Tax Expenditures: The Case of Occupational Pensions

ANDREW DILNOT* and PAUL JOHNSON†

INTRODUCTION

There are many areas of the tax system in which substantial concessions are made, or appear to be made, to certain forms of activity. Such concessions, or reliefs, can cost the government money in just the same way as direct public expenditure programmes. The recognition of this fact is important, but we argue in this paper that measuring the revenue forgone as a result of a given tax treatment is not straightforward. In some cases the figures published are easily and frequently misinterpreted, or may be flawed in themselves.

We take as an example for this paper the tax treatment of private pensions in the UK. Private pension funds account for around one-third of all personal wealth in the UK, and hold around 40 per cent of all UK equities. Private pensions are complex and long-lived financial contracts, and their tax treatment is often described as generous. Increasing the level of taxation imposed on them is often suggested as a way of raising substantial amounts of money to finance particular projects or reforms. In Section II we therefore describe the system of taxation for private pensions. Section III looks at the concept of a tax expenditure in more detail and outlines a methodology for arriving at coherent

* Director, Institute for Fiscal Studies.
† Senior Research Officer, IFS.

The work on which this article is based was funded by the National Association of Pension Funds to which the authors are most grateful. They are also grateful to the Economic and Social Research Council for its support under grant W100 28 1002 which made possible much of the basic data and modelling work on which this project has drawn. Thanks for advice and assistance are due to Mike Brown, Michael Devereux, Richard Disney, Ian Farman, David Knox, Tom Ross and Edward Whitehouse. The authors remain responsible for the contents. Anonymised Family Expenditure Survey data used were provided by the Central Statistical Office.

© Institute for Fiscal Studies, 2000
measures of the cost associated with the tax treatment of private pensions, and Section IV applies this methodology to a representative sample of individuals. Section V concludes.

II. THE TAXATION OF PENSIONS IN THE UK

Since it is with tax expenditures on private pensions that we are primarily concerned, a brief outline of the tax system as it affects them is given here. In particular we concentrate on defined benefit occupational pension schemes.1

In simple terms, pensions in the UK are taxed as deferred pay. Contributions to pension funds, whether by employee or employer, are exempt from tax, there is no tax on fund income and pensions in payment are taxed in full. It is worth dwelling briefly on the implications of this type of tax treatment. It confers a post-tax rate of return on saving equal to the pre-tax rate of return. Hence faced with this regime an individual earning 100 can either choose to spend now, paying 25 of tax (assuming he is paying tax at a marginal rate of 25 per cent) and consuming goods worth 75, or save now and consume goods next year. Assume an interest rate of 10 per cent. He can save the full 100 of his earnings, because pension contributions are tax-free. The 100 will earn interest of 10, leaving a fund of 110 at the end of the year, because fund income is tax-free. If the individual retires at the beginning of the next year he can withdraw 110, paying tax at 25 per cent, implying a tax bill of 27.50 and a net withdrawal of 82.50, which is 10 per cent more than 75. The pre-tax rate of return is the 10 per cent interest rate, the post-tax rate of return is the reward for deferring consumption for one year as a percentage of the deferred consumption, which is also 10 per cent (7.50/75.00). The equality of pre- and post-tax rates of return is the central feature of the form of tax treatment frequently referred to as Expenditure Tax treatment, because tax is only due when income is consumed rather than when earned (see Meade Committee (1978), Kay and King (1990) and Fry, Hammond and Kay (1985) for further discussion).

While this brief description of an ideal Expenditure Tax treatment sums up the tax treatment of private pensions quite well, in practice of course the situation is somewhat more complex. The main deviation from the type of neutrality described lies in the possibility of a tax-free lump sum being taken on retirement.

The 1970 Finance Act defines the conditions under which a (defined benefit) pension scheme can be allowed the status of an ‘exempt approved scheme’ and hence benefit from the tax treatment described above. The Board of the Inland Revenue retains extensive discretionary powers to give approval to the large number of schemes which do not actually satisfy the criteria laid down in the

---

1 Defined contribution group money purchase and personal pensions, which are becoming increasingly popular, enjoy similar tax treatment but are not dealt with here. See Disney and Whitehouse (1992) for a discussion.
Act. The main restrictions on approval relate to the maximum level of benefits which limit the annual pension to two-thirds of final salary and the tax-free lump sum to 1.5 times annual salary. In general, firms will only allow three-eightieths of final salary to be taken as a lump sum for every year of contributions, making 1.5 times final salary only after 40 years. The taking of such a lump sum reduces the allowable pension by an amount dependent on the size of the lump sum taken. A man at 65 will typically see his annual pension reduced by one-ninth of the value of the lump sum, a woman at 60 will typically have her pension reduced by one-eleventh of that amount.

