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Measuring Value Added in the Pensions Industry

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Measuring Value Added in the Pensions Industry

by David Blake* and John Board**

The providers of personal pension plans,[1] such as life offices, extract charges both from the contributions they receive from policyholders and from the value of the fund accumulated from investing these contributions. These charges pay for plan administration, profit and key services (such as fund management). There is an ongoing debate as to whether personal pension plans deliver investment returns high enough to justify these charges. A related matter is concerned with how to report the expected future payoff from a plan so as to allow consumers to choose between competing plans.

The aims of this paper are to: survey and analyse the charges, realized investment performance, and expected investment performance of personal pension plans in the U.K.; to use modern finance theory and evidence to assess whether it is possible to identify a relationship between these three factors; and, if such a relationship exists, to suggest a method of reporting it that consumers can easily understand.

We find that, on the basis of existing evidence, there is no clear relationship between the three components. In particular, we find that there is no support, either in theory or on the basis of existing evidence, for the argument that high charges can be justified by the promise of the superior investment performance that such high charges might be able to purchase. This is because the evidence indicates that strong investment performance, even if it existed for a period in the past, is very unlikely to be sustained over the long investment horizon needed by pension plans to build up sufficient assets for retirement. As a result, it would be much better for policyholders if providers competed on the basis of charges rather than on past investment performance.

The current complex and often disguised charging structures used by providers is a source of consumer confusion. In addition, the personal pensions industry in the U.K. suffers from very high lapse rates by policyholders. We propose a method of reporting charges that reflects the effect of these lapse rates. We argue that a key contribution to improving value added in the pensions industry is greater use of performance-related charges by both providers and those delivering critical services to providers (such as fund managers). Any suitable charging method must improve the incentive for providers to secure the long-term commitment of their policyholders and penalize underperformance as well as reward outperformance. But even if such incentive structures are not developed independently

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[1] This is the name given to individual defined contribution pension plans introduced in the U.K. in 1988.

within the industry, there is now a significant pressure from the U.K. government to improve value added in the pensions industry in the form of low-cost *stakeholder pensions* which are to be introduced in 2001.

The structure of the paper is as follows: charges, realized investment performance and expected investment performance are discussed in the next three sections, and conclusions are drawn in section 4.

1. Charges

In spite of attempts by the regulatory authority[2] to improve their transparency, the suspicion remains that the structure and scale of pension plan charges is not well understood by consumers.[3] This section outlines some of the key charge categories and explains their impact on the final value of the pension fund.

Types of charges

Pension plan charges can be levied on a number of bases, which can be broadly categorized as:

- Charges imposed on contributions:
  —Entry charges, either related to, or independent of, the size of contributions;
  —Regular (periodic) charges, either related to, or independent of, the size of contributions;
- Charges imposed on the fund value:
  —Regular charges based on interim value;
  —Exit charges based on redemption (i.e. terminal, transfer or paid up) value.[4]

If charges are extracted prior to the delivery of the service to which they relate, they are said to be *front-loaded*, while if they are extracted afterwards, they are said to be *back-loaded*. Front-loaded charges do not tend to provide the best incentive to deliver good service.

Appendix A provides a detailed analysis of the impact of all these charges. It shows that it is very difficult to determine the total charge that will be levied on a particular fund, principally because of the complex interactions between the components of the total charge, and because the use of performance-related charges requires an estimate of future perform-

[2] The Financial Services Authority (FSA). Prior to 2000, retail financial services were regulated by a combination of the Securities and Investments Board (SIB) and the Personal Investment Authority (PIA).

[3] See, for example, Office of Fair Trading, 1997, 1999a.

[4] The terminal value referred to here is the value of the accumulated fund on the retirement date of the policyholder. On that date, the accumulated fund is usually used to buy a life annuity from an insurance company in return for a single fixed charge. Issues relating to the size of the annuity, the determination of the annuity rate and the charges levied for this service are outside the scope of this paper. Estimates by Finkelstein and Poterba (1999) indicate that charges of between 10 and 14 per cent of the accumulated fund for level annuities and between 14 and 17 per cent for indexed annuities are extracted by annuity providers. Blake (1999) analyses the issues involved in annuities markets in more detail.

ance to be made before charges can be projected.[5] The first of these points is discussed in the remainder of this section, and the second is considered in detail in section 3 below.

Reduction in yield

The complexity of the charging structures illustrated in appendix A.1 indicates the need for a summary measure of the impact of charges. The conventional approach is to calculate the *reduction in yield* (*RiY*) resulting from the charges. This, broadly, measures the difference between an *assumed yield* (which is set by the regulator[6]) and the *effective yield* (which is defined as the yield at which the compounded gross contributions into the plan equal the net value of the fund). It should be stressed that, to ensure comparability between funds, the calculation is based on a standard *assumed* or *projected* growth rate (i.e. for the purpose of the *RiY* calculation, providers are required by the regulator to assume a growth rate which is constant both over time and across funds).

The higher the charges, the lower the net contributions invested, and therefore the lower the fund's maturity value and the larger the reduction in yield. While the *RiY* is a mathematically well-defined measure of the fund charge, few retail customers appear to understand it. In the next sub-section, we propose a simple alternative to this measure that retains the mathematical rigour of the *RiY*, but which offers a more straightforward interpretation.

Two effects of the use of the *RiY* can be noted. First, because the *RiY* assumes a particular growth rate for the fund, it will generally reflect neither the yield that different funds expect to achieve on the basis of their investment strategy nor the yield they will actually realize. For example, even if some funds were able to levy higher charges on the grounds of superior investment performance, the *RiY* calculation would reflect the fund's higher charges but not its higher expected investment performance. Second, as discussed below, when performance-related charging is used, the link between realized investment performance and charges means that the simple assumption of a single, common growth rate is likely to produce misleading cost estimates. This suggests that the *RiY* approach may become less useful if providers switch to charging structures based more heavily on performance. Performance-related charging structures are discussed in more detail in appendix B.

Table 1 illustrates the charges for regular premium schemes in October 1998. It shows that, for a five-year plan, the best fund had total charges amounting to 3.1 per cent of the terminal fund value, while the worst fund charged 19.2 per cent. For 25-year plans, the difference between highest and lowest charges amounted to 18.0 per cent of terminal fund value. The table also reports the charges for single premium schemes[7] which, despite their

[5] A further difficulty is caused by the differing treatment of commission. Most personal pension plans are arranged either through a firm's own sales force or appointed representatives, or through an independent financial adviser (IFA). In most cases, a pension plan's charges will include an element of commission payable by the provider to the arranger of the plan. However, some plans are "commission free", which means that the arranger's fee must be paid directly by the customer. Clearly, any complete assessment of a plan's costs should include both the provider's charges and the commission payable.

[6] Before 1999, the assumed yield was set by the PIA/FSA at 9 per cent p.a.; however, as a result of lower inflation, the assumed yield was reduced to 7 per cent p.a. in 1999. The PIA/FSA also revised its other assumptions as follows: 6 per cent p.a. investment returns after retirement, 2.5 pre cent p.a. retail price inflation and 4 per cent p.a. average earnings growth.

[7] These schemes are often used by the self-employed with irregular income patterns who only become aware of their full year's income towards the end of the financial year and then buy a single premium policy on the basis of that income before the new financial year to avoid the loss of tax relief.

Table 1:
Percentage of pension fund value represented by charges and reductions in yield in October 1998

	Regular premium scheme (£200/month)					Single premium scheme (£10,000)				
	5 years	**10 years**	**15 years**	**20 years**	**25 years**	**5 years**	**10 years**	**15 years**	**20 years**	**25 years**
Costs as percentage of fund value										
Best overall	3.1	4.1	7.2	8.5	9.8	3.8	7.1	9.2	10.6	10.4
Best commission-loaded	4.0	4.1	7.4	8.9	10.6	3.8	7.1	9.2	10.6	10.4
Industry average	11.6	13.0	14.8	17.7	19.0	9.6	13.3	16.3	19.1	21.9
Worst fund	19.2	22.0	24.6	28.2	27.8	17.4	20.5	27.0	32.9	38.2
Reduction in yield										
Best overall	1.26	0.79	0.90	0.76	0.68	0.84	0.80	0.70	0.61	0.48
Best commission-loaded	1.63	0.79	0.92	0.80	0.73	0.84	0.80	0.70	0.61	0.48
Industry average	4.91	2.65	1.93	1.68	1.39	2.18	1.54	1.29	1.15	1.07
Worst fund	8.47	4.76	3.43	2.88	2.16	4.09	2.47	2.26	2.15	2.08

Source: *Money Management* (October 1998) and authors' calculations

simplicity, can also involve high charges. However, Table 2 shows that *RiY*s have fallen over time, especially for shorter term plans.[8]

Reduction in contributions

The principal difficulty with the *RiY* approach is that it can be difficult to explain to a non-specialist. This section outlines a simple alternative to the *RiY*, the *reduction in contributions* (*RiC*).[9] This measure, which is presented in detail in appendix A.2, expresses the loss in value arising from a fund's charges as the difference between the *gross contribution* and the *effective contribution* applied to the fund, where effective contributions are defined as the contributions that would have to be paid into a hypothetical zero-load plan so as to generate the same terminal value as the scheme in question. The *RiC* has been described as the measure of reporting charges "most likely to be understood and most useful for the purposes of making comparisons" (Securities and Investment Board, 1988, p. 11).

