

Notional accounts

Notional defined contribution plans as a pension reform strategy

Notional accounts are designed to mimic a defined contribution plan, where the pension depends on contributions and investment returns. (For this reason, they are sometimes called ‘notional, defined-contribution’ schemes). Pension contributions are tracked in accounts which earn a rate of return. However, in notional accounts, the return that contributions earn is a notional one, set by the government, not the product of investment returns in the markets.

Like traditional social insurance schemes, they are publicly provided. However, the pension formula differs somewhat from the ‘traditional’ earnings-related model, with the benefit based on the accumulation in one’s account at the time of retirement. Pension accounts in this system are called ‘notional’ because there is no pot of pension fund money, just a series of individual claims on the future public budget. They are pay-as-you-go financed—current contributions pay for current benefits—just like most defined-benefit public schemes.

When the individual reaches pension age, accumulated contributions and notional returns—termed notional capital—are converted to an annuity. By adjusting the annuity rate, the government can adjust the pension value to take account of life expectancy.

Recent reforms in Italy, Latvia, Poland and Sweden were based on the notional-accounts model.

(The new systems are described in boxes below.) This note assesses the arguments for notional accounts relative to alternative strategies for pension reform.

Pension reform strategies

The cost of government promises to pay pensions has been both highlighted and exacerbated by the aging of the population. The scale of these current and projected future commitments has prompted a search for effective pension reforms.

The traditional approach to making public pension promises more affordable has been to adjust the pension system’s parameters, such as pension eligibility age, indexation arrangements and the rate at which benefits accrue. However, this strategy has often proved unsatisfactory. Benefit cuts have been insufficient to put the pension system’s finances on a sustainable footing. And governments, with their eyes on the short term, have often reversed previous policy changes.

A second strategy is to shift some provision to mandatory, funded individual pension accounts. This model—set out in the World Bank’s report,

Averting the Old Age Crisis—consists of:

“a publicly managed system with mandatory participation and the limited goal of reducing poverty among the old; a privately managed mandatory savings system; and voluntary savings.”

This briefing is part of the World Bank’s Pension Reform Primer: a comprehensive, up-to-date resource for people designing and implementing pension reforms around the world. For more information, please contact Social Protection, Human Development Network, World Bank, 1818 H Street NW, Washington, D.C. 20433; telephone +1 202 458 5267; fax +1 202 614 0471; e-mail socialprotection@worldbank.org. All Pension Reform Primer material is available on the internet at www.worldbank.org/pensions

Some 20 countries around the world have now adopted this schema. The main obstacle to reforms of this type is the transition cost. In simple terms, one generation has to pay for pensions twice: first, for their parents' pay-as-you-go entitlements and secondly, for their own funded pensions. (See the Pension Reform Primer briefing note on transition.)

The system of notional accounts, its proponents argue, offers a 'third way' between these two proposals. By maintaining pay-as-you-go finance, notional accounts avoid the transition costs incurred by a shift to funding. By mimicking the structure of defined contribution plans, they avoid some of the problems of schemes with a defined benefit formula.

Fairness in pensions

Linking individual pension benefits more closely with individual contributions is a central motivation for reforms based on notional accounts. This enhances the 'actuarial fairness' of pay-as-you-go pension systems. For example, Edward Palmer, an architect of the Swedish reform, argues that "a fundamental feature of the notional defined contribution system is that it is fair". To explore the fairness issue, we compare pension entitlements under notional accounts with a traditional defined-benefit scheme.

Notional capital at retirement in a notional-accounts scheme is the sum of earnings multiplied by the contribution rate. Earnings are revalued by an index, such as the wage bill, which is the notional rate of return on contributions to the scheme. This sum is then multiplied by a set conversion factor, often called the '*g*-value'. Note that the government sets the value of all the variables: the contribution rate, notional rate of return and the *g*-value. In fact, the contribution rate attributed to the notional account may not even be equal to the contribution rate paid by the contributor, as the experience of Latvia and Italy shows.

A defined benefit formula could be similar. Individual earnings, again revalued by an index to take account of changes in the cost or standard of living, are summed over the working life and then

multiplied by an accrual factor. The structure is the same. If the revaluation index is the same as for notional accounts and the accrual rate is equivalent to the *g*-value multiplied by the notional-accounts contribution rate, then the pension values are the same.

