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THE FINANCIAL MANAGEMENT OF UNIT TRUST AND INVESTMENT COMPANIES

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ABSTRACT

This paper describes the application of actuarial techniques to the financial management of unit trusts and other collective investment schemes. The main features of collective investment schemes are described and the financial issues facing managers of these schemes are highlighted. The unit trust industry in particular is facing a number of potentially significant changes and the paper explores the areas in which the actuarial profession can add value to this industry.

KEYWORDS

Collective Investment Schemes; Unit Trusts; Investment Trusts; Open Ended Investment Companies; Derivatives; Financial Management; Profit Test; Embedded Value; Appraisal Value; Investment Modelling

1. INTRODUCTION

1.1 The authors of this paper are all members of a Collective Investment Schemes Working Party formed under the Wider Fields Board of the Institute and the Faculty of Actuaries, which was set up in July 1994. The main objective in setting up the working party was to help promote the involvement of actuaries in the field of collective investment schemes.

1.2 The paper aims to increase the understanding of collective investment schemes within the actuarial profession, and to explore whether life office techniques developed by actuaries for financial management and reporting purposes can be usefully applied to unit trusts and other collective investment schemes.

1.3 Section 2 concentrates on the first of these aims and gives an overview of United Kingdom collective investment schemes. Section 2.1 provides a general description of the main vehicles under consideration, namely unit trusts, investment trusts, personal equity plans and open-ended investment companies. Section 2.2 comments on the environment in which these schemes operate and how this has affected their development. Taxation is covered in Section 2.3, whilst Section 2.4 explores the framework in which derivatives may be used. Sections 2.5 and 2.6 seek to explain the regulation and practice of unit trust pricing.

1.4 Section 3 addresses the second aim. The techniques developed for the financial management of life offices have been the subject of a number of papers

presented to the Institute over the years. This paper concentrates on the application of these techniques to collective investment schemes. We begin Section 3 with an examination of experience analysis, followed, in Section 3.2, by a brief explanation of how a unit trust manager might manage his own stock of units ('box management'). Section 3.3 shows how the concepts of control cycles and embedded value reporting can be applied to collective investment schemes, whilst Section 3.4 considers the extent to which appraisal values are applicable to fund management companies. The investment trust discount is examined in Section 3.5. Sections 3.6 and 3.7 look briefly at the applicability of investment modelling techniques and risk assessment to the collective investment schemes environment.

1.5 Finally, in Section 4, we draw some general conclusions on the challenges facing the collective investment schemes industry and the contribution actuaries can and should make in the future to the management of collective investment schemes.

2. BACKGROUND TO COLLECTIVE INVESTMENT SCHEMES

2.1. *Overview*

2.1.1 *Unit trusts*

2.1.1.1 A unit trust is a pooled investment vehicle formed to hold investments on behalf of the beneficiaries of the trust (usually called unit holders). It allows unit holders to achieve a diversification of risk and professional investment management. The assets of the trust are held by a trustee and are managed by a unit trust manager, who is responsible for investment management, fund accounting, pricing, dealing and reporting.

2.1.1.2 Collective investment schemes, of which unit trusts are the leading example, are governed by the Financial Services Act 1986 (FSA). The Department of Trade and Industry (DTI) has delegated to The Securities and Investments Board (SIB) most of its powers under the FSA to authorise unit trusts and to make regulations concerning their constitution and management. In order to be marketed to the public, a unit trust scheme must be authorised.

2.1.1.3 The main regulations governing unit trusts are The Financial Services (Regulated Schemes) Regulations 1991 (the 1991 regulations). These contain the secondary legislation relating to the constitution and management of authorised unit trust schemes, and cover aspects such as:

— pricing and dealing in units, including the calculation of maximum and minimum prices;
— payments and benefits to managers and trustees;
— calculation of income distributions and 'equalisation';
— the appointment of auditors, the keeping of records and the publication of accounts;
— the investment and borrowing powers; and
— the powers and duties of the managers and trustees.

2.1.1.4 The FSA requires the manager and trustee to be corporate bodies, independent of each other. Typically the trustee will be one of the major banks. The principal duties of the trustees are:

— to act as the legal holder of the securities, and act as their custodian;
— to maintain a unit trust register;
— to distribute the income arising from the underlying securities;
— to issue unit trust certificates, where appropriate; and
— to ensure that the managers conform with the regulations, the trust deed and its investment objectives. In particular, the trustee must undertake detailed checks on the pricing procedures of the managers.

2.1.1.5 The trustees' remuneration is a matter for negotiation between them and the managers, and the amounts received will depend, in part, on which statutory duties are carried out on behalf of the trustees by the managers. For example, it is common practice for the managers to maintain the unit trust register, distribute income and issue certificates, although it is the trustees who are ultimately responsible. The trustees' fee may also depend on the status of the manager and the performance of the fund.

2.1.1.6 The trustees have the right to remove the managers of the fund in certain circumstances, such as where they feel that the investment objectives of the fund are not being met. The managers have no right to remove the trustees. In practice, however, there are a number of instances of managers persuading trustees to resign, but, as far as we know, none of trustees removing the managers.

2.1.1.7 Unlike the units in a life assurance company's internal fund, which may be notional and designed primarily to offer a convenient method of accounting and of determining policyholders' benefits, the units in a unit trust are real. They are securities in the same way as ordinary shares in a public company. Units may be bought and sold just like ordinary shares, although they differ in that the price is related to net asset value under pricing rules set out by the SIB.

2.1.1.8 An authorised unit trust is required to distribute all of its income every year.

2.1.1.9 The types of security that can be held by an authorised unit trust have been extended over the last few years, and, as well as equities and gilts, unit trusts can now invest in a wide range of markets and instruments, including property, futures and options. Trusts may enter into arrangements, such as back-to-back loans for the purpose of currency hedging, and may borrow short term up to 10% of net asset value.

2.1.2 *Investment trusts*

2.1.2.1 Investment trusts are public companies (not trusts) whose business is the management of securities on behalf of their shareholders. Investment trusts are defined under Section 842 of the Income and Corporation Taxes Act (ICTA)

1988, but are formed under, and controlled by, the Companies Acts. An investment trust has a board of directors, like any public company, which is answerable to its shareholders. Usually the board of directors will appoint a management team for the day-to-day decisions on investment of the trust's assets, and for administration.

2.1.2.2 Investment trusts may apply for approval from the Inland Revenue, which means that they are not subject to capital gains tax on dealings within the company. To obtain approval, an investment trust needs to be resident in the U.K. for tax purposes, to be listed, to distribute the bulk of its income and is not allowed to trade (as distinct from investing) in securities and property.

2.1.2.3 Many investment trusts are quoted. An investment trust is bound by statutory stock exchange rules on accounting and disclosure.

2.1.2.4 Investment trusts have other important differences from unit trusts:

— Their share prices may either stand at a discount to the net asset value of the investment portfolio, or at a premium.
— They may invest in a wider range of assets than is permitted for unit trusts, for example in life policies or residential property.
— As a public company, an investment trust is permitted to borrow to a greater extent than is permitted for a unit trust. Borrowing, also known as gearing, can be used to enhance potential returns when a market is rising, but also has the effect of reducing returns when the market is falling.
— The investment trust may have a capital structure under which different classes of shareholders have different rights. For example, for a simple split level trust, one class of ordinary shareholder is entitled to all the trust's income and another to its capital appreciation.
— The investment trust or its manager is able to arrange for regular savings plans, usually administered by a bank, with shares registered in the name of a nominee. Promotion of investment trust shares through advertising to the public is not permitted under the FSA, but advertising of packaged products is permitted. However, intermediaries are now able to recommend investment trust shares.

2.1.3 *Personal Equity Plans*

2.1.3.1 Personal Equity Plans (PEPs) are schemes which allow individuals to invest in shares, unit trusts and certain bonds free of income and capital gains tax. The investor is the beneficial owner of the assets, although they will be registered in the name of the investor or the manager or a nominee of the manager. There are restrictions on the nature and amount of investments which can be made.

2.1.3.2 PEPs are defined under the Personal Equity Plan Regulations 1989 and various amending regulations. The Inland Revenue has a detailed guide (*PEPs — Plan Manager's Handbook*). Currently, an individual can invest a maximum of £6,000 p.a. in general PEPs. The range of qualifying investments includes United Kingdom (quoted) ordinary shares, qualifying (listed) European Union shares, U.K. corporate bonds and convertibles, U.K. and E.U. preference

shares and, to the extent that at least 50% of the fund is invested in securities which would be qualifying investments in their own right, unit trusts and investment trusts. Of the £6,000 p.a. limit, up to one quarter can be invested in non-qualifying investments, such as emerging markets or gilt funds, without forgoing tax benefits.

2.1.3.3 In addition to the £6,000 p.a. that may be invested in a general PEP, up to £3,000 p.a. can be invested in a single company PEP. As its name suggests, a single company PEP can hold the shares of just one company. Qualifying investments include U.K. ordinary shares (but not investment trusts), qualifying E.U. shares and shares which emerge from approved all-employee savings related share option or profit sharing schemes.