Table 3 shows illustrative calculations of the *RiY* and *RiC* for a scheme with regular contributions and a typical charging structure. The first panel of the table shows that, as a result of a combination of the front-loading of charges and the effects of compounding, the effective yield on the fund rises with term to maturity and, as a consequence, the *RiY* falls with term from 5.6 per cent for a five-year policy to 1.7 per cent for a 25-year policy. However, although the effective yield rises with term, this is not sufficient to compensate fully for the effect of compounding which results in the *RiC* rising with term to maturity.[10] The *RiC* is 13.1 per cent for a five-year policy and 22.9 per cent for a 25-year policy, exactly equal to the tax break on pension schemes available to a basic rate tax payer at the time.

Table 2:
Reductions in yield, 1994–1999

	1994	**1995**	**1998**	**1999**
10 years	5.0	4.6	3.6	2.5
25 years	1.6	1.5	1.3	1.2

Source: Chapman, 2000.

[8] Note that the figures in Table 1 relate to October 1998, whereas the figures for 1998 in Table 2 are the average for the year.

[9] The reduction in contributions is not a new measure. It is also known as a *percentage rate of premium* and it was the measure of reporting charges originally recommended by the SIB for the new disclosure regime for life assurance and unit trusts that came into operation in January 1990 (see Securities and Investment Board, 1988). However, following industry representations, the SIB adopted the reduction in yield measure of reporting charges on the grounds that this "is a more appropriate approach for a product intended to be a long-term investment vehicle" and that "the short-term impact of charges is broadly reflected in the discontinuance values which have to be disclosed" (Securities and Investment Board, 1989, p. 15).

[10] As a rule of thumb, the following relationship holds between *RiC* and *RiY*: $RiC \approx (t/2)RiY$, where t is the term of the policy in years. *RiC* will rise with term, unless *RiY* falls sufficiently rapidly. The new stakeholder pension plans that will be introduced in 2001 have a maximum *RiY* of 1 per cent, irrespective of term. This means that the *RiC* for such plans will rise with term and this is a direct consequence of compounding.

Table 3:
Reduction in yield and reduction in contributions for a typical pension plan in 1998
(percentages)

	5 years	10 years	15 years	20 years	25 years
Ignoring policy lapses					
Effective yield (g')	3.4	5.8	6.7	7.1	7.3
Reduction in yield (*RiY*)	5.6	3.2	2.3	1.9	1.7
Reduction in contributions (*RiC*)	13.1	15.2	17.6	20.2	22.9
Adjusting for policy lapses					
Effective yield (g')	−9.2	−3.7	−0.9	1.0	2.3
Reduction in yield (*LARiY*)	18.2	12.7	9.9	8.0	6.7
Reduction in contributions (*LARiC*)	37.1	47.8	54.4	58.8	62.0

The table illustrates a regular premium scheme with contributions of £200 per month, and makes the following assumptions:

	Symbol	Value
Charging structure:		
Allocation	a	95%
Bid-offer spread	s	5%
Fund management fee	f	0.75%
PUP fee	x	0
Policy fee (continues after lapse)	M	£3 p.m.
Uprating factor for policy fee	i	4.5% p.a.
Other assumptions:		
Yield	g	9.0% p.a.
Lapse rate in year 1	q_1	16.20%
Lapse rate in year 2	q_2	13.25%
Lapse rate in year 3	q_3	11.55%
Lapse rate in year 4	q_4	11.04%
Lapse rate from year 5	q_{5+}	6.5% p.a.

It is important to understand that the *RiC* and *RiY* are summary methods of reporting and comparing the effect of charges.[11,12] They have no implications for the levels of charges actually levied by firms or for the structure of those charges. For example, the use of the *RiC* does not necessarily imply that an optimal charging structure should be based on

[11] We can interpret *RiC* as an *input* measure of reporting charges, while *RiY* can be interpreted as an *output* measure of reporting charges expressed in terms of reduced future growth.

[12] *RiC* and *RiY* are not the only measures of reporting charges. Recently, James (2000) has devised a new measure denoted *MP1* which is defined as the price of a *M*anaged *P*ortfolio that yields the market rate of return on £1. *MP1* takes into account not only the explicit charges associated with managing an active account, such as the annual management and custody fees, but also implicit costs, such those associated with actively trading the securities in the fund (that is, turnover costs).

contributions. Although it would be easy for consumers to understand, an important implication of a charging structure based solely on contributions is that the total charge will be independent of the realized return on investments. In contrast, a scheme with the bulk of its charges based on the fund value (and so performance-related) provides a strong statement about the scheme provider's own perception of his ability to deliver investment performance in excess of the assumed or projected rate. A scheme with charges levied principally on contributions offers the fund manager little incentive to achieve good performance, and places all of the risk of under-performance on the client.[13]

Changing charging structures and the impact of hidden charges

Funds change their charging structures on a regular basis,[14] which makes it difficult to compare funds over time and raises the question as to whether particular charging structures, and changes to them, are used to conceal the true impact of charges or whether the changes are actually in the clients' best interests.

A different issue relates to hidden charges. A recent survey of European fund management fees by Towers Perrin (1998) shows that some fund managers do not report their full set of charges. The three key charges are for asset management, broking (i.e. transaction execution) and custody. There are also charges for reporting, accounting and performance measurement. The survey reveals that some fund managers report the asset management fee (as some proportion of the value of the net assets under management) only *after* deducting broking and custody fees.[15] It should be noted that the survey finds that these practices are less prevalent in the U.K. than for continental plans and that it examines only the practices of *institutional* fund managers.[16] This lack of transparency can lead to incentive problems. Broking fees are related to turnover which provides an incentive to churn (i.e. overtrade) the portfolio; this is especially so if the transactions are executed by an in-house broker and the broking fee is hidden from the client. Some fund managers, in contrast, use discount brokers to reduce the cost to the client. Some clients impose turnover limits to reduce costs.

[13] To illustrate, in the case of the 25-year policy just discussed, and either a fund-based charge of 1.7 per cent of the annual fund value or a contribution-based charge of 22.9 per cent of each contribution, the total percentage take varies with the realized investment return as follows:

Realized return (%)	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
Fund-based charges	20.6	21.2	21.8	22.4	22.9	23.4	23.9	24.3	24.7
Contribution-based charges	22.9	22.9	22.9	22.9	22.9	22.9	22.9	22.9	22.9

[14] For example, see *Money Management*'s annual *Personal Pensions* publications.

[15] Some fund managers justify this on the grounds that both the portfolio transactions and the safe keeping are conducted by a third party independent of the fund manager, typically the global custodian. The survey also showed that other fund managers operate full "clean fees" (i.e. report full charges, including third-party fees which are merely passed through to the client). Yet other fund managers add a commission to third-party fees before passing them through. In some cases, however, the broker or custodian is related to the fund manager (e.g. is part of the same investment banking group) and in such cases it is more difficult to assess charges appropriately.

[16] However, those personal pension providers such as Skandia, whose funds are managed by institutional fund managers, might, nevertheless, be subject to them.

Retail fund managers in the U.K. are subject to a public disclosure regime in a way that U.K. institutional fund managers are not. Retail schemes are required to report "all explicit charges and expenses . . . and all other deductions and expenses which may or will bear upon the fund" (Financial Services Authority, 2000, section 6.6.19). However, while these expenses include the "costs of investment management", they explicitly exclude "dealing costs and costs associated with the routine management and servicing of existing property investments" (see, e.g. Institute and Faculty of Actuaries, 1999, section 9.2.6). There is also no disclosure requirement for retail funds to report turnover figures.[17] So even with retail funds, there is no real disincentive to churn the portfolio.[18]

There are also indirect hidden charges, for example, those imposed on consumers when they deviate from the planned payment schedule. One illustration of this relates to the treatment of paid-up policies (or PUPs), highlighted recently in an internal report commissioned by AXA Sun Life and widely reported (see, e.g. O'Neill, 1999, and Slade, 1999). As pension plan investments cannot be liquidated prior to retirement, policyholders who move to a new pension scheme have the choice of transferring their existing fund to the new scheme or leaving their assets in the original scheme, which is then converted into a PUP by the provider. Policies are also converted into PUPs when policyholders cease making contributions to their plans. The report finds that only 15 per cent of policyholders who terminate a policy early take transfer values, the rest leave paid-up policies with the original provider. While existing regulations require pension providers to disclose transfer values, there is no obligation to quote PUP maturity values, and few providers do so voluntarily.