Subject to these conditions, the contributions by both employee and employer to a fund are fully deductible from income for tax purposes. Contributions by an employer are not treated as taxable benefits in kind of the employee, and can be set against corporation tax like other labour costs. The income and capital gains of the fund are entirely free of tax, while pensions in payment are taxable in full, though a lump sum on retirement up to 1.5 times final salary is tax-free, as are any similar provisions for payments on death in service.

A further limit on the allowable generosity of private pensions was introduced in the 1989 Budget. It imposed a 60,000 limit on pensionable earnings for new schemes or new entrants to schemes. This was to be indexed by the Retail Price Index and presently stands at 75,000.

III. MEASURING THE TAX COSTS OF PENSION SCHEMES

As we have seen, private pensions in the UK attract a number of important tax reliefs. Partly as a result of this relatively favourable tax treatment, occupational pension funds take an extremely important part of total savings in the UK. It is thus often felt that the cost of taxation support for pension schemes is very high; that is, the fact that pensions are treated relatively favourably for tax purposes means that less tax is raised than would have been raised if this favourable treatment were to be withdrawn. These costs are often referred to as tax expenditures.

The idea of a tax expenditure is based on the fact that support for a particular activity through the tax system imposes demands on public revenue in exactly the same way as does explicit public expenditure. This sounds simple but there may be serious difficulties with the concept. In particular, the assessment of a tax expenditure in some circumstances may require some concept of what the tax system ought to be if there were no tax expenditures. This is a problem when estimating tax expenditures on pension schemes where there is no obvious bench-mark of comparison.

Note that pensions are treated favourably only relatively to many other forms of saving. As we have already seen, they are in fact taxed broadly neutrally (with the exception of the lump sum).
Occupational Pensions

1. Issues in Measuring Tax Expenditures

According to Willis and Hardwick (1978), a tax expenditure is an exemption or relief which is not part of the essential structure of the tax in question but has been introduced into the tax code for some extraneous reason — e.g. in order to ease the burden for a particular class of taxpayers, or to provide an incentive to apply income in a particular way, or perhaps to simplify administration. The term is used to cover, not merely specific exemption but also gaps in the charge as a result of which receipts ... are not subject to tax.

This definition of tax expenditures points to the most obvious problem with their measurement: before they can be measured we must have some clear idea of the ‘essential structure’ of the tax system. In some areas, that may be relatively clear, but in others it is not, and the taxation of savings in general is an area where there is considerable disagreement over the essential structure of the tax system. If we believe that the tax system requires all income to be taxed when it accrues after adjustment for inflation (that is, we favour a Comprehensive Income Tax), we will argue that owner-occupied housing, private pensions, Personal Equity Plans (PEPs) and Tax-Exempt Special Savings Accounts (TESSAs) confer large tax expenditures, that life assurance contracts and direct holding of equity are taxed roughly correctly, and that interest-bearing savings suffer a negative tax expenditure. If we believe that income should be taxed only when it is consumed (that is, we favour an Expenditure Tax), we will argue that owner-occupied housing and pensions confer small tax expenditures, that PEPs and TESSAs are taxed precisely correctly, that life assurance contracts and direct holdings of equity have moderate negative tax expenditures, and that interest-bearing savings suffer a very large negative tax expenditure. These arguments, very appropriately, point us back to the realisation that the crucial debate is over the aims and structure of the whole tax system as it affects saving.

Even if some agreement is reached over the essential structure of the tax system, the task of calculating tax expenditures remains difficult. The most frequently quoted estimates of tax expenditures on pension schemes relate to the amount that would be raised in any one year if, instead of being tax-relieved, all contributions, investment income and payments were to be taxed at the marginal tax rate of the contributor. The Inland Revenue published each year until 1990 a table of the estimated cost of tax reliefs calculated on this basis. The relevant estimated costs for 1989–90 are shown in Table 1.