2.1.3.4 PEPs may be either discretionary or non-discretionary. In particular, under discretionary arrangements, the manager is free to make day-to-day decisions on what to buy or sell within guidelines agreed by the client.

2.1.3.5 A PEP is an investment management agreement, and therefore the manager can vary charges, in accordance with the terms of the contract between itself and the planholder.

2.1.4 *Open-Ended Investment Companies (OEICs)*

2.1.4.1 OEICs are, to some extent, a hybrid of unit trusts and investment trusts. They are currently the subject of SIB and Treasury consultative papers, and their introduction is likely in 1996. Some of the details remain to be decided, but an OEIC will be structured as a company and will trade at a price based on the value of the underlying assets. The advantages of OEICs relative to unit trusts are thought to be simplicity and flexibility:

— OEICs will have only a single mid-market price (like European SICAVs). This is arguably simpler for the shareholder to understand and the company to market. There are proposals to protect investors from the risk of dilution caused by large deals.
— Charging structures will be more flexible, and, for example, performance fees may be introduced.
— Differential pricing will be possible, through the introduction of different classes of shareholders within a fund. This may lead to different charging structures for different distribution channels (e.g. initial charge for independent financial advisers (IFAs), no initial charge for direct sales).
— As there is no trust deed to be prepared, submitted and approved by SIB, it may be easier to establish an OEIC, although there will still be a requirement for an instrument of incorporation and a prospectus.
— It will be possible to create new products, such as umbrella funds and capital guaranteed funds.
— It may make selling into international markets easier. The November 1993 budget provided U.K. funds with the ability to pay gross distributions to non U.K. residents.

2.1.4.2 In practice, the introduction of OEICs is expected to provide a boost to collective investment in the U.K., and a number of unit trusts are expected to convert to OEICs.

2.2 *Products and Operating Environment*

2.2.1 *Products*

2.2.1.1 One of the early aims of unit trusts was to simplify investment choice, yet at the end of 1994 the prospective investor faced a bewildering array of 1,559 funds in 22 defined sectors offered by 162 management groups.

2.2.1.2 Despite the similarity between unit trusts and unit-linked life assurance products, the retail unit trust industry is dominated by specialist unit trust companies, distributing predominantly through IFAs and through direct response advertising.

2.2.1.3 Given the favourable tax treatment, many unit trust sales are in the form of PEPs. The growing importance of PEPs to the unit trust industry can be seen from the following comparison of gross sales in recent years.

Year ended 31 December	Unit trust PEPs £billions	Total unit trusts £billions	Proportion of PEPs to total
1991	0.8	10.5	7%
1992	1.3	9.6	14%
1993	3.3	18.7	18%
1994	4.6	19.7	23%
First half of 1995	2.0	8.3	24%

Source: AUTIF

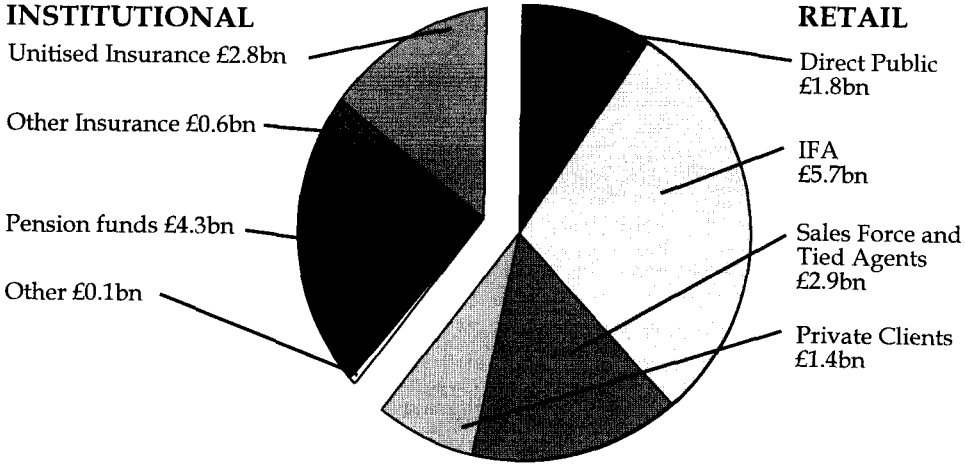
The total value of unit trust funds at 31 July 1995 was £102.7bn.

2.2.1.4 There has been a relatively low level of sales of regular monthly payment plans.

2.2.1.5 In the past 'institutional sales' made up a significant proportion of total industry sales. Often the investment would come from an associated operation, for example a connected life company or pension fund management arm. Gross sales of unit trusts in 1994 by source are shown in Figure 1.

2.2.1.6 Investment in unit trusts by life insurance companies enjoyed the advantage that realised capital gains in individual investments were tax sheltered until the disposal of the actual units. Between 1991 and 1994 many life assurance companies disposed of their unit trust holdings in favour of direct equity investment. This was as a result of changes to life assurance taxation rules, which, for a time, treated unit trust distributions as 'unfranked', and secondly brought in the concept of annual 'deemed disposals' of unit trust holdings to establish gains. These gains were spread forward, typically over 7 years, in computing the tax liability. Whether it is still advantageous to hold units depends on the individual circumstances of the life office.

2.2.1.7 In the last few years there has been considerable product innovation. A few examples are cash funds, corporate bond PEPs, PEP mortgages, unit trust pensions and 'guaranteed' high income PEPs.



Source: AUTIF

Figure 1.

2.2.2 *Operating environment*

2.2.2.1 There is no 'typical' unit trust customer, although sales through IFAs tend to be to wealthier individuals with correspondingly higher average contributions than sales through direct sales forces. The average age of a unit trust investor is in the range of 50 to 60; sales through regular monthly direct debit schemes tend to be to younger investors.

2.2.2.2 The overall market is one in which investors are influenced by the obvious taxation benefits of PEPs, with activity usually concentrated towards the end of the tax year.

2.2.2.3 Unfortunately, for both plan managers and investors, sales levels often peak at times of high market levels, with increasing redemptions when the market is falling.

2.2.2.4 In the IFA sector of the unit trust market, the recommendation of a particular investment is heavily influenced by the perceived investment abilities of the managers. This, in turn, is dependent upon their record of past performance. Similarly, although past performance is quoted as being no guide to the future, direct response advertising relies upon being able to quote good positions in performance tables.

2.2.2.5 This focus on performance has probably contributed to the large number of individual unit trusts available, as a larger number of trusts increases the chance of a manager having a top performing trust in a sector. However, there

is a move in the industry towards consolidation, the main barrier to this being the uncertainty over whether stamp duty is payable or not.

2.2.2.6 Launches of new funds have, from time to time, been instrumental in generating interest in unit trust investment, and have probably benefited sales of other funds as well. There is a risk that a too high profile launch could prove expensive if market conditions suddenly turn adverse.

2.2.2.7 Unit trusts have to compete with other more specialist investments such as investment trusts and offshore equity-based funds in the IFA market, although their relative simplicity and clearer charging structure make them particularly attractive for direct marketing.

2.2.2.8 A feature of the unit trust market is increasing competition on charges. Some companies have moved to a 'back-end' loaded charging structure, with no effective initial charge if the funds are held, for example, for five years. In practice, the relative attractiveness of different charging structures depends upon the period over which the customer intends to hold the units.

2.2.2.9 Maximum levels of commission on unit trust products tend to vary between 3% and 4%, although some brokers will offer discounts by rebating commission.

2.2.2.10 For corporate bond PEPs, an issue arises in relation to the calculation of yields for use in marketing material. Clearly the running yield would overstate the expected return if the majority of assets were standing above their redemption value and there is a potential for capital erosion. The Association of Unit Trusts and Investment Funds (AUTIF) published a draft standard for calculating yields in May 1995, recommending the use of a gross redemption yield basis. The practice of charging costs to capital rather than income should have no effect on the redemption yield, although it will improve the quoted running yield on a fund, when compared with the alternative of charging costs to income. This is a relatively complex area, with issues similar to policyholders' 'reasonable expectation' considerations associated with life assurance contracts.

2.2.2.11 It is intended to introduce a new disclosure regime for unit trusts in 1996. The new regime will be similar to that introduced for life assurance business at the beginning of 1995. There are, however, some differences. For example, it will not be necessary for unit trust key features documents to contain projections. The disclosure proposals, which are set out in PIA's Consultative Paper 8, also seek to take into account differences in the way unit trusts are distributed compared with life products. The new disclosure regime will also apply to the sale of U.K. OEICs and investment trusts.

2.3 *Taxation of Collective Investment Schemes*

2.3.1 *Overview*

Generally, although collective vehicles fall under the corporation tax net, the aim is for tax neutrality relative to direct investment. For authorised or approved vehicles, the rate of tax suffered on income received is set equal to the corresponding rates on direct investments, and investors receive a tax credit so as to avoid double

taxation. Distortions arise, for example, where trusts invest in a mix of asset categories. Capital gains on asset disposals by a unit trust are exempt from tax, but the investor is subject to personal tax on capital gains when he ultimately sells his units. There are many similarities in the ways in which the various types of collective investment scheme are taxed, but also some considerable differences. The tax regime has implications for the scheme itself, for investors and for the manager of the scheme. Each of these is considered in turn.