Different providers compete on the basis of the transfer and full maturity values that they quote. However, PUP maturity values, which, in principle, should be related to transfer values, can turn out to be poor value for money, because the original providers can continue to extract similar charges to those that they would have done had the policy remained active.[19] For example, the report discusses the case of one company which quotes the highest transfer value amongst 12 leading providers, but ranks 12th for its PUP maturity value quote.

It seems anomalous that schemes are required only to quote transfer values when it is known that only 15 per cent of those policyholders not going to full term are likely to obtain this transfer value, while the remaining 85 per cent will receive the different, and unpublicized, PUP value. This means that investors who terminate a scheme early can face significantly higher costs (i.e. the losses arising from the transfer to PUP status) than would be expected from the published transfer values.

The impact of low persistency on charges

A regular premium pension scheme involves a substantial commitment of time and resources by both the scheme's sponsor and its members if the desired objectives are to be achieved. Any significant front-loading of charges in schemes means that members suffer a

[17] While life offices and other pension plan providers present turnover figures in their annual reports, there is no centralized collection and dissemination of this data and it would therefore be very expensive (at least in terms of time) for potential customers to compare turnover figures across providers.

[18] The *MP1* measure of James (2000) would capture the effect of churning, but would require the public reporting of turnover figures.

[19] See, e.g., the paid-up notes for the various personal pension scheme providers listed in *Savings Market* (1997).

substantial detriment if their contributions lapse prematurely. As the PIA argues, "if investors buy policies on the basis of good advice . . . they would not normally be expected to cancel premiums to their policies unless forced to do so by unexpected changes in their personal circumstances. This means that persistency can be a powerful indicator of the quality of the selling process" (1999, p. 3). The PIA defines persistency as "the proportion of investors who continue to pay regular contributions to their personal policies, or who do not surrender their single premium policy" (p. 3).

Table 4 shows that persistency rates (i.e. the percentage of policies that have not lapsed) after four years of membership are between 57 and 67 per cent. Although only data for the first four years of a pension plan are available, the table suggests that very few personal pension scheme members are likely to maintain their membership of the plan for long enough to build up an adequate pension.

The persistency rate is higher for schemes arranged by independent financial advisers than by company representatives, suggesting that the clients of the former are generally more satisfied with their policies than those of the latter. However, the one-year rates indicate a small improvement in the persistency rates for schemes arranged by company representatives since 1993 and a small decline in that for schemes arranged by IFAs. The effect of these two modest changes is that the difference in lapse rates fell by over 40 per cent between 1993 and 1997 with only a 4.3 percentage point difference in the lapse rates for one-year schemes between the two groups in 1997.

The PIA regards these persistency rates as "*disturbing*" (1998, p. 10) and offers a number of explanations: members were mis-sold pensions which were either unsuitable or too expensive; regular premium policies might be unsuitable for those with irregular earnings or uncertain long-term employment; a change of employment may lead to a member joining an occupational scheme and abandoning their personal one; adverse general economic conditions could worsen persistency rates. The PIA also offers suggestions as to why the IFAs are more successful than company representatives. First, IFAs tend to advise clients on higher incomes, who are more likely to continue contributing; second, policies chosen by an IFA are likely to be from a wider range of policies than those offered by representatives of any single company, leading to a greater likelihood of the policy matching more closely the particular needs of the client.

Table 4:
Persistency rates for regular premium personal pension plans, 1993–1997
(percentages)

	Company representatives: after				**Independent financial advisers: after**			
	1 Year	**2 Years**	**3 Years**	**4 Years**	**1 Year**	**2 Years**	**3 Years**	**4 Years**
1993	84.1	72.3	63.6	56.7	91.5	83.3	76.6	70.5
1994	83.8	72.7	64.3	57.2	90.9	81.2	73.5	66.9
1995	85.5	74.9	65.5		90.2	80.7	72.2	
1996	86.6	74.6			89.8	79.7		
1997	85.7				90.0			

Source: PIA, 1999, Table 1.

Adjusting reported charges for policy lapses

It is possible to incorporate the effect of policy lapses in the calculations of the *RiY* and *RiC*. Details of the calculations appear in appendix A.3, but the principal result is that the *lapse-adjusted reduction in yield* (*LARiY*) rises with higher average takes and falls with higher persistency. The latter result follows because the take at maturity is much higher than in earlier years, since the terminal value awarded in the final year (and therefore the corresponding charge) is a very high proportion of the total value of the fund. So strong persistency means that lower *LARiY*s are needed to achieve the same average take.

According to Chapman (1998),[20] the average *LARiY* in October 1998 was 2.5 per cent for a 25-year plan, and ranged from 0.9 per cent for Equitable (which had the highest assumed persistency rate over 25 years of 30 per cent) to 5 per cent for Guardian (which had the lowest assumed persistency rate of just 7 per cent). These persistency rates were based on the companies' own persistency experience for the first three years based on PIA November 1997 data and then projected forward from year four at the industry average annual lapse rate of 6.5 per cent. The industry average persistency rate over 25 years was assumed to be 16 per cent.

Appendix A.3 also shows how the *lapse-adjusted reduction in contributions* (*LARiC*) is calculated. The second panel of Table 3 presents both the *LARiY* and *LARiC* on the basis of the most recent annual lapse rates of company representatives' policyholders (see Table 4), namely 16.20, 13.25, 11.55 and 11.04 per cent for the first four years, and thereafter at 6.5 per cent per annum. It shows that lapses have a remarkable impact on the levels of charges reported. Because the likelihood of maintaining contributions for 25 years is so low, the effective contribution made by a typical policyholder over this period is expected to be just 38p for every £1 of gross contribution.

In summary, we can say that, in respect of U.K. personal pension plans, charging structures are highly complex and poorly understood by consumers, and that the *reduction in yield* method of reporting those charges is also not well understood. This could, in part, be because consumers perceive the *RiY* as something that comes out of a "black box". In view of this, we considered an alternative method of reporting charges, the *reduction in contributions*, based on what goes into the "black box". The *RiC* is very easy to understand even if the "black box" is not. It is also important for consumers to understand the consequences, in terms of a reduced fund value, of a policy lapsing, especially if charges are front-loaded. For this reason, we examined *lapse-adjusted RiY*s and *RiC*s and believe that the *LARiC* would be a powerful indicator summarizing both the impact of charges and the level of consumer satisfaction with a particular provider. However, charges (and the method of reporting them) is only one of the components of a personal pension plan. We turn now to another key component.

2. Realized investment performance

Investment performance plays a critical role with any funded pension scheme. For defined contribution schemes in particular, the asset growth rate is a crucial determinant of the size of the pension actually received. In addition, variability in the growth rate represents the investment risk that is faced by the policyholder. In any analysis of performance, it is

[20] Chapman's discussion is in terms of the *annual charge equivalent* (*ACE*) of a particular charging structure. Appendix A.3 shows that this always takes the same value as the *LARiY*.

important to distinguish between expected, or anticipated, returns and realized, or actual, returns. While the former can be increased by accepting greater risk, the latter can fluctuate widely, even for schemes with similar expected returns and risk profiles.

To our knowledge, there have been no systematic studies of the investment performance of the kind of schemes operated by U.K. life assurance organizations, the largest providers of personal pension schemes. The majority of schemes are invested in life office managed funds with only 20 per cent in life office unit-linked products or in unit trusts. The only recent published studies of investment performance in the U.K. relate to unit trusts and occupational pension funds. In this section, we examine the investment performance of these two classes of U.K. institutional investor. Given the broad similarity between unit trusts and the unit-linked schemes of life assurers, and between the managed funds of life assurers and those of occupational pension schemes, as well as both the highly concentrated nature of the U.K. fund management industry and the commonality of the incentives that operate throughout it, we believe that similar results would emerge from a study of the investment performance of the funds operated by life offices.[21]

The investment performance of unit-linked funds

Blake and Timmermann (1998) conducted a study of the investment performance of unit trusts (i.e. open-ended mutual funds) in the U.K.[22] Table 5 shows the distribution of returns generated by unit trusts operating in the four largest sectors. These figures indicate very large differences in performance, especially over the long investment horizons typical of pension plans. For example, the average 4.1 percentage point per annum difference between the best and worst performing unit trusts in the U.K. Equity Growth sector leads, over a 40-year investment horizon, to the accumulated fund in the top quartile being a factor of 3.2 times larger than the accumulated fund in the bottom quartile for the same pattern of contributions. The 5.9 percentage point per annum difference between the best and worst performing unit trusts in the U.K. Smaller Companies sector leads to an even larger fund size ratio after 40 years of 5.3.