There are, however, some differences in practice. The defined-benefit formula in many public pension systems uses the earnings only of a sub-set rather than the full lifetime average. For example, pensions in two-thirds of developing countries and two in five OECD countries are based on some measure of 'final' pay, ranging from the last month's to the last ten years' earnings. A further fifth of countries use a limited number of 'best' years' earnings. Notional accounts, like the benchmark defined benefit scheme, are based on lifetime average earnings.

A second difference stems from changes in the accrual rate with the duration of pension-scheme membership. Fifty countries' public pension plans pay more for early years' contributions (usually the first 10 or 20 years') than for subsequent contributions. Notional accounts, in contrast, give equal weight to all years' contributions.

There are strong arguments for basing pension benefits on lifetime average earnings. First, using a limited number of best or final years disproportionately rewards people with steeply rising pay profiles. These tend to be better-paid careers. Secondly, it opens the system to abuse through people manipulating their reported earnings. Thirdly, it encourages people to retire rather than move to part-time or lower-paid jobs.

However, these gains can just as readily be achieved with a defined-benefit scheme based on lifetime average earnings with a constant accrual rate. Indeed, Mr Palmer argues that notional accounts are 'fair' because two people of the same age receive pension benefits proportional to the amount they pay into the scheme. But this is equally true of many defined-benefit plans.

Fiscal sustainability

Funded pension systems avoid many of the problems of financial sustainability by ensuring that

there are assets to match pension liabilities. In a defined-contribution scheme, assets and liabilities match, by definition, at each point in time. Increased longevity reduces individuals' pension benefits directly, as annuity providers alter the prices they charge. But the cost of any unexpected increase in life expectancy after retirement falls on the annuity companies.

Pension liabilities in most pay-as-you-go systems are forecast to rise as a share of national income. This results both from the aging of the population and from increasing generosity of public plans. Fiscal sustainability is generally a central motivation for pension reform. But notional accounts are neither a necessary nor a sufficient condition for improving a pension system's finances. Sustainability requires real benefit cuts (or, failing that, contribution increases) which are not delivered by a system of notional accounts *per se*.

More subtly, the notional-accounts formulae that have been adopted include some automatic stabilizers to help sustain the system's finances in the face of adverse demographic or economic shocks. First, the '*g*-factor', the annuity rate set by the government, adjusts the pension benefit to reflect increases in longevity. The system is therefore immune to this aspect of worsening demographics (but not to other changes, such as declining fertility). This means that the pension replacement rate falls automatically when mortality improves.

However, there is no reason why these automatic cuts in benefits will be any easier to achieve in a notional-accounts system than discretionary cuts would be in a defined-benefit scheme. Nor are notional accounts necessary for this kind of automatic stabilizer. Italy, for example, will in future adjust the replacement rate in its defined-benefit plan every 10 years to reflect increased longevity.

A second kind of stabilizer comes in the choice of the notional rate of return credited to individuals' notional accounts. A 'fair', pay-as-you-go social-security contract is one giving each generation a return on their contribution equal to the product of employment and productivity (wage) growth. This fair return represents the growth in the econ-

omy's ability to pay for pensions. This was established in 1958 by Paul Samuelson.

In Poland, notional contributions are uprated by growth in the wage bill (*i.e.*, average earnings and employment growth); in Sweden, by earnings growth; and in Italy, by growth in gross domestic product. These indices broadly reflect the change in the economy's ability to pay for pensions.

Again, however, the same result can be achieved by indexing earlier years' earnings to the same variable in a traditional defined-benefit scheme. Furthermore, Salvador Valdés-Prieto, professor of Economics at the Catholic University of Chile, has shown that notional accounts do not deliver financial stability. If the contributions available to finance pensions were able to be divided among the various claimants each year based on their previous contributions, they would be financially stable. However, the pensions in notional accounts are based on the account balance which comes from the notional interest rate which is determined based on parameters of the past, not the present, which in no way guarantees financial solvency.

Retirement and notional accounts

The declining labor-force participation of older women and older men in particular is a concern in many countries. The reasons for this trend are complex, but probably involve both demand effect—high and persistent unemployment, especially in Europe—and supply effect—pension benefits and the value of other savings have increased. (A separate Pension Reform Primer briefing note examines the issue of retirement.)