But there are clear problems with interpreting these measures of the costs of tax reliefs as tax expenditures as defined above. In particular, one cannot reasonably add together the costs of relief on contributions and investment

---

3 That is, more money is raised from the tax than would have been had the essential structure of the tax applied to these assets.
income to produce a total cost. To tax both these and to maintain the taxation of pensions in payment would imply a substantial degree of double taxation. To go back to our earlier example of an individual earning 100 and either spending 75 now or saving, the amount available to spend in one year if spending was deferred would be less than 75. Tax would be charged on the contributions, leaving only 75 to save; tax would be charged on the 7.50 of interest which would be earned, leaving only 5.625. The fund would stand at 80.625 at the end of a year. If this was withdrawn and taxed, the individual would pay around 20.16 and have only 60.47 left to spend, nearly 15 less than he could have spent one year earlier. In everyday terms it would be like saving in a bank out of taxable income, having the interest payments taxed while in the bank and then paying tax on the whole of any money withdrawn. This absurdity emphasises the need for some bench-mark of comparison.

**TABLE 1**

**Tax Expenditures (1989-90) Calculated by the Inland Revenue**

<table>
<thead>
<tr>
<th>Relief</th>
<th>Estimated cost (£ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pension contributions</td>
<td>5,700</td>
</tr>
<tr>
<td>Investment income of pension schemes</td>
<td>4,400</td>
</tr>
<tr>
<td>Lump-sum payments to pensioners</td>
<td>1,000</td>
</tr>
</tbody>
</table>

Source: *Inland Revenue Statistics 1990.*

Other problems are also important. Firstly one of the reasons for the importance of the occupational pension sector is the fact that it has a tax-privileged status. If this tax-privileged status were to be reduced or withdrawn, the amount of saving done through pension schemes might fall. The amount of tax then raised would depend on individuals’ reactions to the change in regime and what happened to any money no longer being saved through the pension scheme.

Secondly, it is important to take account of the fact that pension contributions today will eventually lead to pension payments in the future and tax may be levied on these payments. Not only does this mean that pension rights held today will result in extra taxes in the future, but that the more tax-advantaged pension contributions are today, the more tax revenue is likely to be raised eventually. In measuring the cost of tax reliefs, then, it is important to look at the issue over an extended period — for any individual, this period would have to stretch from his first contribution to the last pension payment at his death. This clearly raises a number of problems relating to the measurement of the present value of incomes spread over a long period, and the rate of discounting to use, among others.
However, to avoid rather spurious snapshot estimates, some attempt has to be made to overcome these problems.

Finally, as has already been stressed, any estimate of the exchequer costs of tax relief requires some assumption about what alternative method of saving would be used if pension schemes were not available or lost some of their tax privileges. In practice, a range of alternative vehicles for saving exist into which pension contributions might be diverted, the most obvious alternatives being PEPs and TESSAs, both of which provide tax-free investment income (subject to some fairly stringent conditions, particularly in the case of TESSAs), but which do not attract tax exemption for contributions. Ordinary building society accounts, by contrast, offer neither tax-exempt contributions nor tax-exempt interest payments. Of course, none of these forms of saving is directly comparable to pension schemes which offer benefits only on retirement and guaranteed annual incomes from retirement until death, whenever that might occur. These other forms of saving are more flexible in that they can be accessed before retirement if desired, and can only provide a guaranteed income from retirement if they are used to buy an annuity.

A number of issues have been raised, then, regarding the tax cost of pension schemes. The first important conclusion is that one must look at the cost over the whole lifetime of a contributor, otherwise the costs are overestimated because no account is taken of extra tax revenue raised when the contributor receives income in retirement. Secondly, it is necessary to use some other form of saving as a bench-mark of comparison for costs. If some tax relief is available elsewhere, the government cannot expect to raise all the tax apparently forgone if all the tax advantages of pension schemes are abolished. A final issue, which we shall not pursue in detail here, relates to the degree to which saving through pensions would be substituted into other forms of saving as opposed to being used for immediate consumption.

2. Possible Methodologies

The above discussion gives some indication of the direction in which one would want to go in measuring tax expenditures on pensions. A workable methodology remains to be found.

The first point to become clear is that the figures produced by the Inland Revenue and reproduced in Table 1 are not useful as estimates of tax expenditures on pension schemes. They take account of none of the problems associated with measuring tax expenditures which have been considered. It is in fact rather hard to think of any useful purpose to which these figures might be applied.