This raises the possibility that scheme members, especially members of personal pension schemes, can find themselves investing in a poorly performing fund, and facing very high costs of transferring to a better performing fund. In addition, poorly performing funds might be expected either to close down, and their assets transferred to a different fund, or to be taken over by more efficient fund managers. Lunde, Timmermann and Blake (1999) investigated this possibility and found that underperforming unit trusts do eventually merge with more successful unit trusts, but that on average it takes some time for this to occur.

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[21] Discussions with insurance industry practitioners suggests that the quality of retail fund managers is significantly lower than that of institutional fund managers. If that is the case, then the results that we discuss below for the realized investment performance of institutional fund managers provides an upper bound on, rather than an approximation to, the performance that can be expected from retail managed funds. It has also been suggested to us that the variability of returns generated by institutional fund managers is likely to be lower than that generated by retail fund managers because the pressure placed on the former group by fund trustees not to underperform in comparison with competing funds (which translates directly into a herding effect) is absent with the latter group. If that is the case, then the results that we discuss below for the variability of investment performance of institutional fund managers provides a lower bound on, rather than an approximation to, the variability in performance that can be expected from retail managed funds. See also note 26 below.

[22] The data was provided by Standard & Poor's Micropal.

Table 5:
Distribution of returns generated by U.K. unit trusts, 1972–1995

Sector	Top quartile	Median	Bottom quartile	Ratio of fund sizes
U.K. Equity Growth	16.0	13.6	11.9	3.2
U.K. Equity General	14.3	13.4	13.1	1.4
U.K. Equity Income	15.4	14.0	12.4	2.3
U.K. Smaller Companies	18.7	15.5	12.8	5.3

Note: The first three columns are averages measured in percentages per annum for the sample period 1972–95; the last column gives the ratio of fund sizes after 40 years based on the top and bottom quartile returns. The formula is (assuming the same contribution stream):

$$\frac{(1+g_T)^N - 1}{g_T} \div \frac{(1+g_B)^N - 1}{g_B}$$

where g_T and g_B represent the top and bottom quartile growth rates from the table, and N represents the number of years (here 40).
Source: Blake and Timmermann, 1998, and Lunde, Timmermann and Blake, 1999.

Overall, about 40 per cent of trusts were eventually wound up or merged and Figure 1 shows the distribution of durations (i.e. lifetimes) of these trusts. The commonest duration is 4.25 years (51 months), but the average duration is about 16 years. Across the whole unit trust industry, the average return on funds that survived the whole period was 13.7 per cent per annum, while the average return on funds that were wound up or merged during the period was 11.3 per cent per annum. This implies that typical personal pension scheme members might find themselves locked into an underperforming trust that is eventually wound up or merged into a more successful trust, experiencing an underperformance of 2.4 percentage point per annum over a 16-year period. This translates into a fund value that is 19 per cent lower after 16 years than a fund that is not wound up or merged. So it seems that, in practice, personal pension scheme members cannot rely on the markets to provide them with a painless way of extricating themselves from an underperforming fund. They have to do it themselves, paying between 15 and 18 per cent of the value of their accumulated fund in transfer costs.[23]

The investment performance of managed funds

There are about 150,000 small defined benefit pension (mainly final salary) schemes in the U.K., most with fewer than 50 members. Virtually all these schemes are managed on a pooled basis by life offices. There are about 2,000 large schemes with assets above £100 million, including some 120 or so schemes with assets in excess of £1billion each.[24] The U.K.

[23] Personal Investment Authority (2000, Table 10). The limits of this range represent the average transfer charges after five years on a 25-year unit-linked personal pension plan arranged by IFA and company representatives, respectively. The same table reports transfer charges up to 52 per cent. Average transfer charges have been falling over time: Blake (1995, section 7.3.6) reports average transfer charges of around one-third for transfers taking place at the beginning of the 1990s.

[24] Pension Schemes Registry, Government Actuary's Department (forthcoming) and *Pension Funds and Their Advisers 1999*.

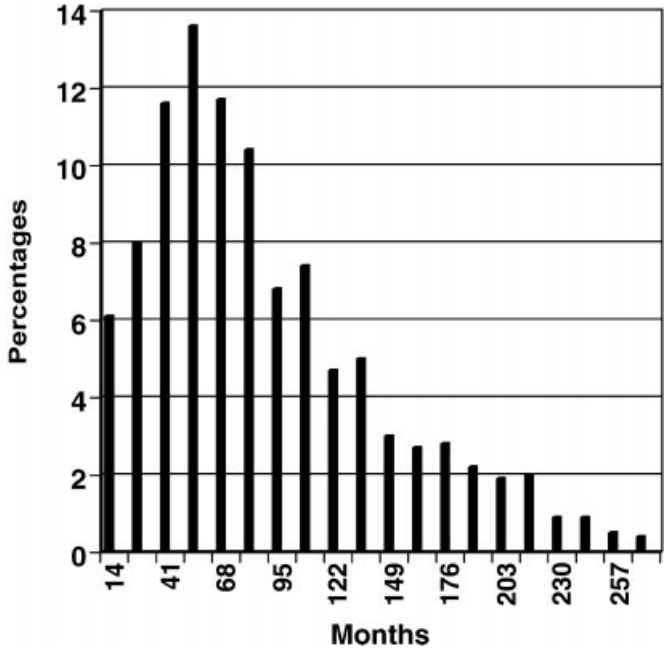

Figure 1: Duration of U.K. unit trusts from inception
Note: The histogram shows the distribution of the lifetimes in months of the 973 unit trusts which were wound or merged during sample period 1972–1995
Source: Lunde, Timmermann and Blake, 1999, Table 1.

pension fund management industry is highly concentrated and most of these managers come from just four groups of professional fund managers.[25] Because the benefits from these schemes are usually predetermined, the investment performance of these funds is much more important for the scheme sponsor than for the scheme member – in contrast with the personal pensions and unit trust industries.[26]

The investment performance of U.K. occupational pension fund managers between 1986 and 1994 has been investigated in Blake, Lehmann and Timmermann (1998). The dataset used covers the externally-appointed fund managers of more than 300 medium-to-large pension funds.[27]

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[25] Merrill Lynch Investment Management (formerly Mercury Asset Management), Phillips and Drew Fund Management, Schroder Investment Management and Gartmore Pension Fund Managers.

[26] The recent history of the U.K. pension fund industry embraces a period of substantial deficiency payments in the 1970s (arising from the U.K. stock market crash in 1974), and the build up of huge surpluses during the bull markets of the 1980s and 1990s. These surpluses have enabled sponsors to reduce their contributions into their schemes (i.e. to take employer's contribution holidays). Thus, during the 1980s and 1990s, U.K. occupational pension scheme sponsors have benefited enormously from the investment successes of their fund managers.

[27] The data set for this study was provided by the WM Company. Very similar results have been found for the U.S. , see Lakonishok *et al.*, 1992 and Elton *et al.*, 1993. For example, Elton *et al.* found that U.S. mutual fund managers underperform passive portfolios. Furthermore, after controlling for fund size, funds with higher fees and turnover underperform those with lower fees and turnover.

While the average or median performance has been very good over the sample period, the median return hides a wide distribution of performance. This can be seen from Table 6 which shows the distribution of returns realized by the pension funds in the sample over the period 1986–94 in the most important individual asset classes as well as for the total portfolio. Although, as the last row of the table indicates, the difference between the best and worst performing funds is very large, this conceals the fact that most funds attained very similar results. For example, 80 per cent of the funds surveyed achieved long-term returns within two percentage points of each other (i.e. just over one percentage point above or below the median performance); similarly, the interquartile range (i.e. the difference between the funds at the top of the second and the bottom of the third quartiles of the performance rankings) is also small, below two percentage points per annum for most asset classes and just over one percentage point for the total portfolio return. The median fund generated an average total return of 12.06 per cent per annum, which, as shown in Table 7, is just 12 basis points short of the average market return, and 80 per cent of the funds lie within one percentage point of the average market return. Thus, although some funds achieve extremely good (or bad) growth rates, the bulk of funds cluster very closely together. There are several explanations for this result:

- It is extremely difficult to beat the market (i.e. the average) consistently;
- Given the size of pension fund investments, it is difficult for managers to do anything other than invest the bulk of their funds in large, blue chip stocks. This results in many funds holding rather similar portfolios;
- It is a consequence of the widely reported *herding* effect by which managers, whose reputation is based on their *relative* performance against each other,[28] will tend to select very similar portfolios to avoid the loss of reputation which arises from relative underperformance;[29]
- The growth in popularity of index tracking would, again, tend to result in rather similar portfolios across funds.