Many public pension programs have explicit or implicit early-retirement provisions that are a powerful disincentive to work beyond the earliest possible retirement age. In Sweden, for example, the effective marginal tax rate on working beyond 60 is 35-40 per cent. In other countries, it is higher still. Working beyond the minimum age often entails foregoing pension benefits. It can mean paying pension contributions that do not generate any marginal increment to the benefit when eventually it is drawn.

Notional accounts systems in practice: Italy and Sweden

Italy has one of the world's most expensive public pension systems, currently costing more than 13 per cent of GDP. And the OECD expects the cost to reach 20 per cent of GDP by 2030. The process of reform began, belatedly, in 1992, with standard, 'parametric' changes. But in 1995, the Dini government established a new system.

Pension rights are linked to explicitly to contributions, revalued in line with GDP growth. (A moving average is used to reduce volatility.) This accumulation is converted to an annuity with a 'transformation coefficient', depending on the age the pension is drawn and life expectancy. The pension in payment will be indexed (ultimately) to prices.

But these reforms are unlikely to be sufficient to put pension financing on a firm footing. First, the contribution rate is too low to finance current benefits. The rate will need rise in the future to close this revenue gap. In the meantime, pension accounts will be credited with more contributions than are actually paid. Secondly, people with 18 years' contributions will remain in the old system and only new labor-market entrants will derive their entire pension under the new rules. Pension financing problems will dog fiscal policy for many years to come.

Notional accounts were first proposed in **Sweden** in 1994, but the legislation was not finally passed until 1998. The new system will combine a means-tested 'guarantee pension' with notional accounts, called the 'income pension'. Contributions of 16 per cent of earnings between a floor and a ceiling will be credited to the notional accounts, with 'imaginary' contributions for some people not in paid work (for example, because of caring responsibilities). The notional return is average, economy-wide earnings growth. On retirement, aggregate contributions and notional returns are converted to an annuity. Post-retirement indexation will be to wage growth less 1.6 per cent.

Sweden will also introduce a small funded pension at the same time, with contributions of 2½ per cent of pay. The accumulated fund will be annuitized separately from the notional-accounts pension, but again by a public agency rather than a private insurer.

The new scheme will be phased in, although more quickly than in Italy. People born after 1953 will receive their entire pension under the new rules, while people born between 1938 and 1953 derive a sliding proportion from each of the new and old schemes.

In notional-accounts systems, the g -value varies with the choice of retirement age. Early retirement is possible, but only with an actuarially reduced pension. Later retirement earns a pension increment. For example in Poland, working an additional year beyond 65 will increase the pension by nine per cent; retiring a year earlier, at 64, will reduce it by eight per cent. The hope is that this will provide an incentive for people to remain in the labor force.

Many countries have incentives of this kind in their defined-benefit plans. Half of OECD countries, for example, adjust pension values for early and/or late retirement. The scale of the adjust-

ment varies, but the average (6½ per cent a year) is similar to the adjustment implicit in notional-accounts systems. Again, the advantages of notional accounts can be achieved with a defined-benefit scheme.

Under Poland's pre-reform pensions system, around a quarter of the workforce were in occupations that were offered earlier retirement than the normal pension age with full benefits. The notional accounts system has been used to make the cost of such privileges more transparent: early retirement options can be maintained, but workers must pay a higher contribution rate to reflect the additional cost.

Transparency of notional accounts

Another purported advantage of notional accounts is transparency. One aspect of transparency is macroeconomic: that lack of knowledge of how pension contributions generate and pay for benefits has led to excessively generous pensions, especially those targeted on particular groups. Defined-benefit plans, with their benefit target, encourage unsustainable promises, while reconstituting the system with notional accounts (where contributions are defined) eliminates this tendency. But it could equally well be argued that the problem is the failure of governments to provide credible measures of future pension liabilities in public-sector accounts. Whether pay-as-you-go pensions are defined benefit or determined by a notional-accounts formula makes no difference.

The microeconomic aspect of transparency is that notional accounts provide a closer link between contributions and benefits. Workers, it is postulated, treat defined-benefit pension payments as a political promise and contributions as a tax, which reduces employment (if firms cannot pass higher costs on as higher prices) and workers' effort. If notional accounts encourage workers to treat contributions as savings (generating a future income stream) rather than a tax, then incentives might be improved. It might also encourage workers to move out of the informal or 'shadow' economy.