In fact, the Inland Revenue, recognising the problems inherent in this way of measuring tax expenditures, has produced new estimates on a different basis (Inland Revenue, 1991). This takes the existence of unapproved schemes as a
bench-mark for comparison. In unapproved funded schemes, employee contributions are paid out of taxed income and employees are chargeable to tax under Schedule E on any payments made to the scheme by the employer, although the employer’s contributions qualify for a deduction as a business expense. The income and gains of funds are chargeable to tax, usually at the basic rate. All benefits can be taken as a tax-free lump sum, though benefits in the form of an annual pension would be taxable.

The Inland Revenue then uses this as a bench-mark with which the approved schemes can be compared. Thus a total cost of relief for funded approved schemes is then calculated by summing the tax reliefs on contributions by employees and employers and on funds’ investment incomes and then taking off tax liabilities on pensions in payment in the year in question.

This takes account of some problems mentioned above, particularly in subtracting the tax in payment from the total of tax reliefs and thereby taking account of the fact that tax-relieved payments to schemes result in tax payments eventually. However, it still suffers from some problems. By taking tax on pensions in payment at the present time from the reliefs currently being enjoyed by the contributions and investments, current flows are measured but some of the dynamics of the situation are lost. If what we want to know is the present value of the costs over the lifetime of the investment, it would be preferable to estimate what tax payments would be made on the pension eventually earned by the contributions now being made. In an occupational pension system in equilibrium, this would not matter, but at a time when funds are still building up, the cost of tax relief will be overestimated. To see this, consider the introduction of a new pension scheme. Initially there will be tax costs associated with contributions and investment incomes but there will be no offsetting tax receipts from pensions in payment. But the expected flow of tax receipts from the pensions once they are in payment ought to be taken into account.

Perhaps more importantly it is not clear why unapproved schemes should be used as a bench-mark for comparison. They offer a tax treatment essentially the same as that for building society accounts. It is unlikely that much money currently contributed to approved schemes would be invested under such conditions were the present tax reliefs to be withdrawn, since there are many more favourably treated savings vehicles available.

Knox (1990) tries to overcome some of the problems outlined by examining in detail the position of a typical employee under a set of assumptions about earnings, earnings growth, rates of return on investment, life expectancy and so on. In doing this, he compares the tax payments to the government over the period from the first contribution until death that would be made under three different savings methods — a pension fund, a PEP and an ordinary interest-bearing bank or building society account. The cost to the government of the relief for the pension scheme can then be shown as the difference between the tax that would be received from equal saving (equal in the sense of equal cost to
the employee) in the pension scheme and through either of the other savings methods. This allows an estimate of the cost of the tax-privileged status of the pension scheme, for an individual over the period of application, to be made relative to the other forms of saving. This cost can be expressed in pounds at present value or as a percentage of the accumulated pension benefit.

This method yields a number of interesting results, not least confirming the belief that the estimated cost to government depends to a large extent on the benchmark used for comparison and on whether or not extra tax to the government after retirement is included in the calculation. The estimated cost also differs quite significantly according to exactly what assumptions are made about, for example, contribution rates, interest rates and inflation rates.

This basic methodology is clearly useful, but suffers from a number of problems if a realistic assessment of the level of the tax expenditures is required. The most important of these is that the results are sensitive to the actual composition of occupational pension fund membership. The assumptions made include ones regarding the sex, income, contribution rate and marital status of the contributors, as well as ones regarding future inflation rates and so on. To reach a more reliable estimate of the cost, one would want to apply a similar methodology to actual individual data which would give an accurate picture of the characteristics of people contributing to pension schemes and the amount contributed.

IV. THE COSTS OF PENSION TAX RELIEFS: A REPRESENTATIVE MODEL

An attempt is made here to model the costs of the tax advantages enjoyed by occupational pension schemes, using data on actual individuals who are in such schemes. Data from the 1986 Family Expenditure Survey (FES) are used for this purpose and the sample of those appearing to be in an occupational pension scheme is taken. Their earnings are then projected back to the point at which they entered the labour market and forward to the point at which they will leave the labour market. This earnings information is used to predict the amount contributed to pension schemes and the amount received in pensions by each individual.