2.3.2 *Taxation of income within the scheme*

2.3.2.1 A unit trust is categorised as a Dividend Trust if less than 60% of its assets are invested in cash and fixed-interest investments. Otherwise it is categorised as an Interest Trust. Dividend trusts pay corporation tax at 20% on any unfranked income in excess of management expenses and interest paid. Interest trusts are assessed to tax at 25% on their taxable profits.

2.3.2.2 If expenditure exceeds income, tax credits on U.K. equity dividends of a unit trust may be recovered (but not otherwise). Advance Corporation Tax (ACT) paid may be set against the main tax liability, but tax deducted overseas may not, unless it is covered by the terms of a double taxation agreement.

2.3.2.3 Some unit trusts make a Foreign Income Dividend Distribution (see Section 2.3.5). Assuming this is funded from foreign income, it may be set against ACT paid within the trust. This reduces the likelihood of the trust having irrecoverable ACT.

2.3.2.4 Unauthorised unit trusts pay income tax at the basic rate on their income receipts. They receive relief for qualifying interest paid and capital allowances, but not for expenses.

2.3.2.5 For investment companies, franked income and foreign income dividends are treated in precisely the same way as in unit trusts. However, corporation tax is levied at 33% on the excess of any unfranked income over expenses, after deduction of interest payments and investment management fees. Investment trusts are, therefore, taxed on income received in exactly the same way as any U.K. limited company.

2.3.2.6 It is proposed that OEICs will pay corporation tax at 20% on income, or 25% if invested mainly in interest-bearing assets, similar to authorised unit trusts.

2.3.3 *Taxation of capital gains within the scheme*

2.3.3.1 Authorised unit trusts are exempt from capital gains tax when trading in securities, including exemption on exchange gains and losses of a capital nature and gains on transactions in futures and options. It is proposed that OEICs will also be exempt from capital gains tax. The trustees of unauthorised unit trusts are liable to tax on capital gains.

2.3.3.2 Investment trusts are treated in the same way as authorised unit trusts as regards capital gains. However, separate rules apply to investment companies which are not approved trusts for tax purposes, and to investment dealing companies.

2.3.4 *VAT and stamp duty*

2.3.4.1 Within unit trusts, VAT is raised on trustee's, auditor's and registrar's fees, but not on the investment management fee itself. We understand that these exemptions are also likely to apply to OEICs.

2.3.4.2 With regard to PEPs, the initial and annual charges on a single company PEP are subject to VAT. Where the PEP invests in a unit trust, only the excess charges over the normal unit trust charges are potentially subject to VAT, but the rules are complex.

2.3.4.3 Stamp duty must be paid on the purchase of securities such as shares within the fund. Stamp duty is also payable on the units themselves if they are transferred from one beneficial owner to another (see ¶2.3.6.3).

2.3.5 *Treatment of distributions to investors*

2.3.5.1 In a dividend unit trust, the total distribution is divided between the ordinary dividend distribution and the foreign income dividend distribution (if appropriate). At the first distribution following purchase, the new unit holder receives a total distribution equal to accrued income from the date of purchase plus an 'equalisation' adjustment representing a capital repayment of accrued income included in the purchase price.

2.3.5.2 The recipient of a dividend distribution also receives a tax credit of 20%. This may be reclaimed by pension funds and other non-taxpayers. Basic and lower rate taxpayers are deemed to have paid the correct amount of tax, so no additional liability or reclamation arises. Higher rate taxpayers must account for further tax of 20%.

2.3.5.3 The situation for a foreign income dividend distribution is similar, although non-taxpayers may not make a reclamation. As mentioned earlier, a main purpose of these distributions is to reduce the trust's overall ACT liability.

2.3.5.4 Some trusts offer a facility to automatically reinvest income. There is still deemed to be a dividend distribution for tax purposes, however, and the part of the unit's appreciation attributable to this rather than to capital gain is assessed to income tax.

2.3.5.5 For corporate holders, part of each distribution may be treated as franked income, and comes with a tax credit. The rest of the distribution is deemed to have had income tax deducted at the lower rate, and is assessable to corporation tax. Exceptions to this are unit trust management companies and investment trusts which only hold authorised unit trusts. These companies may treat all the dividend distribution as franked income.

2.3.5.6 Interest trusts make annual interest distributions, with income tax deducted at 25%. Investors are liable for any excess of their marginal rate over 25%.

2.3.5.7 The holder of an unauthorised unit trust is assessed to capital gains tax on any capital appreciation of the trust, even if the underlying investment is exempt from capital gains tax. If an unauthorised trust has less than 10% of its investments in 'qualifying assets', then gains may not be offset against changes in the Retail

Price Index (indexation relief) when working out the capital gains tax liability. Qualifying assets include cash, gilts and certain corporate bonds.

2.3.5.8 In PEPs, dividends are tax free, with any tax previously deducted at source at the basic or lower rates automatically reclaimed. No liability to basic or higher rate tax arises for the investor. No capital gains tax arises either within a PEP or on disposal.

2.3.5.9 Some collective investment vehicles provide exemption from income tax and capital gains, although tax may still need to be reclaimed. All investors in such schemes must prove to the manager that they are eligible to hold units.

2.3.6 *Taxation of the manager*

2.3.6.1 A unit trust manager pays corporation tax on his profits. As stated in ¶2.3.5.5, all dividends received are treated as franked income. Franked income from this, or any other, source is not taxed, and tax credits may not be reclaimed.

2.3.6.2 The manager pays corporation tax on chargeable gains, usually after offsetting indexation relief.

2.3.6.3 Where units are 'revolved', that is redeemed by one investor and sold on to another investor by the unit trust manager, stamp duty is payable.

2.4 *Use of Derivatives*

2.4.1 *Introduction*

Although the purchase of derivatives by unit trust managers has, to date, been very limited, their use within collective investment schemes, and particularly within unit trusts, merits special consideration.

2.4.2 *The regulatory environment*

2.4.2.1 The 1991 regulations cover the use of derivatives by unit trusts. The regulations cover investment policy, but, in contrast to the life industry, there are no restrictions equivalent to the admissibility limits which would have the effect of limiting the proportions of total assets which are held as derivatives.

2.4.2.2 The main rule set out by SIB for making use of derivatives is that of Efficient Portfolio Management (EPM). Prior to the 1991 regulations, hedging transactions were permitted for up to 10% of the value of the fund. This limit has been removed. Instead there are three, more broadly based, requirements under the heading of EPM. These are:

— the transaction must be economically appropriate, that is speculative transactions are excluded;
— the exposure must be fully covered, that is, the scheme must hold investments which are of the right kind and sufficient in value or amount to match the exposure which exists, or which may arise, as a result of the derivative; and
— the transaction must be entered into for one or more of the three specific aims of reducing risk, reducing cost or generating additional capital or income for the scheme with no, or an acceptably low, level of risk.

2.4.2.3 In addition to the above rules, some authorised unit trusts can be

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invested in derivatives, not simply by way of EPM, but as part of the general investment management policy applicable to the scheme. Unit trust managers can offer Futures and Options Funds (FOFs) and Geared Futures and Options Funds (GFOFs). FOFs can invest in derivatives, as long as the exposure itself is suitably covered. Some limited investment without cover is permitted, in the form of purchased options. GFOFs, on the other hand, are permitted to invest and retain 20% of their investments in derivatives. For both types of funds there are detailed rules regarding the types and limits of investments that can be held.

2.4.2.4 The above rules are applicable to on-shore unit trusts. The regulations applicable to off-shore unit trusts are different, but, in general, allow a greater extent of gearing through the use of derivatives.

2.4.3 *Practical applications*

2.4.3.1 Tactical asset allocation may be implemented through the use of derivatives rather than through the sale and purchase of underlying property, fulfilling aims of reduction of risk or reduction of cost. Another example application is for index tracker funds, which try to match the investments of an index such as the All-Share Index. The income flow by way of dividends, etc., can be reinvested to track the index, by using derivatives.

2.4.3.2 Similarly, derivatives may be used to switch currency exposure away from a currency which the manager considers to be unduly prone to risk.

2.4.3.3 The possibility of introducing limited issue and limited redemption funds has recently been discussed although an amendment to SIB Rule 4.15 — to allow a manager to close its door to new investment and to restrict the issue of new units — would be required. Limited issue funds would have a finite launch period, during which they would accept investments. They may also have a time limit on redemption. This could allow the manager to offer some form of guaranteed return or capital growth for those investors who remain invested for a set period of time, say five years. The guarantee could be achieved by using derivatives. A single tranche fixed-term or a regular period roll-over guarantee could be provided. The popularity of life assurance on guaranteed equity products provided an impetus for life companies to increase their use of derivatives.

2.4.3.4 In Section 3.3 we discuss the embedded value of a unit trust. One potential use of derivatives would be to smooth the future growth of the fund, and, therefore, smooth the pattern of future income from fund management charges. This, in turn, would assist with the management of the embedded value of the scheme, although care would need to be taken that any such use complied with the objectives of the trust.