However, this effect is likely to be of secondary importance. Joining the formal sector involves paying taxes and contributions for other benefits and public spending which do not generate a return to the individual. Workers are unlikely to treat mandatory contributions as they would voluntary saving, particularly when the return they earn is below that on investments. (See the Pension Reform Primer briefing note on coverage for a more detailed discussion.)

Again, defined-benefit plans can be restructured to eliminate pension privileges. By relating pensions to average lifetime earnings rather than some subset of years, a defined-benefit plan can also provide a reward for each year of contributions. After all, the financial flows in a notional defined-

contribution plan can be matched exactly by a defined-benefit plan.

Redistribution

A related issue is reformers' emphasis (for example, in Poland) on separation of the redistributive component of the pension system from the 'actuarially neutral' part (the notional accounts).

However, notional accounts, like any pension system, systematically redistribute *ex ante* in a number of ways, for example:

- from men to women (because annuity factors are the same for both sexes and women live longer);
- through survivors' benefits (because annuity factors do not take account of the number and age of dependants); and
- through credits for periods unemployed or as a student.

This is in addition to *ex post* redistribution, to people who (actually, rather than are expected to) live a long time. Full actuarial neutrality would require annuity rates to be differentiated by factors affecting longevity and the length of payments—sex, income, and number and age of dependants—and the removal of credits for periods out of the labor market.

However, accepting that social security is intrinsically redistributive and designing the system to achieve distributional goals is a simpler approach. For example, a social-security system with a flat-rate universal benefit financed by a proportional payroll tax (with no ceilings on contributions) would decouple contributions and benefits, but achieve distributional goals at low cost.

Notional accounts and funded plans

Contributions to notional accounts 'earn' a notional interest rate, usually set to equal earnings or GDP growth. The rate of return on savings is unlikely to coincide with the notional rate of return. Assume, for illustration, a 15 per cent pension contribution rate, two per cent earnings growth and retirement at 60. A notional-accounts system would deliver a pension worth around 30 per cent of pre-retirement earnings. If the market interest

rate were one percentage point higher, a funded pension would generate a pension replacement rate of around 40 per cent. With a gap of two points between the notional and the market returns, the replacement rate from the funded plan would be around 50 per cent.

Empirical evidence shows that market returns have outpaced the growth in wages. Furthermore, there are theoretical economic reasons why this should be the case. We do not propose to repeat here the arguments for financing pensions through pay-as-you-go or funding. Nevertheless, it is important to note that notional accounts are pay-as-you-go financed. They are not an adequate substitute for a funded system based on true defined-contribution pensions.

This also carries important implications for the long-term operation of notional accounts. These systems make the rate of return on contributions transparent. In a defined-benefit scheme, the rate of return is implicit. If market returns continue to exceed the notional return, it seems reasonable that workers will demand that the return credited to their account is closer to the long-run market return. This would undermine the stability and fiscal sustainability of the system.

Redistribution between generations

In addition to the notional return, two other essential components of the notional defined-contribution formula—the ‘*g*value’ or notional annuity rate, and the procedure for indexing benefits during retirement—are open to political

Notional accounts systems in practice: Latvia and Poland

The first country to introduce an explicit system of notional accounts was **Latvia** in 1995-96. A small mandatory funded pension plan was introduced more recently. Most of the features of the notional-accounts component of the new system are similar to Sweden and Poland.

Latvia is a useful illustration of the interaction between notional-accounts pensions and safety nets of social assistance benefits or minimum pensions (such as the guarantee pension in Sweden).

Latvia’s social assistance pension is a little over a quarter of average earnings, and is paid from age 55 for women and 60 for men. The notional accounts pension after a full lifetime of contributions on average economy-wide earnings would be 46 per cent of pay (for retirement at 60). Someone with a full lifetime at half-average pay (or, similarly, a part-time worker or with a partial contribution record) would be entitled to just 23 per cent of economy-wide average pay, below the social assistance minimum. This, of course, mitigates many of the incentive effects of the new system.

Poland has a larger funded component in its reformed pension system than Sweden or Latvia: seven per cent of earnings will go into individual pension accounts. A further 12 per cent of earnings will be credited to individuals’ notional accounts and another 21 per cent of pay will finance other welfare benefits.

Poland initially proposed to credit notional accounts with a return equal to the rate of growth of the wage bill. But, to reduce the cost of the new system, the final choice of notional return is three-quarters of nominal wage bill growth.