Table 7 shows how well U.K. pension funds have performed in comparison with other participants in the market. The third column shows that the average U.K. pension fund underperformed the market average by 0.45 percentage points per annum, before deducting any fund management fee. Consistent with this, only 42.8 per cent of funds outperformed the market average. The main explanation for this poor performance is the relative underperformance in U.K. equities, combined with a large exposure to that market (the table shows that the average pension fund invested an average of 54 per cent of its assets in U.K. equities over the sample period). Relative performance was better in other asset categories,

[28] Davis (1988) reports a survey of U.K. and U.S. fund managers in which they acknowledge the existence of a herding effect. More recent studies from the U.S. confirm the importance (in the assessment of fund managers' performance) of their relative performance against a peer-group benchmark (see Brown, Harlow and Starks, 1996, and Chevalier and Ellison, 1997).

[29] While fund managers receive higher fee incomes if they generate higher fund values, earning greater returns usually also involves taking on greater risk, the result of which could be very poor performance relative to other fund managers, and this would be damaging for reputations. Thus, with charges based on fund values, the additional return that could be expected from choosing an active investment strategy that differed substantially from that of the median fund manager is unlikely to compensate for the risk of ending up in the fourth quartile and the resulting loss of reputation. The outcome is herding of both behaviour and performance, not only around the median fund manager, but also around the index.

Table 6:
Fractiles of total returns by asset class for U.K. pension funds, 1986–1994
(average annualized percentages)

	U.K. equalities	Internat'l equities	U.K. bonds	Internat'l bonds	U.K. index bonds	Cash/other	U.K. property	Total
Minimum	8.59	4.42	6.59	−0.64	5.59	2.67	3.05	7.22
5%	11.43	8.59	9.44	2.18	7.20	5.46	5.07	10.60
10%	11.85	9.03	9.95	7.56	7.81	7.60	6.58	10.96
25%	12.44	9.64	10.43	8.30	7.91	8.97	8.03	11.47
50%	13.13	10.65	10.79	11.37	8.22	10.25	8.75	12.06
75%	13.93	11.76	11.22	13.37	8.45	11.72	9.99	12.59
90%	14.81	12.52	11.70	14.55	8.80	14.20	10.84	13.13
95%	15.46	13.14	12.05	18.15	8.89	16.13	11.36	13.39
Max	17.39	14.68	17.23	26.34	10.07	19.73	13.53	15.03
Max−Min	8.80	10.26	10.64	26.98	4.48	17.06	10.48	7.81

Note: The table shows the fractiles of the cross-sectional distribution of returns on individual asset classes as well as on the total portfolio.
Source: Blake, Lehmann and Timmermann, 1998, Table 1.

Table 7:
Performance of U.K. pension funds in comparison with the market, 1986–1994
(percentages)

	Average market return	Average pension fund return	Average out-performance	Average portfolio weight	Percentage out-performers
U.K. equities	13.30	12.97	−0.33	53.7	44.8
International equities	11.11	11.23	0.12	19.5	39.8
U.K. bonds	10.35	10.76	0.41	7.6	77.3
International bonds	8.64	10.03	1.39	2.2	68.8
U.K. index bonds	8.22	8.12	−0.10	2.7	51.7
Cash/other investments	9.90	9.01	−0.89	4.5	59.5
U.K. property	9.00	9.52	0.52	8.9	39.1
Total	12.18	11.73	−0.45		42.8

Note: International property is excluded since no market index was available.
Source: Blake, Lehmann and Timmermann, 1998; 1999, Table 2.

particularly U.K. and international bonds, but the scale of investment in these asset categories was not large enough to counteract the relative under-performance in U.K. equities.

There are other features of U.K. pension fund performance worthy of note:

- The only evidence of spillover effects in performance is between U.K. and international equities; funds which performed well or badly in U.K. equities also tended to perform well or badly in international equities. However, there was no evidence of similar effects in performance across bond markets, which is surprising since the world's equity markets are less highly integrated than the world's bond markets.
- There is some evidence of a size effect in performance. Large funds tend to underperform smaller funds; for example, 32 per cent of the quartile containing the largest funds were also in the quartile containing the worst performing funds, whereas only 15 per cent of the quartile containing the smallest funds were also in the quartile of worst performing funds. These results confirm the often-quoted view that "size is the anchor of performance"; because large pension funds are the dominant players in the markets, their ability to outperform the market is severely restricted.

The final result concerns the active fund management abilities of U.K. pension fund managers, that is, their skill in outperforming a passive buy-and-hold strategy. The most important task of pension fund managers is to establish and maintain the strategic asset allocation (that is, the long-run division of the portfolio between the major categories of investment assets in a way that matches most closely assets to the accumulating liabilities). Although this can be achieved through a passive fund management strategy, fund managers often aim to add value through the active management of their fund's assets. There are two principal areas of active management: security selection and market timing (or tactical asset allocation). Security selection involves the search for undervalued securities (i.e. involves the reallocation of funds within asset categories) and market timing involves the search for

undervalued sectors (i.e. involves the reallocation of funds between sectors or asset categories).

The median total return earned by fund managers can be broken down into the following components (see appendix C):

Component	Percentage
Strategic asset allocation	99.47%
Security selection	2.68%
Market timing	−1.64%
Other	−0.51%
Total	100.00%

This breakdown reveals that, of the median total return of 12.06 per cent, 12.00 per cent (or 99.47 per cent of the total) was earned by the essentially passive, strategic asset allocation. In terms of active components, the average pension fund was unsuccessful at market timing, generating a negative contribution to the total return of −1.64 per cent. Security selection was more successful, making a positive contribution to the total return of 2.68 per cent. Even so, the overall contribution of active fund management was just over 1 per cent of the total return (or about 12 basis points per annum), which is less than the annual fee that active fund managers typically charge (which ranges between 20 basis points for a £500 million fund to 75 basis points for a £10 million fund).[30]

A range of implications can be drawn from this analysis:

- The performance of fund managers seems to be so heavily concentrated around the peer-group median that performance rankings are largely uninformative, because very small changes in performance of only a few basis points by a particular fund would produce very large changes in its ranking, without indicating any substantive change in the skill of the fund manager. Equally, the small numbers of managers at the extremes of the distribution have such large differences in performance between themselves, that even quite major changes in performance by one of these managers would result in no change in the rankings.
- The benchmark return against which fund managers are to be judged must be interpreted with considerable caution. To illustrate, one of the key benchmarks is the peer-group benchmark, but the peer-group does not remain constant over time as some managers will drop out (i.e. fail to survive) while other new ones will join. This makes it difficult to construct a consistent benchmark. In the case of some performance measurement services, the information on non-surviving funds is actually removed from their database. Since the non-surviving funds will generally have had poor performance prior to their demise, their deletion from the database will raise the average benchmark performance[31] and make the remaining funds appear to have worse performance relative to the now biased benchmark than was actually the case. Blake and Timmermann (1998) estimated the resulting bias to be approximately 0.8 per cent per annum for U.K. unit trusts.[32]

[30] *Pensions Management*, September 1998.
[31] This effect is called survivor bias or median drag.
[32] Using U.S. data, survivor biases of up to 1.4 per cent per annum have been reported, see Malkiel, 1995.

- There seems, on average, to have been a rather small return to active fund management over this period.

3. Expected investment performance

In the light of the analysis in the previous sections, it would be useful for consumers to determine whether there is any relationship between charges and performance. If there was, then one provider might have high charges that might be more than offset by the superior investment performance achieved by the fund. It is important to note that the performance of concern is *future* performance, which may or may not be linked to the past realized performance that was discussed in section 2. This section considers the link between past and future performance.

One way of assessing the value added of a particular scheme is to calculate the *expected net benefit* of a scheme which can be defined as:[33]

$$\text{Expected net benefit} = \text{Base fund value} + \text{expected superior performance} - \text{costs}$$

$$= \text{Base fund value} + \text{expected value added}$$

where the *base fund value* is the return from a corresponding passively managed zero-load fund.

