Case 1.** The pension system is NDC plus a minimal guarantee. Such a system comes close to being strictly actuarial, and hence offers insurance in respect of the longevity risk and consumption smoothing, but only minimal poverty relief and vertical redistribution. This is a corner solution, and hence can be criticized for being inefficient and also, depending on one’s perspective, inequitable.

- **Case 2.** The pension system has two elements: a tax-funded pension that can either be flat rate or with an earnings-related component, and an NDC element. The latter may include tax-funded credits, for example, to recognize caring activities. This arrange-
ment offers poverty relief, insurance, and consumption smoothing. If the tax-funded element has an earnings-related component, there is a redistributive element in consumption smoothing.

The latter construct contains a richer array of policy options. But in this case the NDC pension is not the first tier, but the second. It amounts to a pension system with a tax-funded first tier and an NDC second tier. NDC is no longer the pension, but an element in a wider system.

Finally, as discussed earlier, a state-run DB scheme with accrual over a full working life, an age-related accrual rate, and annuities determined ex post is formally identical to an NDC scheme based on earnings growth per worker.

Conclusion 3: NDC Pensions Do Little to Address the Central Funding Issue

The root of long-term unsustainability is that in virtually all countries pension schemes incorporate a retirement age of 60 or 65, which remains largely fixed as life expectancy rises. Rising life expectancy is a source of joy; the problem is having a fixed age at which the pension first becomes payable.

NDC pensions address the problem in a formal sense by reducing the accrual rate. But unless people retire later, this approach on its own risks pensioner poverty. That is, sustainability is in conflict with sound social policy. In the absence of any constraints, the endogenous variable is not the minimum pensionable age but the size of the pension. In a world of rationality and perfect information, this would face each person with an actuarial budget constraint against which to make his or her optimal choice about when to retire. But if people have a personal discount rate higher than the interest rate used for actuarial adjustment, they will tend to retire as soon as possible, with progressively larger actuarial adjustments as life expectancy increases. In the limit, this pulls everyone down to the minimum pension. One of the conclusions to emerge from Gruber and Wise (1998, 2002) is that many people retire as early as they are allowed. “The collective evidence from all countries combined shows that statutory social-security eligibility ages contribute importantly to early departure from the labor force” (Gruber and Wise 1998, 161). Thus a minimum age at which a person may first receive a pension is an important element in pension design.

Given these arguments, my own view is that a minimum pensionable age that rises over time is an essential ingredient in the policy maker’s armory. A more comprehensive solution has five elements:

• Policy makers should set an initial pensionable age at a point that makes it fiscally feasible to provide a genuinely adequate state pension. In the absence of a normative theory, a pragmatic approach would be to work out the maximum fiscal envelope for pensions, and the minimum genuinely adequate pension. Together, these determine the maximum number of pensioners that can be supported. That figure, combined with the age distribution, determines the initial pensionable age.
• Deviations from that pensionable age should be roughly actuarial.
• Over time, the minimum pensionable age should increase in line with rising life expectancy in a way that is rational and transparent, so that people know a long time in advance when (in broad terms) they will be able to retire.
• Labor market reform should introduce flexibility to allow people to move from full-time work toward full retirement along a phased path of their choosing. The design of pensions will need to support these choices.
• Government should strengthen its efforts to increase public understanding of the simple economics of pensions.
Notes

1. “Notional defined contribution” and “non-financial defined contribution” should be understood to have the same definition.
2. Pay-as-you-go pensions are paid (usually by the state) out of current tax revenues. With funded schemes, pensions are paid from a fund built over a period of years from the contributions of their members.
4. The question of whether pensions should be actuarial at the margin or across a person’s entire contributions record is discussed in subsequent sections.
5. See Barr (2004), chapter 9.

References