2.4.3.5 The relatively limited use of derivatives by unit trusts can be gleaned from the information from AUTIF on FOFs and GFOFs. In April 1995 there were five fund managers offering between them thirty-five FOFs with funds under management of approximately £160m, and one fund manager offering a GFOF with funds under management of approximately £5m.

2.4.4 *Financial analysis and control*

2.4.4.1 In general, the use of derivatives within the rules laid down must be, or at least must be perceived to be, beneficial to the investment performance, either in terms of the overall level of return or the security of the return. Taxation of derivatives within unit trust schemes complicates the analysis.

2.4.4.2 When using derivatives, a cost-benefit analysis is required. Clear objectives must be set, and analysis undertaken, showing how these are to be fulfilled using derivatives.

2.4.4.3 The controls need to demonstrate that the investment regulations are being met. Exposure needs to be measured and controlled. Cover and credit risk, similarly, need to be monitored and controlled.

2.5 *Unit Trust Pricing Regulations*

2.5.1 *Introduction*

Unlike the units in an internal fund of a life assurance company, which are notional, and whose main function may be to provide a convenient method of accounting and of determining policyholders' benefits, the units in a unit trust are real. In broad terms, the valuation of units in a unit trust is achieved by valuing the assets in the trust, and dividing that value by the number of units in existence. Units come into existence when they are created by the trustee acting on the instructions of the manager. The manager must then pay to the trustee money (or other assets) for them. Units are then issued, to any person who applies, by the manager at a price (the offer price) fixed by him inside the price bracket derived from the regulations. Alternatively, units may be sold to such a person by the manager acting as agent for the trustee. Managers often hold units for their own account (in the 'box'), so that a purchaser of units may receive units that have just been created or units that have previously been issued (and have been redeemed by the manager from a previous unit holder). If an owner of units wishes to realise them by dealing with the manager, the manager will redeem them at a price (the bid price) inside the bracket derived from the regulations. The manager may then decide either to hold the units in his box or else to instruct the trustee to cancel them. Alternatively, the owner may request the manager to buy the units from him as agent for the trustee.

2.5.2 *Creation, issue, redemption and cancellation*

2.5.2.1 Each of the four stages of creation, issue, redemption and cancellation are covered by the 1991 regulations, which set out how to calculate the price at which units are created within a unit trust (the creation price), the price at which units are cancelled (the cancellation price) and the price bracket within which the bid and offer prices are calculated.

2.5.2.2 The creation and cancellation prices are those at which the managers deal with the unit trust, that is with the trustee. This compares with the offer and bid prices, which are those at which the managers deal with the public. The maximum permitted offer price is referred to as the maximum issue price and the minimum permitted bid price is referred to as the minimum redemption price.

2.5.3 *Method of calculation*

2.5.3.1 Unit prices are based on the actual value of the securities and cash in the trust fund, adjusted for charges. To determine the creation price, the managers must take the value of the underlying securities at market dealing offer prices at the relevant valuation point, and add in the dealing costs together with the other assets of the trust, such as uninvested cash and accrued income. Finally, an adjustment is made for any tax liabilities and accrued management charges. This total is then divided by the number of units in issue. The price is then rounded to four significant figures. The maximum issue price is the creation price plus the managers' initial charge.

2.5.3.2 The minimum redemption price must not be less than the cancellation price. The cancellation price must be calculated as the value of the underlying securities at market dealing bid prices, less dealing costs, plus income, etc. The total is adjusted for any tax liabilities and accrued management charges, and is then divided by the number of units in issue.

2.5.3.3 In determining creation and cancellation prices, an overriding principle is that, when the managers deal with the fund as agents for the incoming or outgoing unit holders, the interests of the existing unit holders should not be affected. In the case where there are more buyers of units than sellers, and units are being created, the price of the fund will be unaffected by the creation of the additional units only if the new money is used to purchase an identical spread of assets to those already in the fund. It follows that the creation price must be calculated by valuing the portfolio on an offer price basis, adding the cost of buying the identical portfolio and then dividing by the number of units in issue. If there are more sellers than buyers, and units are being liquidated, the cancellation price must be calculated by valuing the portfolio on the bid price basis, deducting the costs that would be involved in realising the investments, and dividing by the number of units in issue.

2.5.3.4 Although straightforward in principle, the calculation of unit prices can become quite complex in practice. There have been a number of papers written on this subject to which the reader is referred for further details, for example Laker & Squires (1985).

2.5.4 *Forward and historic dealing*

2.5.4.1 Under the 1991 regulations, a unit trust may be priced for dealing on either a forward or a historic basis.

2.5.4.2 Dealing at a forward price means that all transactions will be dealt with at the price calculated the next time the fund is valued. Dealing forward can be perceived to be fairer than dealing at historic prices. The disadvantage is a commercial one, in that investors like to deal at known prices.

2.5.4.3 For this reason many groups still deal at historic prices, that is they deal at prices calculated at the last valuation point. Dealing on a historic basis carries greater risks for the unit trust manager than dealing forward. To reduce these risks, there are circumstances in which a manager who is dealing on an historic basis must or, in some cases, may change to forward dealing, namely:

— If the unit trust manager has reason to believe that the unit price has changed by more than 2%, he must either move to a forward price for all transactions (including creating units for himself) or must reprice. After repricing, he can continue to deal historically at that price (as well as creating units for himself within the next two hours).
— For large deals (currently defined as anything over £15,000), the unit trust manager can insist on dealing forward.
— The unit trust manager can refuse to deal historically for any small deal (i.e. less than £15,000), but must then deal forward for all subsequent transactions within that fund until the next valuation point.

2.5.5 *Single pricing*

2.5.5.1 It has been suggested that the current system of dual pricing (the calculation of different prices for buying and selling) for unit trusts should be replaced by a system of single pricing. All transactions would then take place at that single price, and purchasers would pay an explicit charge for their units. One clear possibility would be the same pricing mechanism as that currently envisaged for OEICs, referred to in Section 2.1.4.

2.5.5.2 The advantages of such an approach are that it would make the pricing of unit trusts easier for the public to understand and, consequently, make them more marketable. This is of particular importance for funds authorised for sale in continental Europe, where dual pricing is unknown. The disadvantage is that creating and cancelling units at the 'wrong' price will damage the long-term performance of the fund, although the proposals for OEICs contain measures to avoid substantial dilution. Those benefiting from single pricing will typically be short-term unit holders, whilst those suffering will often be long-term holders. However, this will depend on a number of factors, for example whether the fund is growing or contracting. The effects of this are relatively small, and the view now generally held within the U.K. is that the advantages of single pricing outweigh the disadvantages, particularly given that single pricing has worked for many years, both in the United States of America and in Europe.

2.6 *Unit Trust Charges*

2.6.1 Before 1979 the charges which could be made by managers were limited to a total of 13.25% over 20 years. For example, if the initial charge was 3.25%, the maximum annual charge was 0.5%. Where the initial charge was 5%, the DTI would not authorise a unit trust with an annual charge in excess of 0.375%. This gave a total charge over the first 20 years of 12.5%, a little less than the permitted maximum of 13.25%.

2.6.2 In addition to the annual charges described above, the managers were also entitled to take the 'roundings'. The rounding was not allowed to exceed 1% or 1.25p, whichever was the lower. Roundings at this level constituted a charge. Where the manager did not take the rounding he was entitled to an additional initial charge of 0.5%. We are not aware of any cases where this alternative charging

structure was adopted, and, indeed, one company we know of kept neither the rounding nor the additional initial charge. Roundings are not now permitted.

2.6.3 Charges are no longer controlled, but the trust deed must state the charges which the managers propose to make at outset, and also give the maximum to which the managers can increase the charges without going back to unit holders to approve the increase. Unit trust charges today are typically 5% initial and 1% to 1.5% annually, although some annual charges are as high as 2.5% or as low as 0.5%.

2.6.4 Registrar's fees and trustees' fees may also now be charged to the fund (and usually are). Until a few years ago the managers had to meet these fees from their own annual charge. The fees can either be charged directly to the fund or expressed as a percentage of the fund, with the managers taking any profits (or losses) if the percentage charge exceeds (or falls below) the fees.

2.6.5 Although the statutory limit on the amount of charges that can be levied no longer applies, restrictions remain on the types of charge that can be made. Until very recently the only permitted charges were an initial charge (expressed as a percentage of the investment) and an annual charge (expressed as a percentage of funds under management). However, charging structures are now becoming more complex. With the introduction of PEPs, it became possible to charge a flat administration fee on top of the initial and annual management charge. SIB has also recently amended its regulations, and unit trusts are now able to make exit charges and, for geared futures and options funds, charge performance related fees.

3. FINANCIAL MANAGEMENT

3.1 *Data Investigations and Statistical Analyses*

3.1.1 *Introduction*

The financial management of a unit trust company requires many of the same investigations and analyses as that for a life company, to ensure a full understanding of the business and the management of its risks.