Use is made of econometric work by Disney and Whitehouse (1991) which allows occupation- and industry-specific earnings profiles for each man in the 1986 FES to be estimated. These individual earnings profiles are then combined with information on real earnings growth in the past — and predicted real earnings growth at 2 per cent per year into the future. This allows us to produce an individual-specific level of real earnings for each year between labour market entry and retirement for each man in the 1986 FES who is in an occupational pension scheme.
We take somebody to be in an occupational pension scheme if either they are recorded in the FES as making superannuation contributions or the level of their National Insurance contributions is such that they appear to be contracted out of SERPS. The combination of these two factors in determining scheme membership allows us to distinguish both those who are in contributory pension schemes (those with recorded superannuation payments) and those who are in non-contributory schemes (those without superannuation payments). On this basis, 86 per cent of our sample of scheme members appear to be in contributory pension schemes and 14 per cent in non-contributory ones; these compare with figures of 87 per cent and 13 per cent recorded by the 1990 NAPF Annual Survey of Occupational Pension Schemes (p. 6, Section 2.3.1). Grossing up the numbers to population totals gives a total number of occupational pension scheme members of around 10.5 million, very close to the actual number of scheme members.

It is on the basis of this information that the rest of the analysis proceeds. It clearly suffers from a number of problems. Firstly, we can only proceed on the basis of those currently contributing to a scheme, ignoring those who have rights to occupational pensions whilst not at present making any payments. Secondly, we cannot tell which of those in our sample will have interrupted working careers through unemployment or ill health at some point in their working life. Women, in particular, are likely to have significant gaps in their working lives, making their lifetime earnings profiles very hard to predict. The only way in which we are able to take account of this is by assuming that some women are likely to stop contributing to pension schemes a number of years before the pension becomes payable. Finally, an assumption has to be made about the level of real earnings growth into the future. For our base run, we assume 2 per cent annual real earnings growth.

Estimating the Costs

On the basis of these data, the total costs of the various tax reliefs associated with private pensions are estimated using a methodology similar to that used by Knox and outlined above. First, however, the reliability of the original data may be tested by estimating the annual cost of tax relief on employer and employee contributions in exactly the same way as was done by the government in Inland Revenue Statistics until 1990. That is, for all of those in a scheme, their marginal tax rate is multiplied by the level of their contribution to estimate a cost for employee contributions. The level of contribution is taken to equal recorded superannuation payments. For employer contributions we take the average contribution rates recorded in the NAPF annual survey, namely 8.1 per cent of earnings to contributory schemes and 13.3 per cent to non-contributory schemes.

---

4 This methodology will miss those few schemes that are both non-contributory and contracted in.
Occupational Pensions

(p. 6, Section 2.3.2). Grossing up the sample to reflect the size and composition of the population as a whole, and bringing the data forward to the present day by multiplying costs based on the 1986 data by the rate of price increase since that time, results in an estimated annual cost of tax relief for employee contributions of around 1.8 billion and for employer contributions of around 4 billion. These compare with published estimates in the 1990 *Inland Revenue Statistics* of 2.2 billion and 3.5 billion respectively. We appear to have a slight underestimate of the cost of employee contributions and a slight overestimate of the cost of employer contributions. However, the total cost is remarkably similar to published estimates.

To make cost estimates using our different methodology, further assumptions need to be made. In particular, assumptions need to be made about level of benefits received, length of time spent in the schemes, age at retirement, life expectancy, future inflation rates and discount rate. The assumptions we use in our base analysis are set out in Table 2. For simplicity, we allow just two retirement ages, either 60 or 65. It is assumed that two-thirds of men retire at 65 and one-third at 60, while two-thirds of women retire at 60 and one-third at 65. These proportions correspond approximately to the spread of retirement ages shown in the NAPF survey (Section 3.4.1, Table 52). Again for simplicity, we assume all receive one-sixtieth of their final salary as a pension per year of pensionable service, this being by far the commonest basis of pension calculation. Hence someone in a scheme for 40 years would receive two-thirds of final salary as a pension.