However, there are problems with using such a measure as a basis for reporting the relationship between charges and expected performance:

- The results above suggest that there is a limit to how much superior performance could compensate for very high charges.
- As Table 6 showed, the bulk of funds generate returns that are very close to each other.[34] The difference between the best and worst funds is indeed large, but the difference between the 5th and 95th percentile of funds is quite small. As we have already argued, this means that most rankings will be very sensitive to small variations in market conditions and these variations in rankings will be economically insignificant. It is therefore very unlikely that any measure of expected superior performance would be sufficiently robust to differentiate clearly between two middle-ranked firms.
- The greatest difficulty with the implementation of the *expected net benefit* approach is that it would require estimates of *expected* superior performance over the investment horizon, rather than *past* superior performance. Unfortunately, there is no way in which expected performance can be reliably estimated. Modern finance theory and evidence suggests that, in an efficient financial system, it is impossible to achieve consistently superior net investment performance.[35] While there may be differences in the academic literature about the degree of financial market efficiency at the margin, there is no academic support for the proposition that an institutional investor is able to obtain consistently superior investment performance over extended periods of time, after taking into account risk, research costs and trading costs. Similarly, while in any given period some investors will perform better than the average and others will perform worse, there is nothing in the

[33] James (2000)'s *MP1* accounts for these factors in a different way.

[34] Although, as we have already stated, the dispersion of returns on retail funds might be somewhat wider than those reported here for institutional funds.

[35] See, e.g. Blake, 2000, chapter 11.

academic literature to suggest that any out-performance will persist over any extended period.

Table 8 provides empirical evidence that is consistent with this theoretical view. It shows the consistency of performance for each of three non-overlapping five-year periods achieved by a large number of U.K. occupational pension funds. The table reveals that, across all three periods, only 4 per cent of funds managed to achieve above-average performance in each of the five years, while another 4 per cent of funds underperformed in each of the five years. About half the funds had superior performance in three or more years and about half had below average performance in three or more years. Comparing these figures with those in the final column confirms that this distribution is almost exactly what would be expected if above- (or below-) average performance arose entirely by chance in each year. This pattern is found consistently in each of the three five-year periods and is not affected by whether the investments considered are U.K. equities or more broadly based portfolios. Similar results were found for U.K. unit trusts for periods in excess of three years.[36]

Other studies have found some evidence that consistency of performance was possible, particularly in the top and bottom quartiles, but only over very short horizons. For example, Blake, Lehmann and Timmermann (1998) found that in the case of occupational pension funds, U.K. equity managers in the top quartile of performance in one year had a 37 per cent chance of being in the top quartile the following year, rather than the 25 per cent that would have been expected if relative performance arose purely by chance. Similarly, there was a 32 per cent chance of the U.K. equity managers in the bottom quartile for one year being in the

Table 8:
Consistency of pension fund performance
(percentages)

Years above average	Total fund				U.K. equities				
	1980–84	1985–89	1992–96	Mean	1980–84	1985–89	1992–96	Mean	Chance
5	3	3	5	4	2	5	5	4	3
4	25	18	17	20	14	18	21	18	16
3	26	28	28	27	35	26	28	30	31
2	25	34	35	31	31	27	26	28	31
1	15	14	13	14	15	18	15	16	16
0	6	3	2	4	3	6	5	4	3

Note: The table shows the percentage of funds achieving the stated number of years of above-average performance during each five-year period. The final column shows the percentages that would be expected if fund performance was purely random.
Source: CAPS *General Reports* 1985, 1989, 1996.

[36] The (short-term) underperformance in this section refers to funds that continue in existence and temporarily generate below-average performance. In contrast, the (long-term) underperformance analysed in section 2 refers to funds that eventually "die" because of their systematic poor performance.

bottom quartile the following year. There was also evidence of consistency in performance in the top and bottom quartiles for cash/other investments, with probabilities of remaining in these quartiles the following year of 35 per cent in each case. However, there was no evidence of consistency in performance for any other asset category or for the portfolio as a whole. Nor was there evidence of any consistency in performance over longer horizons than one year in any asset category or for the whole portfolio. Lunde, Timmermann and Blake (1999) found similar results for unit trusts: for example, a unit trust specializing in U.K. equity which was in the top quartile in one year had a 33 per cent chance of remaining in the top quartile the following year, while there was a 36 per cent chance of it remaining in the bottom quartile for two consecutive years. This evidence is consistent with the suggestion that so-called "hot hands" in investment performance is a short-term phenomenon which does not persist for the extended periods that would be needed to justify the widespread use of measures which use past performance as an indicator of expected future performance.[37]

The evidence in the previous section does, however, allow the rather limited suggestion that *gross* superior performance is possible, but only at the expense of matching higher investment costs.[38] Furthermore, the academic argument behind the view that net long-run returns to investors will be the same whether or not they engage in costly research is powerful[39] and implies that assuming that particular funds will outperform (net of risk and transactions costs) in the future, even if they have outperformed temporarily in the past, cannot be justified.

The evidence of this section implies that, because future performance is unpredictable, the *expected net benefit* approach is unlikely to prove to be a useful way of assessing the value added of a pension plan.

4. Conclusions

The analysis above has revealed a number of key issues confronting the pensions industry in the U.K.:

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[37] Again very similar results have been found in the U.S. (see Grinblatt and Titman, 1992, Hendricks *et al.*, 1993, Brown and Goetzmann, 1995, and Carhart, 1997). For example, Carhart (1997) argues that the short-term persistence effect identified by Hendricks *et al.* (1993) is mostly driven by the one-year momentum effect found by Jegadeesh and Titman (1993). However, individual funds do not, on average, earn higher returns from following a momentum strategy, but rather because they happen by chance to hold relatively large positions in the previous year's winning stocks. The only persistence that is significant is concentrated in strong underperformance by the worst-return mutual funds. Carhart's findings do not therefore support the existence of skilled or informed mutual fund portfolio managers because: "hot hands" funds infrequently repeat their abnormal performance; transactions costs consume gains from following a momentum strategy in stocks; and expense ratios, portfolio turnover costs and load fees are significant and negatively related to performance.

[38] These costs, typically for increased research, will usually be passed on to the policyholders. See also note 39 below.

[39] The theoretical justification for this position was originally stated by Grossman and Stiglitz (1980) who demonstrated that an efficient equilibrium in financial markets is characterized by all investment strategies generating the same *net* returns, after allowing for differences in risk, research costs and transactions costs. This means that, in equilibrium, there is no incentive for any investor to change their investment strategy. It also means that the *gross* return to investors who engage in research must be higher than the *gross* return to those who do not. However, the increased return must be exactly offset by the costs of this research, so that the net returns to all strategies is the same. If the extra return exceeds the costs, there are incentives for more people to engage in research, which will drive down the profits from such research; if it is less then some investors will cease research, raising the gains to those who remain engaged in research.

- Charging structures tend to be complex, disguised and front-loaded.[40] As surveys by the Office of Fair Trading and others confirm, such charging structures can have the effect of confusing consumers to such an extent that they are unable to assess whether the scheme they are being invited to participate in for a substantial period of time and with a substantial commitment of resources offers value for money.
- Despite the penalties for early exit, very high lapse rates are also observed. However, there is no requirement for firms to disclose their lapse rates, to disclose their PUP terms, or to disclose their charges for policies which are not carried to maturity.
- Fund performance tends to be very tightly clustered around the average. This makes the ranking of funds difficult to interpret, as small variations in performance might make a substantial, but economically insignificant, difference to the ranking.
- There is no evidence of superior performance from active fund management that is capable of being sustained over the long life of a pension plan. Furthermore, there is no requirement to report turnover data, a key measure of the degree of active fund management.
- Measures of value added that involve projections of above-average investment performance into the distant future are likely to be highly misleading.

In view of these findings, we offer the following suggestions for improving value added in the pensions industry:

- One way of keeping charges down is full fee disclosure for each function provided by the scheme provider, including dealing costs in the case of actively managed funds. This, in turn, would require the public reporting of turnover data by actively managed funds.
- The high lapse rates experienced by policyholders make it important to investigate and implement appropriate incentive systems for sales staff and others involved in dealing with policyholders that enable policyholders to establish the most appropriate plan for their needs and then encourages them to maintain a *long-term* commitment to it. One way of doing this is through back-loaded rather than front-loaded remuneration packages for sales staff whereby the remuneration of sales staff rises with the length of time that a policy is maintained. In addition, individual providers' lapse rates should be published.
- The difficulty that retail customers have with understanding *reduction in yield* suggests that the alternative *reduction in contributions* might be a more appropriate measure of value added. In addition, the *lapse-adjusted reduction in contributions* should also be reported as a measure of the *long-term* satisfaction of the plan provider's clients.[41]
- It would be wrong and would also eventually lead to market inefficiencies if fund managers were required to invest only in passive index funds. Active fund managers can help to make markets efficient.[42] One way of rewarding active fund managers is through the use of performance-related fees. However, such fees would have to be appropriately designed to remove any incentive on the part of fund managers to take on excessive risks. Such fees provide an element of common interest between policyholder and provider, as good performance has a direct benefit to both parties and the unavoidable risk of underperformance is also shared.