Pension rights accrued under the old defined benefit system will be translated into notional initial capital. Again, there is a guaranteed minimum pension, which will be financed by general tax revenues, and additional credits for periods of unemployment or labor market absence due to caring responsibilities.

Pensions in payment will be price indexed, but there is scope for variation if real wages fall or when fiscal performance is particularly good.

pressure and manipulation. The difficulty, as stressed by Paul Samuelson, is that there is no way for governments to pre-commit to a particular benefit structure in a pay-as-you-go system. Pensions are therefore subject to the ‘policy risk’ that the benefit promise might be broken.

Different ways of calculating the g -value give very different pension entitlements. In Poland, for example, the annuity rate calculation is based on average life expectancy (not the full distribution of possible life expectancies) and assumes a zero rate of return. This cuts the pension by almost 15 per cent for someone retiring at the normal age of 62 compared with calculations using a three per cent return and standard actuarial techniques. The effect is complex, and varies with retirement age: for someone retiring at the maximum age of 70, the difference in the pension value is 6½ per cent. A future government might alter this complex part of the system, possibly with large effects on benefits.

Indexation rules can also be manipulated. In Poland, benefits in payment will normally be indexed to prices. However, if real wages fall, then the real value of pensions will be cut. Furthermore, the legislation permits higher indexation should economic performance allow. The vagueness of this condition is likely to encourage pressure for faster-than-inflation increases.

In Sweden, benefits will be uprated by the deviation from a real wage growth ‘norm’ of 1.6 per cent. So if price inflation is two per cent, and real wages grow at 0.5 per cent, then benefits are uprated by $2 - (1.6 - 0.5) = 0.9$ per cent, *i.e.* rather less than inflation. Again, it seems unlikely, whatever the underlying concept of ‘fairness’, that there would be no pressure for uprating at least in line with prices, rather than real cuts, whenever wage growth falls short of the ‘norm’.

Pension reform strategy

Michael Cichon of the International Labour Office has called notional accounts “old wine in new bottles”. He contends that notional accounts’ “potential financial and distributive effects could also be achieved by a classical, linear defined-benefit formula”. Similarly, notional accounts “could

be very accurately characterized as a ‘thoroughly reformed pay-as-you-go defined benefit scheme’”, according to Karl Gustaf Scherman, former director of the National Social Insurance Board in Sweden. And Olivia Mitchell, a professor at the Wharton School at the University of Pennsylvania has described them as “an unfunded defined benefit plan in defined contribution ‘sheep’s clothing’”.

We agree. Under the following conditions, a defined-benefit plan delivers the same outcomes as notional accounts:

- benefits are based on lifetime average earnings (not a subset of best or final years’ pay);
- earlier years’ earnings are revalued with an index (such as economy-wide earnings growth) that reflects the growth in the economy’s ability to pay for pensions;
- benefits are actuarially adjusted for early and late retirement; and
- replacement rates are adjusted to reflect increases in life expectancy at retirement age.

Thus, as Mr Cichon concludes: “It is the packaging that differs” between notional accounts and defined-benefit pay-as-you-go plans. It has been proposed that notional accounts might make pension reforms politically more palatable, particularly those that involve substantial cuts in future entitlements to restore fiscal sustainability. Yet, it remains to be seen if people will accept cuts in their pension benefits more readily because they are packaged as notional accounts rather than defined-benefit. Indeed, if they did, it would imply that the complexities of notional accounts facilitated the reform through obfuscation, leaving claims of greater transparency rather shallow.

Further reading

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Conclusions and recommendations

- Notional accounts constitute a well designed PAYG defined benefit system, which may be more appropriate when the implicit pension debt is large, making the transition to a funded system difficult.
- They may also be easier to introduce than comparable PAYG defined benefit system reforms because language that clearly relates contributions to benefits may be appealing.
- However, notional accounts do not ensure long run financial sustainability and are subject to the same demographic pressures as other PAYG schemes.
- They also fail to diversify retirement income sources relative to funded schemes.
- Moreover, when implied reduction of benefits is understood, political pressures to prevent these by changing government determined parameters (e.g., notional interest rates, G-values, and minimum pensions) may arise.
- Notional accounts require increased administrative capacity and more information (e.g., life expectancy of the covered population). In countries with weak capacity exists, conventional DB schemes may be easier to administer.