<table>
<thead>
<tr>
<th>Assumption for Base Analysis</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Male life expectancy</td>
<td>74</td>
</tr>
<tr>
<td>Female life expectancy</td>
<td>80</td>
</tr>
<tr>
<td>Male retirement age</td>
<td>⅔ at 65, ⅓ at 60</td>
</tr>
<tr>
<td>Female retirement age</td>
<td>⅓ at 65, ⅔ at 60</td>
</tr>
<tr>
<td>Real discount rate</td>
<td>1.7%</td>
</tr>
<tr>
<td>Benefit level</td>
<td>Final salary × Years in scheme ÷ 60</td>
</tr>
<tr>
<td>Average time spent by men in scheme</td>
<td>26 years</td>
</tr>
<tr>
<td>Average time spent by women in scheme</td>
<td>20 years</td>
</tr>
<tr>
<td>Average time between leaving scheme and retiring (men)</td>
<td>7½ years</td>
</tr>
<tr>
<td>Average time between leaving scheme and retiring (women)</td>
<td>15 years</td>
</tr>
<tr>
<td>Inflation rate</td>
<td>6%</td>
</tr>
</tbody>
</table>

When considering the availability of tax-free lump sums up to a maximum of 1.5 times final earnings, the pension payable is reduced by a fixed amount.
The available lump sum itself depends upon length of service, since companies are not generally willing to give lump sums up to the maximum permissible for tax purposes if this uses up all or most of the available pension. In the majority of schemes, a lump sum of three-eighths of final salary for each year of scheme membership is payable. Thus only somebody who had been in a scheme for 40 years would be eligible to receive the full tax-free lump sum of one-and-a-half times final earnings. Receipt of a lump sum reduces the available pension by fixed amounts according to age and sex.

Account is taken of the fact that most people will not spend the whole of their working lives in a pension scheme by varying the number of years spent in a scheme such that the average length of time spent in a scheme works out at approximately 26 years for men and 20 years for women. These figures are close to, though slightly above, the average scheme membership lengths recorded by Bone et al. (1992, Table 6.28). Although no account is taken of the possibility of moving between schemes, account is taken of the fact that a number of scheme members, particularly women, are likely to stop contributing to the schemes before retirement. This is reflected in the average length of time between leaving the scheme and retirement, and the effective reduction in benefit that this usually implies.

It is important to note that here we are examining defined benefit pension schemes. This has a number of implications making comparisons with other savings media, which tend, of course, to be of a defined contribution type, a little difficult. As described above, the level of pension is determined as a multiple of final salary. It is assumed that this pension will be paid until death, but falling in value by 1 per cent per year to take account of the fact that, on average, pensions are not fully indexed. The Government Actuary’s Department report for 1983 finds that, on average, pensions in payment were increased by 80 per cent of the level of inflation. With inflation at 6 per cent, this underindexation is roughly equivalent to a 1 per cent fall in the real value of the pension paid each year. The NAPF survey also reveals that around half of occupational pensions are ‘integrated’ with the state scheme. In general this means deducting the level of the basic state pension from the earnings on which the pension is calculated.

Given that the contribution pattern that we are assuming will remain constant as a proportion of earnings, the effect of having the actual level of pension determined ex ante is that the rate of return on investment has to be calculated to allow the funds to fulfil their obligations. That is, the rate of return on investment is not a parameter but is calculated from other parameters. That it should work out at a plausible rate is another test of the model. Given our base assumptions, it works out at 1.7 per cent per annum, which is also used as the discount rate shown in Table 2.

The life expectancies for men and women shown in the table are life expectancies at age 40, the average age of those in our sample, rather than life expectancies at retirement. In the calculations, account is also taken of
inheritance of pensions by widows. They are assumed to inherit half of their husband’s pensions.

We compare the tax effects of occupational pensions with those of Personal Equity Plans (PEPs) and ordinary interest-bearing savings accounts. For purposes of comparison, we assume that on retirement, savings made through one of these media are used to purchase an indexed annuity. Depending on the rate of interest as they do, the annuity rates are also worked out by the model rather than given as parameters.

The income accrued under the three alternative savings media is calculated based on the contributions made over the period in question and the different tax treatments of the contributions and investment income for each form of savings. The sums involved are enormous. Around 780 billion accumulates as the pension fund, 560 billion from the PEP and 340 billion in the ordinary savings account. All the figures are in current prices. They are the sum of the totals contributed by each individual and the interest thereon over the whole period for which each individual is making contributions. As such, they represent the situation in a fund at the end of a period in which people had been contributing and no pensions were being paid. These funds are then used to pay the pensions or annuities of those who have contributed. In this sense, we are treating our sample of people of varying ages as if they were a single cohort. The same process applies when calculating the tax costs. In this case, costs and benefits from each year after the initial year of entry into the labour market are deflated by the discount rate to the year of entry. To make all the figures comparable, these figures for costs and benefits are then brought forward to the present date using the same discount rate. In other words, all the figures presented are in present-value terms.