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[40] It has been reported (*Pensions Week,* 22 March 1999*)* that, following the release of the FSA guidance note on pensions selling, front-loaded commission payments to IFAs on pensions products could end.

[41] As economists we greatly admire James (2000)'s *MP1* measure, but also feel that, like *RiY*, it would be rather difficult for consumers to understand.

[42] This was pointed out by James (2000).

- Economic theory, supported by the demonstrated inability of funds to sustain consistent performance over extended periods, makes the use of past investment returns to project future performance hard to support.
- If pension providers wish to improve value added in the pensions industry, they should compete on the basis of their charges, rather on the basis of their past performance or their promised future performance.

Overall, it is hard to disagree with the Office of Fair Trading: "*The best way* [to run a simplified defined contribution pension scheme] *is to embrace passive fund management, thus requiring funds to compete in terms of their administration costs, not their spurious promises of future excess returns*."[43] This argument follows because in a world of increasingly efficient capital markets, fund management (the most important component of a personal pension plan) is becoming a commoditized service. Other key services, such as plan administration, are also now commoditized. This, in turn, suggests that personal pension plans are, in effect, commoditized products which therefore ought to compete on the basis of cost rather than a spurious notion of superior quality.

There are also now strong external pressures on the U.K. personal pensions industry to improve its value added by reducing its charges. These come from the U.K. government's Welfare Reform and Pensions Act 1999 which introduces *stakeholder pensions* from 2001 with a maximum charge of 1 per cent per annum of fund value. New low-cost collective investment vehicles (authorized unit trusts, investment trust companies and open-ended investment companies) will be permitted to offer stakeholder pensions in direct competition with life offices (HM Treasury, 1999). Despite the fact that "*the pensions industry has undergone a massive transformation in terms of the level and structure of its charges*" (Chapman, 2000, page 60), the current average charge for personal pension schemes (1.2 per cent for 25-year plans and 2.5 per cent for ten-year plans in 1999) are still too high for such schemes to be repackaged as stakeholder pension schemes. *Personal pension plans: 1988–2001. RIP!*

Appendix A. Charges

This appendix analyses the charging elements of typical personal pension plans. To illustrate the effects of charges, we define the following terms:

V_T Maturity value of the fund at the end of period T.

V_t Value of the fund at the end of period t; t will have the value 0 at the start of the scheme and T at the end of the last period of contribution (if the scheme goes to maturity).

g_t Growth rate in the fund's value in period t.

C_t Contribution made in period t. We assume that contributions are made at the beginning of each period and that contributions grow at an annual rate of e% (for example, the rate of growth might reflect the growth rate in national average earnings). Thus: $C_t = C_{t-1} \times (1 + e_{t-1})$, where $e_0 = 0$ and $C_0 = C$.

M_t Policy fee in period t. This is assumed to be uprated at the rate of i% per annum (for example, i might be related to the rate of change in the retail price index). Thus: $M_t = M_{t-1} \times (1 + i_{t-1})$, where $i_0 = 0$ and $M_0 = M$.

[43] Office of Fair Trading, 1999b, p. 2.

f Fund management fee (expressed as a proportion). This is assumed to be paid annually on the fee date and to be proportional to the value of the fund at that date.

a Allocation of contributions to units, including the levies on any capital units and any loyalty bonuses (expressed as a proportion).

s Bid–offer spread on contributions (expressed as a proportion).

x_t Redemption fee payable at maturity (when $t = T$), transfer fee payable when the policy is transferred (where $t < T$) or fee associated with conversion of the policy to paid-up status (also where $t < T$, but may continue to be paid up to T); prior to any of these events, $x_t = 0$.

F_0 Policy set-up fee (e.g. the independent financial adviser's (IFA's) fee), paid at the start of the policy.

The value of the fund in period t is then given by the following iterative equation:

$$V_t = \{V_{t-1} + a(1-s)C_{t-1}(1+e_{t-1}) - M_{t-1}(1+i_{t-1})\}(1-f)(1+g_t)(1-x_t) \tag{1}$$

where in the case of $t = 1$, V_0 is replaced by $-F_0$. This can also be expressed as:

$$V_t = -F_0(1-f)^t \prod_{k=1}^{t}[(1+g_k)(1-x_k)] + \sum_{m=1}^{t}\left\{a(1-s)C\prod_{k=0}^{m-1}(1+e_k) - M\prod_{k=0}^{m-1}(1+i_k)\right\}(1+f)^{t+1-m}\prod_{k=m}^{t}[(1+g_k)(1-x_k)] \tag{2}$$

In equation (2), C represents the amount contributed by the policyholder (which is uprated annually by e_t), while the g_t terms measure the returns on the fund. All other terms are related to charges.

A.1 Reduction in yield

The complexity of equation (2) means that there is no simple summary measure for the impact of charges. The conventional approach is to calculate the reduction in yield (RiY) resulting from the charges.

Suppose that g is the constant growth rate for the fund assumed by the regulator. Equation (2) can be used to project the value of the fund in period t based on this assumed growth rate:

$$V_t = -F_0[(1-f)(1+g)]^t \prod_{k=1}^{t}(1-x_k) + \sum_{m=1}^{t}\left\{a(1-s)C\prod_{k=0}^{m-1}(1+e_k) - M\prod_{k=0}^{m-1}(1+i_k)\right\}[(1-f)(1+g)]^{t+1-m}\prod_{k=m}^{t}(1-x_k) \tag{3}$$

The RiY is defined as the difference between the assumed return (g) on the fund and the fund's internal rate of return or *effective yield* (g'), which is equal to the yield on a hypothetical zero-

load or charge-free scheme[44] with the same gross contributions and having the same terminal value as the scheme in question. Hence, g' is the solution to the following equation:

$$V_t = \sum_{m=1}^{t} \left\{ C \prod_{k=0}^{m-1} (1 + e_k) \right\} (1 + g')^{t+1-m} \tag{4}$$

where V_t is defined in (3). The reduction in yield is defined as:

$$RiY = g - g' \tag{5}$$

The higher the charges, the lower will be the net contributions invested; hence, the lower will be g' and the larger will be the reduction in yield.

A.2 Reduction in contributions

Reduction in yield is not the only method for reporting charges. There is an alternative method based on contributions: the *reduction in contributions* (*RiC*). This is defined as the difference between the gross contributions (C) into a scheme and the scheme's *effective contributions* (C'), as a proportion of gross contributions. Effective contributions are equal to the contributions into a hypothetical zero-load scheme with the same assumed return and having the same terminal value as the scheme in question. The effective contribution is therefore the value of C' which solves the following equation:

$$V_t = \sum_{m=1}^{t} \left\{ C' \prod_{k=0}^{m-1} (1 + e_k) \right\} (1 + g)^{t+1-m} \tag{6}$$

where V_t is defined in (3). The reduction in contributions is defined as:[45]

$$RiC = (C - C')/C \tag{7}$$

Since the left-hand sides of equations (4) and (6) are identical, the right-hand sides must equal each other, which implies that the *RiC* is related to the gross and effective yields as follows:

$$RiC = 1 - \left[\sum_{m=1}^{t} \left\{ \prod_{k=0}^{m-1} (1 + e_k) \right\} (1 + g')^{t+1-m} \right] \Bigg/ \left[\sum_{m=1}^{t} \left\{ \prod_{k=0}^{m-1} (1 + e_k) \right\} (1 + g)^{t+1-m} \right] \tag{8}$$

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[44] That is, a scheme which $a = 1$, $s = 0$, $M = 0$, $f = 0$, $x = 0$, $F_0 = 0$ in equations (1) to (3).