3.1.2 *Realistic analysis of experience*

3.1.2.1 A proper analysis of the experience of the company is required to:

— understand the sources of income and expenditure;
— focus management attention on the important drivers of profit and loss;
— provide the information necessary to enable benchmarking, monitoring and improving performance in each area;
— identify and control the risks inherent in the business;
— ensure the agreed profit criteria are met in respect of the pricing of new business; and
— direct the sales and marketing efforts to the areas where profits can be maximised.

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3.1.2.2 The mid 1980s saw booming stock markets and an investing public whose risk aversion to equities underwent a re-appraisal with each successful privatisation issue. Fund management groups competed on investment performance and distribution rather than on price. Sales through IFAs and direct marketing, in particular mailings to bought-in shareholder lists, were achieved at a cost less than the initial charge, thereby generating profits at the point of sale. Provided that other costs could be contained below the annual fund charge, successful companies saw rapid growth in profits, and there appeared little need for traditional actuarial skills, as applied in the management of life companies.

3.1.2.3 Even in the times of prosperity prior to the Stock Market crash of October 1987, it was possible to find areas where profits could have been enhanced or potential losses could have been recognised, for example:

— Sales through adverts or mailing lists were typically measured by the response at that time, with marketing costs expressed as a percentage of new investment sums attracted. An analysis of the lifetime value of a new customer, by way of increased future sales, could have justified the continuation of a promotional campaign which would otherwise have been terminated by virtue of the response falling below the apparent break-even point.
— Savings plans were marketed as a vehicle for regular contributions. They were characterised by the low level of contributions required, sometimes as little as £20 a month, but a lack of any contractual obligation on the part of the plan-holder to continue such payments. Management groups came to regard these small plans as loss leaders, which would, nevertheless, contribute to overheads and expand the client base. However, the poor persistency of subsequent contributions and relatively high running costs make it unlikely that the rationale for promoting these plans would have been supported by a detailed profitability analysis.

3.1.2.4 It is easy to be wise with the benefit of hindsight, but these examples serve to demonstrate that the analysis of experience lies at the core of managing profitability.

3.1.3 *Analyses to be undertaken*

3.1.3.1 The primary analyses will be those to provide the information required to price the company's products. Whilst the pricing exercise takes a prospective view of each component, the starting point should be the current experience and recent trends of the company, and that of peer groups within the industry.

3.1.3.2 The information required for pricing will include data on:

— the annual charge on the fund and any other charges accruing to the managers, e.g. in respect of registrar's fees;
— the anticipated bid offer spread;
— the managers' initial charge;
— the projected investment return on the underlying assets;
— the effect of unit holders taking income payments;
— redemption rates, including redemptions arising on the death of the unit holder;

— the profile of anticipated future contributions to the in-force plans;
— expenses, including commission; and
— the projected rate of expense inflation.

3.1.3.3 The key economic elements are the investment return (subject to tax as appropriate) and the rate of expense inflation. The values of the assumptions relative to each other are often as important as their absolute values. It follows that the assumptions must be consistent with one another and also with the shareholders' risk rate of return.

3.1.3.4 An area which is particularly complex is the analysis of the expenses. The expenses should be divided between the initial cost of sales, marketing and head office administration costs, and the renewal costs of keeping a plan in force.

3.1.3.5 The form that the analysis takes should be consistent with the way in which the company is structured. For example, expenses may be grouped by department, in a company in which management control is based on dividing the company into a number of separate profit centres. More detailed information and analysis may be able to provide a further breakdown of expenses into the cost of each activity. This will enable the company to examine the expenses associated with specific products, for example the cost of income payments to unit holders or the cost of reclaiming and reinvesting tax reclaims on PEPs.

3.1.3.6 The analyses should be sufficiently detailed to bring out the differences in experience between different products and methods of distribution, for example:
— unit trusts, investment trusts and PEPs;
— income or accumulation unit holdings within unit trusts;
— type of investment fund, e.g. U.K. equities, corporate bonds, and overseas equities; and
— IFA, direct mail and direct sales force distribution channels.

3.1.3.7 An investigation of the sensitivity of profitability to variations in assumptions will highlight those factors which are important, and to which management attention should be drawn.

3.1.3.8 The information derived from analysing patterns of customer behaviour in such areas as:
— sums invested;
— rates of repurchase;
— the preference for capital or income; and
— the propensity to make repeat investments;

subdivided, for example, by:
— age;
— sex; and
— socio-economic group;

can also be used to assist marketing divisions with segmenting their customer communications, and should lead to a greater understanding of the lifetime value

to the company of new and existing customers.

3.1.3.9 There is also a need for work to be carried out to analyse in detail the risk profile of different types of unit trust or investment trust. The information could be used to match different trusts to customers' risk preferences and, in particular, will aid comparisons with guaranteed and fixed-interest products, such as the new corporate bond PEPs.

3.1.3.10 In today's complex and competitive markets, the ability to generate, analyse and interpret management information is vital to the successful management of any company, as those who are better informed are more able to take advantage of the opportunities available. Investment companies are no exception.

3.2 *Box Management*

3.2.1 *Introduction*

The difference between the total unit holder liability for a fund and the actual units created is known as the manager's box. Box management is the process whereby managers hold units for their own account, and set prices having regard to their profit or other objectives, subject, of course, to the important regulatory and other constraints.

3.2.2 *Pricing*

3.2.2.1 As noted in Section 2, the regulations specify the calculation of maximum and minimum prices. The maximum permitted spread between the offer price and the bid price can be up to 10% or more (depending on the bid offer spread on the underlying assets) and the managers are, in theory, free to maintain such a spread if they wish. In practice, however, commercial pressures have resulted in significantly lower quoted spreads.

3.2.2.2 The manager will make a margin equal to the whole of the bid offer spread, provided he can match buyers and sellers. If sales have exceeded repurchases, the manager will need to create a number of units to make up the difference, and will deal with the fund at the creation price. In respect of the new units created, the manager will make a margin equal to the difference between the offer and creation prices. If the offer price is equal to the maximum issue price, this will be equal to the initial charge less roundings. The commercial pressure referred to above is that the margin made by the managers on 'revolved' units should not significantly exceed the amount which the managers make when creating units. For this reason, the spread on units is typically in the region of 6% - 6½% (5% initial charge plus ½% stamp duty plus an additional ½% - 1% margin).

3.2.2.3 Given that, commercially, the bid offer spread has to be a maximum of about 6% or so, a further problem which the managers face is deciding where, within the overall permitted range, they should fix the quoted prices, bearing in mind that they will have to attempt to match buyers and sellers if they are not to continually change the price basis from offer to bid.

3.2.2.4 If a fund is, in general, expanding, and the managers are quoting an offer price equal to the issue price and a bid price about 6% less than this, new unit

holders are paying the maximum for their units, but any unit holder going out of the fund is receiving substantially in excess of the cancellation price. In this situation, the whole of the continuation profit (the benefit of the manager's ability to match buyers and sellers) accrues to the outgoing unit holders. Conversely, if the fund is contracting and the managers are quoting a bid price equal to the minimum redemption price and an offer price around 6% higher than this, the outgoing unit holders are receiving their minimum permitted entitlement, but new unit holders are being given the opportunity to buy units at substantially less than the maximum issue price. In this case, the whole of the continuation profit is accruing to the new unit holders.

3.2.2.5 In view of the fact that all of the continuation profits accrue to a particular class of unit holder, there is a strong theoretical justification for managers to quote bid and offer prices, not at the top of the permitted range or at the bottom, but somewhere in the middle. The continuation profits could then be shared between the incoming and outgoing unit holders. If, however, the managers were to quote their bid and offer prices somewhere in the middle of the permitted range, they would either have to widen their spread if their margin was not to be eroded, or penalise particular classes of unit holder. This is illustrated in Table 3.1.

3.2.2.6 Suppose, for simplicity, that the bid offer spread is exactly equal to the initial charge (ignoring expenses and roundings) and assume, also, that the fund is expanding. Column 1 demonstrates that, if the offer price is equal to the maximum issue price, the managers make 5% of the amount subscribed, that is the whole of the initial charge. Column 2 illustrates the position where the bid offer spread remains at 5%, but the quoted bid and offer prices have been reduced. It can be seen that, although the managers are fully entitled to quote on this basis if they wish, the effect of doing so is that their margin will be eroded. Column 3 goes on to show that the managers can reduce the quoted bid and offer prices and maintain their margin, provided they widen the spread.

Table 3.1. Managers' margin

	Offer price equals issue price	Offer price less than issue price	Bid/offer spread increases
Issue price	1.05	1.05	1.05
Offer price (O)	1.05	1.04	1.04
Creation price (C)	1.00	1.00	1.00
Bid price (B)	1.00	0.99	0.98
Sales (S)	1,000	1,000	1,000
Repurchases (R)	600	600	600
S–R	400	400	400
Margin to managers (S–R) x (O–C) + R x (O–B)	50	46	52

3.2.2.7 However, as discussed above, commercial pressures often do not allow the managers to widen their spreads in this way, and it is, therefore, almost univer-

sal practice for managers to quote prices either at the top or at the bottom of the permitted range.