Table 3 shows the total fund accrued under each form of saving and the total tax payments under each scheme where tax payments under the pension scheme are set at zero. Hence the tax appearing under the PEP could alternatively be considered as the level of tax relief on contributions enjoyed by the pension scheme. The tax payment in respect of the savings account represents the tax on contributions and on investment income. Again the numbers over the full period are rather too big to be meaningful. Dividing the tax numbers by the average number of years between entry into the labour market and death gives an estimate of the present values of the annual amounts of tax paid. The choice of period by which the total should be divided is important. Extending the period to death rather than retirement allows comparisons to be made with income flows after retirement and for all annual costs to be put on a consistent basis. Starting at labour market entry rather than entry into the scheme is clearly necessary, for otherwise the annual cost would increase if people made the same level of contributions but over a shorter period. Overall, since we are looking at our sample over the period from their labour market entry to their death as a single
cohort from the occupational pension point of view, the whole period is the appropriate one for use in annualising costs.

TABLE 3

Some Pre-Retirement Income Flows

<table>
<thead>
<tr>
<th></th>
<th>Pension</th>
<th>PEP</th>
<th>Savings account</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eventual fund</td>
<td>780</td>
<td>560</td>
<td>340</td>
</tr>
<tr>
<td>Total tax</td>
<td>0</td>
<td>140</td>
<td>290</td>
</tr>
<tr>
<td>Annual tax</td>
<td>0</td>
<td>2.4</td>
<td>4.9</td>
</tr>
</tbody>
</table>

The average period of time between labour market entry and death is 59 years. Division by this number gives an annual present value of tax of 2.4 billion from the PEP and 4.9 billion from the savings account. That is, looking just at the income flows before retirement, the tax reliefs applicable to occupational pension schemes are worth 2.4 billion per year relative to a PEP or 4.9 billion relative to an ordinary interest-bearing savings account.

As we have already seen, however, to gain a meaningful estimate of the tax costs of pension schemes requires one to look at the post-retirement situation in addition. Table 4 shows the levels of pensions and annuities paid under the different regimes and the amount of tax payable on each. The situations under which a lump sum, of the size described earlier, is taken and is not taken are both shown.

TABLE 4

Post-Retirement Income Flows

<table>
<thead>
<tr>
<th></th>
<th>Pension</th>
<th>PEP</th>
<th>Savings account</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average lump sum per person</td>
<td>£17,000</td>
<td>£17,000</td>
<td>£17,000</td>
</tr>
<tr>
<td>Average initial payment per person</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lump sum taken</td>
<td>£4,600</td>
<td>£3,700</td>
<td>£1,600</td>
</tr>
<tr>
<td>No lump sum</td>
<td>£6,100</td>
<td>£5,500</td>
<td>£3,400</td>
</tr>
<tr>
<td>Total tax paid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lump sum taken</td>
<td>£75 bn</td>
<td>&lt;£0.5 bn</td>
<td>&lt;£0.5 bn</td>
</tr>
<tr>
<td>No lump sum</td>
<td>£115 bn</td>
<td>&lt;£0.5 bn</td>
<td>&lt;£0.5 bn</td>
</tr>
<tr>
<td>Annual tax</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lump sum taken</td>
<td>£1.3 bn</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>No lump sum</td>
<td>£2.0 bn</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>
Table 4 contains a number of results. It demonstrates how different can be one’s pension entitlements depending on the tax treatment of one’s investments. With a lump sum taken, only a third as much is received annually in retirement by somebody who invested money in a building society as by someone who invested, at the same cost to himself, in a pension scheme. The figures also give some indication of the tax costs associated with the tax-free lump sum available from pension schemes. If the maximum lump sum is taken, then the total tax payments under the pension scheme amount to some 75 billion, as against tax payments of 115 billion if no lump sum is available. This indicates a total cost of around 40 billion. Over the average period from entry into the labour market to death, this indicates an annual cost of tax relief on the lump sum of around 2/3 billion per year compared with a situation in which this tax relief is not available.