[45] It is easy to show that the reduction in contributions is equal to the total compounded charges as a proportion of gross terminal fund value:

$$\begin{aligned} \frac{\text{Total compounded charges}}{\text{Gross terminal fund value}} &= \frac{\displaystyle\sum_{m=1}^{t} \left\{ (C - C') \prod_{k=0}^{m-1} (1 + e_k) \right\} (1 + g)^{t+1-m}}{\displaystyle\sum_{m=1}^{t} \left\{ C \prod_{k=0}^{m-1} (1 + e_k) \right\} (1 + g)^{t+1-m}} \\ &= \frac{C - C'}{C} \\ &= RiC \end{aligned}$$

A.3 Adjusting for lapse rates

Suppose a lapse occurs in period L (where $0 < L < T$). The value of the fund when the policy is converted to a PUP is:

$$V_L = -F_0(1-f)^L \prod_{k=1}^{L}[(1+g_k)(1-x_k)] + \sum_{m=1}^{L}\left\{a(1-s)C\prod_{k=0}^{m-1}(1+e_k) - M\prod_{k=0}^{m-1}(1+i_k)\right\}(1-f)^{L+1-m}\prod_{k=m}^{L}[(1+g_k)(1-x_k)] \tag{9}$$

The value of the PUP in any subsequent period t (where $L < t < T$) is:

$$V_{Lt} = V_L(1-f)^{t-L}\prod_{k=L+1}^{t}[(1+g_k)(1-x_k)] - \sum_{m=L+1}^{t}\left\{M\prod_{k=0}^{m-1}(1+i_k)\right\}(1-f)^{t+1-m}\prod_{k=m}^{t}[(1+g_k)(1-x_k)] \tag{10}$$

where, depending on the policy, M and x_k may be positive for each period between L and t.[46]

If we define q_t as the lapse rate in period t by policyholders from a particular provider, the expected value of a fund from that provider in period t is:

$$\begin{aligned} V_t^* &= \sum_{L=1}^{t}\Pr(\text{lapse in period } L|\text{no lapses before } L)\times \text{Value of fund at } t \text{ if lapsed at } L \\ &\quad + \Pr(\text{no lapses before } t)\times \text{Value of unlapsed fund at } t \\ &= \sum_{L=1}^{t}\prod_{k=0}^{L-1}(1-q_k)q_L V_{Lt} + \prod_{k=0}^{t}(1-q_k)V_t \end{aligned} \tag{11}$$

where $q_0 = 0$ and the product of the $L-1$ terms $(1-q_k)$ measures the persistency rate over $L-1$ periods.

The *lapse-adjusted reduction in yield* (*LARiY*) experienced by the provider's policyholders will depend on the effective yield (g^*) that solves:

$$V_t^* = \sum_{m=1}^{t}\left\{C\prod_{k=0}^{m-1}(1+e_k)\right\}(1+g^*)^{t+1-m} \tag{12}$$

where V_t^* is defined in (11). The lapse-adjusted reduction in yield is given by:

$$LARiY = g - g^* \tag{13}$$

An alternative method of accounting for lapse rates has recently been proposed by Chapman

[46] Estimates by Shuttleworth (1997) indicate that pension providers extract similar charges on PUPs as for active accounts. They are required to apply the same growth rate on PUPs as on active accounts.

(1998). He defines the *annual charge equivalent* (*ACE*) as the single annual charge (as a proportion of fund value) that gives the same average annual take as a company's current range of charges when the company's lapse rates are taken into account.

The ACE, denoted h below, is calculated as the solution to:

$$V_t^* = \sum_{m=1}^{t} \left\{ C \prod_{k=0}^{m-1} (1 + e_k) \right\} [(1 + g)(1 - h)]^{t+1-m} \tag{14}$$

However, the *ACE* always takes the same value as the *LARiY*, as can be seen by comparing equations (12) and (14). Since the left-hand sides of these equations are identical (and defined by equation (11)), the right-hand sides must equal each other, which implies that:

$$(1 - h)(1 + g) = (1 + g^*) \tag{15}$$

and, hence, that:

$$LARiY = g - g^* = h - hg \approx h \tag{16}$$

since hg is negligible. Thus the *ACE* and *LARiY* are equivalent measures.

Finally, the *lapse-adjusted reduction in contributions* (*LARiC*) is found by substituting the effective yield (g^*) from equation (12) for (g') in equation (8).

Appendix B. Performance-related fees

Performance-related fees typically take one of two forms: a simple proportion of the absolute value of the fund, or a proportion of the difference between the fund's realized performance and a benchmark.

The first form is less extreme from the viewpoint of the fund manager since it does not involve refunds and can be specified as:

$$\text{Performance-related fee in period } t = f_i V_t \tag{17}$$

where f_i is the fee if the fund manager's return is in the i^{th} quartile.

An example of this fee structure is presented in Figure 2 which shows the fees payable from a sample fund which uses performance-related fees, based on a Monte Carlo simulation.[47] The 90 per cent confidence interval for the fees lies between 0.22 and 0.45 per cent per annum, while there is a 25 per cent chance that the fee will exceed 0.37 per cent per annum and a similar chance that it will be less than 0.31 per cent per annum. A mean annual charge of 0.34 per cent implies a total take of approximately 8.9 per cent of the terminal fund value.

The second form is likely to provide a stronger incentive to fund managers because it rewards only performance over and above the benchmark and does not offer a reward for simply tracking the benchmark. In this case, the fee is determined as some proportion, f_1, of the difference between the fund's realized performance and some benchmark, $g^{\#}$, plus a fee, f_2, to cover the fund manager's overhead costs based on the absolute value of the fund:

$$\text{Performance-related fee in period } t = f_1(g_t - g^{\#})V_t + f_2 V_t \tag{18}$$

[47] The Monte Carlo simulation assumes the following: a fund with a 25-year investment horizon, a distribution of returns which is normal with a mean of 9 per cent per annum and a standard deviation of 18 per cent, and 1000 replications. Based on long-run returns reported in BC (1998), such a portfolio would be invested 35 per cent in equities and 65 per cent in bonds.

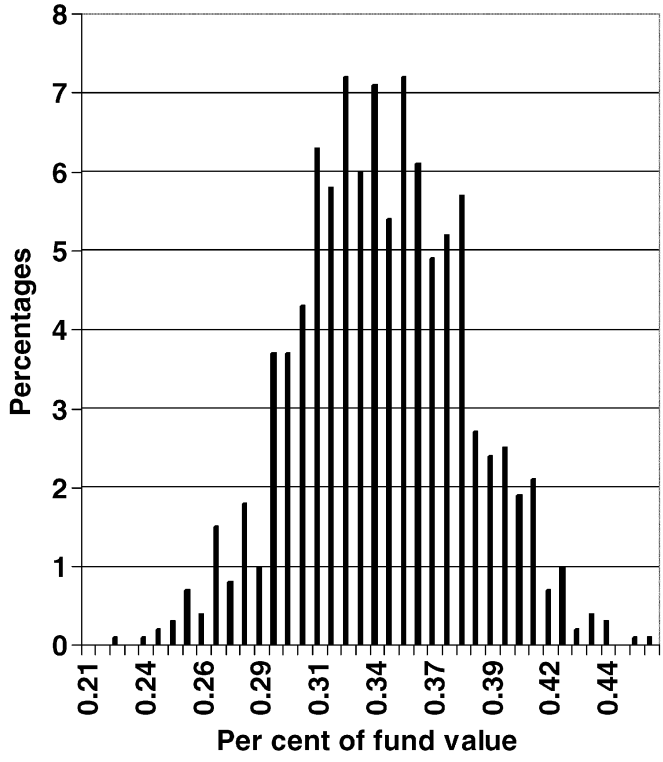

Figure 2: Frequency distribution of performance-related fees
Note: The frequency diagram shows the distribution of performance-related fees in a fund with fees calculated according to the following performance scale:

Quartile rank	*Fee (%)*
1st	0.59
2nd	0.44
Median	0.34
3rd	0.24
4th	0.09

This rewards good *ex post* performance and penalizes poor *ex post* performance. Whatever promises about superior *ex ante* performance had been made by the fund, the fund would have to accept a reduced fee or even pay back the client if g_t was sufficiently below $g^{\#}$ (although the latter case generally involves credits against future fees rather than cash refunds). This fee structure also provides a strong incentive against taking excessive risks since fund managers who do so face the chance of losing money. In contrast, the fee structure in (17) only reduces fees if the fund manager both takes risks and produce very poor performance.

Appendix C. Decomposition of fund performance

The following decomposition of the total return on the portfolio is due to Brinson *et al*. (1986). Assume that there are M asset categories in the portfolio and define:

θ_{ajt} = actual weight in asset class j at time t,
θ_{sjt} = strategic asset allocation in asset class j at time t,
r_{ajt} = actual return on asset class j at time t,
r_{sjt} = strategic return on asset class j at time t.

As an accounting identity:

$$\sum_{j=1}^{M}\theta_{ajt}r_{ajt} = \sum_{j=1}^{M}\theta_{sjt}r_{sjt} + \sum_{j=1}^{M}\theta_{sjt}(r_{ajt} - r_{sjt}) + \sum_{j=1}^{M}(\theta_{ajt} - \theta_{sjt})r_{sjt} + \sum_{j=1}^{M}(\theta_{ajt} - \theta_{sjt})(r_{ajt} - r_{sjt}) \tag{19}$$

that is:

$$\text{Total Return} = \text{Strategic Return} + \text{Return from Security Selection} + \text{Return from Market Timing} + \text{Residual Return}.$$

The strategic asset allocation is typically specified by the client in the light of an asset-liability modelling exercise. The strategic return is the return on an agreed benchmark, such as a market or peer-group index.

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