3.2.3 *Unit management*

3.2.3.1 The larger the manager's box the greater the mismatch, and the greater the potential for additional profits or losses to the manager. The existence of a box can also lower transaction costs and, therefore, act as a benefit to both unit holders and managers. The box can be actively managed to attempt to make a real extra profit or can be managed in a neutral, defensive way, with the aim of avoiding loss. The former strategy requires capital and skilful investment management. In the latter case, one is trying to manage short-term demand, which otherwise would require units to be cancelled only to be later recreated. Experience will help, but monitoring the pattern of demand may allow closer management. Management will also need to take account of the situation where one fund invests in another fund. It has also to be borne in mind that, in a changing market, the loss incurred from a market movement in an unmatched position may often be greater than the cost of cancellation and recreation of units.

3.2.3.2 In practice, box management could be a large source of profit in the past, but tighter rules have significantly reduced the scope for this.

3.3 *Management Control and Profit Reporting*

3.3.1 *Introduction*

Understanding of the business and control of its risks will be enhanced by the provision of regular, timely, accurate and appropriate information. The converse is also true. The method of calculating 'profit' also needs to be pertinent to the needs of the business.

3.3.2 *Management control*

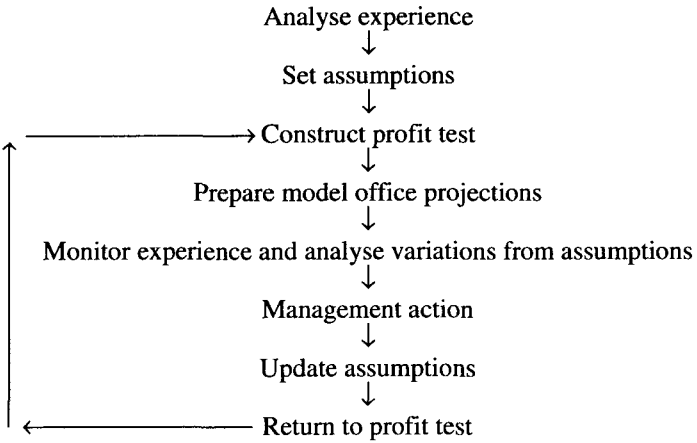
3.3.2.1 There is no single schedule of reporting that can be appropriate in all circumstances. However, the following reports on a monthly basis represent a good framework for management information:

— management accounts, including information on expenses, headcount and results from each internal profit centre;
— sales and repurchases by major product line and distribution channel;
— margins on sales and other activities;
— the size of the manager's box of units;
— investment performance of the unit funds over suitable time periods, measured both against indices and peer groups;
— investment performance of shareholder funds;
— cash flow forecasts;
— embedded value profit, analysed between value of new business and profit from existing business; and
— control information targets and budgets, as appropriate, provided for comparison.

3.3.2.2 It is also essential that any significant differences between actual and expected experience should be analysed and reported.

3.3.2.3 Exception reports can be used to provide the information required for effective control of risk. The circumstances under which a report will (or will not) be generated must be precisely defined, and the time elapsed before the report is received must reflect the risk involved. A large position taken in the manager's box of units will require immediate consideration, whereas significant redemptions of units by an IFA may be viewed over a period of time. Exception reports can also be particularly useful in reducing information overload.

3.3.2.4 For many purposes, it is instructive to go through the 'Control Cycle':



3.3.3 *Profit reporting*

3.3.3.1 The use of embedded value techniques is well established in life assurance companies, both for internal management reporting and, increasingly, for external reporting at the holding company level, both as a balance sheet item and in the profit and loss account. Embedded value methodology is discussed in Section 3.4 and in later sections of the paper. The Profit Reporting SORP (Achieved Profits Method) for life assurance business will define a common methodology, and could further extend the use of embedded value or related methods.

3.3.3.2 Although specialist unit trust companies may have had little or no experience of embedded value reporting in the past, increasingly unit trusts are being sold in substantial volumes by life companies or companies with life assurance subsidiaries. These organisations are well versed in the use of embedded value reporting for their life businesses, and are likely to see the inclusion of unit trust business in this reporting framework as a natural extension.

3.3.4 *Application of embedded value reporting*

3.3.4.1 It is sometimes argued that there is a fundamental difference between life products and unit trusts, in that unit trusts do not have a defined term or product structure when compared to, say, a regular premium endowment policy or term assurance. This difference is, however, in many ways illusory.

3.3.4.2 There is clearly a considerable similarity between a single premium equity-linked insurance bond and a unit trust, other than in the taxation treatment. Rates of repurchase for both products are also likely to be very similar. Early indications of regular PEP persistency are that it will be similar to that of a life assurance maximum investment plan.

3.3.4.3 Many of the key assumptions needed to calculate embedded values can often be derived from information recorded in a good management information system.

3.3.4.4 For some situations, it may be thought desirable by management to adopt a method of smoothing investment returns to avoid fluctuations in results caused by the volatility of market levels. Smoothing adjustments are sometimes used for life assurance embedded value reporting, although the impact will be greater for unit trusts, given the relatively high reliance on future income from annual management charges.

3.3.5 *Indicative results*

3.3.5.1 This section provides the results of building a simple model of a new unit trust company selling both single investments and a regular monthly payment plan. Projected profits assessed using both conventional and embedded value bases are compared.

3.3.5.2 The following assumptions were made:

— Net unit growth	8.8% p.a.
— Average investment	£10,000 (single)
	£60 per month (regular)
— Encashment rates	15% p.a. (single)
	10% p.a. (regular)
— Paid-up rate (regular)	5% p.a.
— Number of sales (p.a.)	10,000 (single)
	10,000 (regular)
— Initial expenses	5% of contribution (single)
	20% of contribution (regular)
— Renewal costs	£12.50 plus 0.1% of funds p.a. (single)
	£20 plus 0.1% of funds p.a.
	plus 4% of premium (regular)
— Initial charge (bid/offer spread)	5%
— Annual management charge	1.25% p.a.
— Discount rate	12.5% p.a.
— Tax rate	33%
— Expense inflation	5% p.a.

3.3.5.3 The discount rate and economic assumptions used for financial reporting purposes may well differ from those that may be used in assessing value for the purposes of a financial transaction. This is discussed further in ¶3.4.5.1, as is the issue of selecting a discount rate.

3.3.5.4 The following tables compare the projected profits on both conventional and embedded value bases, for the regular payments and the single payments products separately, based on a level profile of new sales each year.

Table 3.2. Profits comparison (regular payments) £m

	Profit in year									
Year	1	2	3	4	5	6	7	8	9	10
Profit basis										
Conventional	(1.00)	(1.03)	(1.02)	(0.98)	(0.92)	(0.83)	(0.72)	(0.59)	(0.46)	(0.31)
Embedded value	0.35	0.49	0.64	0.87	1.00	1.20	1.41	1.63	1.85	2.09

Table 3.3. Profits comparison (single payments) £m

	Profit in year									
Year	1	2	3	4	5	6	7	8	9	10
Profit basis										
Conventional	0.32	0.92	1.47	1.96	2.41	2.82	3.19	3.52	3.82	4.09
Embedded value	3.36	3.69	3.98	4.25	4.49	4.70	4.89	5.06	5.20	5.33

3.3.5.5 These tables demonstrate that the use of embedded value reporting accelerates profits relative to the conventional accounting treatment, with the effect being particularly noticeable for regular payments, where the profit on a conventional basis is still negative after 10 years. The key difference is that, with embedded value reporting, the value derived from sales activity in the year is reported in the year of sale rather than being left to emerge over time.

3.3.5.6 In these examples, the stream of embedded value profits has remained in excess of the conventional profits over the 10-year period. The position would eventually reverse, for example if new business growth slowed or repurchase rates increased significantly.

3.3.6 *Use of embedded values*

3.3.6.1 There is an obvious use for embedded value techniques in internal business planning. Embedded values enable the profitability of different product mixes and different product designs to be compared directly and enable management to formulate consistent strategies.

3.3.6.2 The use of embedded values will assist shareholders and management in understanding the true economic value of their business. It will also highlight the main profit drivers and risks, which are not always apparent if only conventional accounting techniques are used.

3.3.6.3 If embedded value results are made public, there is potential for greater understanding of the business by analysts, lower uncertainty as to company value and underlying profit and a consequent beneficial impact upon share prices.

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3.3.7 *External reporting and future developments*

3.3.7.1 To date no unit trust company group has used embedded value profit for external statutory profit reporting. This leads to a clear inconsistency, since the profitability of life assurance subsidiaries are often reported on an embedded value basis in group accounts.

3.3.7.2 Some unit trust groups use deferred acquisition cost accounting methods to amortise initial expenses over several years. This method is an improvement over the current accounting basis, but does not take account of future conventionally stated profits or losses resulting from renewal expenses or management fee income. The method can also lead to distortions if new business volumes fluctuate significantly from period to period. The period of amortisation is, of necessity, arbitrary, and the method is aimed primarily at removing one distortion resulting from current accounting rather than measuring or reporting underlying profitability.