Tax receipts after retirement for the three possible savings media are shown. If a lump sum is taken, the receipts from annuities bought with savings from PEPs or building societies are negligible, while the tax paid on money from pension schemes is quite substantial at 75 billion. This rises to 115 billion if no lump sum is taken, compared with under 0.5 billion for the PEP and building society standards of comparison. Perhaps surprisingly, this implies that without the tax-free lump sum, the post-retirement tax received from the pension scheme less that received from the PEP annuity wipes out most of the extra tax received from contributions to a PEP. This occurs despite the fact that the income from the annuity bought with the PEP is taxable. The very small amount of tax actually paid results from the fact that the capital element of the annuity is not taxed, and from the importance of the tax-free personal age allowance.

Returning to the tax system as it is (i.e. including the tax-free lump sum), putting the tax costs in Tables 3 and 4 together allows an estimate to be made of the total cost of tax reliefs for occupational pension schemes relative to the two other savings vehicles. 75 billion is raised from the pension schemes themselves, about 140 billion from the PEP bench-mark, and 290 billion from the savings account. This indicates a cost of around 65 billion relative to a PEP and 215 billion relative to a savings account. Dividing again by 59 to give annual costs results in costs of about 1.1 billion and 3.7 billion per annum respectively.

These annual numbers mean something rather different from the annual costs presented in Inland Revenue Statistics and elsewhere. For one thing, they are present values of a flow of funds over a prolonged period rather than single-year snapshot estimates. Secondly, they take account of the full build-up of pension funds and so look at the effects on future tax revenues of all current contributions rather than current contributions and current revenues. In this sense the numbers quoted do not give an answer to questions regarding this year’s current cost or this year’s revenue forgone. What they do give is an estimate of the present value of costs and benefits which have already accumulated and which are still to accumulate.
The costs calculated are much lower than those presented in Inland Revenue Statistics which shows costs of 7.7 billion in 1989–90 and 8.4 billion in 1990–91. Part of the reason for these different results comes from the difference in the questions being asked. Another reason for the difference may lie in the low nominal rates of return we have assumed (6 per cent inflation plus 1.7 per cent real return). In those years, both inflation and real interest rates were higher; nominal interest rates remain higher than those assumed. As explained, the reason for our assumed real rate of 1.7 per cent was to ensure that the funds’ assets equalled their outgoings. If, instead, an interest rate four percentage points higher had been assumed, the annual cost relative to a building society account would have risen by 1 billion. Secondly, because the Inland Revenue figures subtract current tax revenues from benefits in payment from pre-retirement tax expenditures, they will show lower post-retirement tax receipts than a methodology which calculates tax on future (higher) benefits.

The results given, if they are to be taken as indicative of the cost of tax reliefs, must assume, of course, that in the absence of occupational pension tax reliefs, the same amount of saving would be done. The tax effects of this saving disappearing altogether and the money being spent instead of saved can easily be seen, however, for this would be equivalent to the money raised pre-retirement from the PEP, i.e. the tax on contributions.

V. CONCLUSION

The actual costs of the current tax treatments of private pensions and other assets are often measured in terms of tax expenditures. We have examined this concept and shown that it is only meaningful within the context of a bench-mark against which expenditures can be measured. Then the size of the tax expenditure depends on the bench-mark in use. Furthermore any estimate of the cost of such tax expenditures must take account of transactions over the whole period from the first contribution to the last payment.

Developing a microdata-based model, an actual annual present-value cost of tax relief on pensions of just over 1 billion relative to a PEP and one of under 4 billion relative to an ordinary savings account were estimated. These are rather lower than figures frequently mentioned. This is partly because the question we look at is slightly different, in that our figures refer to the present value of future costs and benefits calculated on the basis of current contributions, while published statistics tend to offer only a snapshot. The figure relative to the PEP bench-mark is probably the more accurate costing, as savings now made through pensions would be likely to move to the next best asset if the tax reliefs on pensions were to be removed. The same cost would apply if, instead of saving in PEPs, individuals reacted to a change in the tax regime for occupational pensions by not saving that money at all.
REFERENCES


National Association of Pension Funds (1990), *Annual Survey of Occupational Pension Funds*, London: NAPF.