3.3.7.3 There is no clear view from the major audit firms on the acceptability of embedded value unit trust profit reporting, although using deferred acquisition costs is likely to be acceptable. This can result in the use of two different methods within the same group. It is difficult to justify logically the acceptability of embedded values for life assurance business, but not for unit trust business.

3.3.7.4 The growth of unit trust sales by banking and life assurance groups will lead to wider use of embedded values internally, and to pressure for their use in external reporting. The widespread adoption of embedded value reporting by unit trust companies would be a major advance in providing useful information on performance and value to both shareholders and managers.

3.4 *Appraisal Values and Transaction Prices*

3.4.1 *Introduction*

3.4.1.1 Estimates of the value of an investment management company may be required for a number of reasons, for example to assist management in determining how to maximise shareholder value or to assist in the setting of a price at which the acquisition of an interest in a company takes place.

3.4.1.2 Use of appraisal values is one method of assessing value. The importance of appraisal value methodology is evidenced by its widespread use within the insurance industry. The technique, also known as discounted cash flow valuation, is standard in numerous industries and in project evaluation. It is the ability of this methodology to provide a focus on the key factors influencing the company and its value that is, probably, its biggest asset.

3.4.1.3 In this section we assess how actuarial techniques used in calculating insurance company appraisal values can be applied to investment and fund management companies. In practice, appraisal values of unit trust companies are routinely calculated in the course of life office merger and acquisition work.

3.4.1.4 Business knowledge is the foremost requirement in applying any type of financial analysis, and the use of appraisal value techniques is no exception to this rule.

3.4.2 *Traditional valuation methods*

3.4.2.1 Traditionally, estimates of value have been assessed using one or more of several rules of thumb, as a percentage of funds under management, as a multiple of fee income or by applying a price/earnings (P/E) ratio to after-tax profits. For example, Table 3.4 illustrates the percentage of funds approach to valuation, and also, for comparison, sets out typical fee levels for the four principal fund management categories.

Table 3.4. Rule of thumb valuation of a fund management company

Type of funds under management	Valuation factor %	Typical fee % p.a.
Unit trust	5.0	1.2
Investment trust	2.0	0.4
Pension fund	1.0	0.2
Private client	2.5	0.7

3.4.2.2 The value of a company would be assessed by applying these different valuation factors to the funds under management, and adding in the amount of shareholders' funds. In practice, a wide variety of factors are in use, sometimes applied without adding back the amount of shareholders' funds.

3.4.2.3 The rule of thumb approach can be criticised on a number of grounds. Why is 5.0% the right factor for unit trust funds? What level of profitability does this assume, and how should the factor be varied if profitability differs from this? What adjustments are required for a company with a high level of sales or repurchases?

3.4.2.4 Another traditional tool to value companies has been to apply a P/E ratio to current earnings. In applying the P/E ratio, current earnings may need to be normalised, for example to allow for any non-recurring items.

3.4.2.5 Standardised P/E ratios are often selected for groups of companies or particular sectors of the market. Variations between different groups imply and support the thesis that businesses in different groups are structurally different. Indeed, the same argument is used to support different P/E ratios between different companies within the same sector or industry.

3.4.2.6 However, the use of P/E ratios for valuing life insurance companies has proved to be of doubtful value. This is primarily because, in contrast to most other industries, the sale of insurance gives rise to a stream of cash flows over the life of the products sold, rather than the immediate cash benefit typical in non-financial industries. Statutory reporting results in only part of the cash flow stemming from the sale of a product being recognised at the point of sale, and cash flow patterns vary enormously from product to product. These points apply increasingly for unit trusts.

3.4.2.7 Similar criticisms can be levelled at fee income multiple and other approximate approaches. For these reasons a more scientific approach is desirable.

3.4.3 *Appraisal value techniques*

The approach used by actuaries in the valuation of a life office appears particularly suitable to fund management company valuation. Company valuation is assessed as:

(a) shareholders' funds, adjusted, for example, to allow for non-interest bearing assets; plus
(b) value of profits expected to arise in the future from the existing volume of funds under management (in the case of a life company, this would be the existing portfolio of life policies on the books and is known as the 'embedded value'; the term 'embedded value' is sometimes taken to include adjusted shareholders' funds); plus
(c) value of profits expected to arise in the future from future sales of units, or contracts of fund management expected to be arranged in future years ('goodwill' or 'existing structure' value).

These three components of appraisal value are considered in turn.

3.4.4 *Shareholders' funds*

3.4.4.1 Generally, assets and liabilities will be taken at, or adjusted to, market value. Adjustments may be made in respect of the value of any expenses not taken account of in the main appraisal, for any potential capital gains tax liability and in respect of assets which are expected to yield less than a market rate of return.

3.4.4.2 Another adjustment which may be appropriate is to reflect the value of any tax benefit, or cost, of holding assets within the fund management vehicle compared with the tax treatment of assets held directly. This adjustment recognises that the net return to shareholders arising from income and gains derived from shareholder assets held in the fund management company may differ from the net return to shareholders were such assets held directly by shareholders.

3.4.4.3 Where the appraisal does not pertain to the acquisition or disposal of a controlling interest, it may also be appropriate to apply a discount to shareholders' funds, to reflect any expectation that management will make inefficient use of these assets.

3.4.4.4 In practice, shareholders' funds for most fund management companies are generally fairly small. Undue sophistication in the valuation of shareholders' funds is unlikely to be necessary.

3.4.4.5 Where adjustments to stated value are made, consideration will need to be given as to how these are to be communicated to end users.

3.4.5 *Embedded value*

3.4.5.1 This component of the value of a company represents the value of profits expected to arise in the future in respect of funds under management relating to existing contracts in force. In the next few paragraphs the method by which profits can be projected are discussed (in practice a detailed computer model would be used), and also the somewhat complex issue of choosing a discount rate to corre-

spond to the riskiness of unit trust business is examined. For a detailed discussion of the discount rate selection process, the reader is referred to Mehta (1992). The economic assumptions set out in these paragraphs more closely reflect the levels assumed by financial economists (also discussed in Mehta, 1992) rather than the rather more conservative levels typically used by actuaries in the U.K. for pension fund and life office financial reporting work. Rather different considerations may apply for a realistic appraisal of a company, and, for this reason, the assumptions differ from those used in Section 3.3.

3.4.5.2 The first step in the valuation process is to assess the likely level of future profits. For example, for investment trust funds under management, profits might be projected based on an annual management charge of 0.4% p.a., and a profit margin of 30% or 40% of this charge (that is, a total profit of approximately 0.14% p.a.). If the amount of funds under management is initially £100 million, the initial level of profit would be £140,000 p.a.

3.4.5.3 Based on full distribution, a shareholder in the fund manager would receive a net dividend of £94,000 (67% of £140,000), together with an accompanying tax credit of £23,000, making a total gross dividend of £117,000.

3.4.5.4 In practice, only a part of the costs to the investment manager of managing the investment trust funds will vary with the size of funds managed. The greater part of such costs is likely to be independent of fund size, although increasing with inflation (retail price inflation plus real earnings growth less productivity improvements).

3.4.5.5 For the projections of future growth in profit, an assumption is needed as to the rate of the investment trust fund charge, since this is subject to negotiation from time to time. One possibility is to assume continuation at current levels. However, in a competitive market, the amount of fund charge in the long run is likely to move in line with costs. If a constant rate of fund charge were assumed, profit margins would increase towards 100% over time. Therefore, it may be more appropriate to assume that, ultimately, overall profit will increase at a rate in between price inflation and the rate of fund growth. For example, of the total gross dividend of £117,000, perhaps £17,000 might be related to fund size growing at, say, 12% p.a. and £100,000 may be attributable to the fixed-cost element of the profit margin, increasing at, say, 4% p.a.

3.4.5.6 The next step is to assess the discount rates which appropriately reflect the riskiness of the profit flow. For example, for the fund size related element of profit, a key risk factor is the riskiness of the underlying portfolio of investments. If the value of this falls, the value of the annual management charge falls to the same extent. The value of future profits could be assessed using a discount rate equal to the rate of return on the underlying investments. Based on a dividend yield of 3% p.a. and growth of 12% p.a., the discount rate is 15% p.a. and the embedded value would amount to £0.6 million (£17,000/0.03).

3.4.5.7 For the fixed-cost component, the real yield on index-linked securities provides a guide to the level of discount rate. Costs are likely to be little correlated with market wide factors and have a low degree of variability, justifying use of a

discount rate close to the risk-free rate. As a guide, index-linked gilts yield approximately 4% p.a. and similar corporate securities yield approximately 5% p.a. Taking the latter figure, the embedded value of this component is £2.0 million (£100,000/0.05). The total embedded value is, therefore, £2.6 million or 2.6% of funds. Table 3.5 summarises the calculations.

Table 3.5. Illustrative valuation of investment trust funds/gross basis

Notional breakdown of gross dividend	Amount £000	Discount rate %p.a.	Growth rate %p.a.	Value of a £100m fund £000
Fund size related proportion	17	15.0	12.0	17/(0.15–0.12) =570
Fixed cost related proportion	100	9.0	4.0	100/(0.09–0.04) =2,000
Total	117	10.0[1]	5.5[1]	2,570

[1]*Equivalent single rates of discount and growth.*

3.4.5.8 Paragraphs 3.4.5.6 and 3.4.5.7 considered the embedded value of an investment trust manager from the standpoint of a gross investor who recovers tax credits on dividend receipts. A value can also be assessed for a net investor, for example a basic rate tax payer who has no liability to capital gains tax. This taxpayer will suffer tax, on dividends from equities and interest income from index-linked gilts, leading to net returns approximately 1% p.a. lower than for a gross investor. The discount rates needed to assess value are correspondingly 1% p.a. lower than for the gross investor; the profit stream to be discounted is 20% lower, resulting from the use of net dividends, not gross dividends. The resulting value is £2.7 million (£17,000 x 0.8/0.02 plus £100,000 x 0.8/0.04).

3.4.5.9 Another factor which may need to be taken into account in the investment trust example is gearing. Many trusts carry a level of borrowing which has the effect of gearing up the growth rate, but also increasing risk and hence the discount rate. These two effects tend to cancel each other out in the assessment of value, since the higher growth rate increases value, but the higher discount rate reduces it.

3.4.5.10 For open-ended retail funds, the riskiness of the underlying investment portfolio is often the principal risk factor. The rate of annual management charge is largely fixed, and the amount of charge received is, therefore, fully dependent on the level of the underlying funds, whereas only a part of expenses will be proportionate to fund value. This may also be true for investment trusts, to the extent that the competitive pressures, referred to in ¶3.4.5.5, do not apply. A reduction in the value of the investment portfolio will have a geared effect on the level of profits. For this reason, the discount rate required to value future profits is higher than the rate of return on the underlying investments. This may be particularly true for smaller funds if there is a high fixed or overhead component of total expenses.

3.4.5.11 The valuation can proceed by selecting this higher rate of discount by the use of judgement or by valuing gross profits before expenses (using a discount rate equal to the rate of return on the underlying investments), and then deducting the value of expenses. The discount rate used to value the expenses will be lower than the rate of return on the underlying investments, reflecting a proportion of non-fund size related expenses. This second approach has some advantages, since different unit trusts will have different relationships between revenue and cost, whereas the cost structure may be more uniform. For this reason, the discount rate appropriate to value net profits may vary more than the discount rate required to value expenses.

3.4.5.12 For an open-ended investment vehicle, another factor to take into account in the valuation is the rate of discontinuance or contract termination. For example, if a level 15% p.a. rate of repurchase is assumed for unit trust funds, and the rate of annual charge is 1.2% p.a., but the other assumptions are identical to those for the investment trust example, the value of an existing pool of unit trust funds amounts to 3.1% of funds under management, as illustrated in Table 3.6. The difference between this figure and the valuation factor of 5%, discussed in ¶3.4.2.3, arises primarily from goodwill, as discussed in Section 3.4.6.

Table 3.6. Illustrative valuation of unit trust funds/net basis

Notional breakdown of net dividend	Amount[1] £000	Discount rate[2] %p.a.	Growth rate[3] %p.a.	Value of a £100m fund[4] £000
Annual charge (1.2%p.a.)	804	14.0	12.0	804/(0.02+0.15) =4,730
Investment costs (0.24%p.a.)	(161)	9.0	5.5	(161)/(0.035+0.15) =(870)
Administration costs (0.2%p.a.)	(134)	8.0	4.0	(134)/(0.04+0.15) =(710)
Total	509	17.0[5]	16.0[5]	3,150

[1] Net of corporation tax.
[2] Since a net basis of valuation is being illustrated, the discount rates used are, as suggested in ¶3.4.5.8, 1% p.a. lower than those used in Table 3.5, which was constructed on a gross of tax basis.
[3] The growth rates are as shown for investment trusts in Table 3.5.
[4] In this column the denominators used to value the charges and costs in perpetuity are the sum of the rate of discontinuance and the difference between the discount rate and the growth rate.
[5] Equivalent single rates of discount and growth. In practice these would be derived from the internal rate of return which equates the net cash flows to the total value assessed.

3.4.5.13 Special consideration will need to be given to the treatment of any tied institutional unit holdings or contracts. The purpose of the valuation may determine whether the value of any existing relationship is to be included, and whether the possibility of this relationship ceasing is to be allowed for.

3.4.6 *Goodwill value*

3.4.6.1 The value of a fund management company derives, not just from the existing pool of assets under management, but also from its ability to attract additional funds through its existing distribution network. The value derived from this ability is called goodwill or existing structure value.

3.4.6.2 Consider, for example, a unit trust management company with funds under management of £100 million generating sales of £10 million p.a. The value generated by each year's new sales is 3.1% plus the difference between the initial margin and the distribution and other initial costs. If the initial profit margin is zero, the total value generated amounts to 3.1% of gross sales, that is £0.31 million p.a.. To the extent that sales vary substantially with stock market levels, there is a high level of systematic risk and a low goodwill multiplier (akin in many respects to a P/E ratio) needs to be applied. Applying a goodwill multiplier of $7^1/_2$ times results in a capitalised value of all future sales of £2.3 million, or 2.3% of funds under management. Adding this goodwill value to the embedded value of 3.1% results in an overall estimate of total company value of 5.4% of funds under management.

3.4.6.3 In practice, it is often useful to examine the goodwill multiplier in more detail, as different companies will have different types of distribution channel with varying growth prospects, degrees of tie, etc. A multiple of $7^1/_2$ broadly corresponds to using a discount rate of 17% p.a. if growth is a constant 4% p.a.

3.4.6.4 The actuary will need to ensure that the multiplier is reasonable in a market context. It will often be useful to analyse actual transactions and to examine quoted company share prices, and to compare these with estimated appraisal values.

3.4.7 *Variability of appraisal values*

3.4.7.1 Both embedded values and goodwill values vary greatly from company to company, and also vary from year to year.

3.4.7.2 The embedded value of a unit trust business, consisting solely of traditional retail lump sum investment products, could amount to up to 5% of funds managed, depending on the level of fund charges. Much lower proportions could apply for PEP products and for life office unit holdings subject to a high rebate. The difference arises, not just because of the higher profit margin which generally applies for traditional retail business, but also because expenses are a lower proportion of gross margins, and therefore contribute less to overall risk for such products.

3.4.7.3 Value placed on goodwill is, of necessity, somewhat subjective. The range of values between companies is wide, because both sales, compared with funds managed, and profitability vary greatly. In assessing value, it is especially important to ensure that sustainable levels of sales and realistic long-term profit margins are selected. For example, a group might have experienced exceptional levels and growth of sales on the back of a good investment track record. The valuation needs to allow for the possibility that the investment track record reverts to median levels, and that sales decline as IFAs switch to alternative providers. Either

the goodwill multiple or the starting level of sales needs to be adjusted. Profit margins could also be affected. The extent of the fall may be mitigated if there is an existing base of unit holders generating a continuous stream of repeat sales or if the company increases its marketing and advertising spend or can communicate effectively to IFAs via a tied salesforce.

3.4.7.4 For any individual group, the embedded value will be affected by various factors, including stock market movements; goodwill value will also depend on any changes in estimates of long-term sales levels and profitability. The degree of volatility can be reduced for reporting purposes, for example by using a smoothing process to modify the effect of market movements and by using a gradual approach when changing sales level assumptions. The degree of subjectivity is reduced if reported values exclude goodwill value.

3.4.8 *Advantages of a scientific approach*

3.4.8.1 The degree of sophistication required for any particular appraisal will depend on the individual circumstances. For some applications, more or less sophisticated computer models will be needed to provide the required degree of accuracy and understanding. In other cases, the approaches set out in this section can be applied without the need for complex programming.

3.4.8.2 Valuations benefit from the use of a scientific approach, rather than the traditional rule of thumb method, because of:

— greater accuracy in tracking transaction or market prices; and
— better understanding of the relative importance of different factors in creating shareholder value.

3.4.8.3 As a minimum, the scientific approach provides guidance as to how rule of thumb valuation factors need to be modified to take account of differences in, for example:

— fund charges;
— expense levels;
— asset mix;
— rates of repurchase and income payment;
— regular savings proportion of business sold;
— level and profitability of new sales; and
— expected future growth in sales.

3.5 *The Investment Trust Discount*

3.5.1 *Introduction*

Much of Section 3 has concentrated on issues relating to unit trusts. The following paragraphs examine some aspects specific to investment trusts, particularly the relationship between the market price of investment trust shares and the underlying net asset value. The ratio of market price to net asset value varies widely over time and between different trusts. Frequently shares trade at a discount, with an average discount to asset value for U.K. investment trusts, at the time of writing, of approx-

imately 9%. Over the years, many reasons have been advanced to explain the discount, and the issue is important, not just in assessing the value of an investment trust, but also because of the light it may shed on the valuation of other corporate entities which hold securities and cash on their balance sheets. A better understanding of the discount may also help investment trust managers to maximise shareholder value.

3.5.2 *Variations of the discount in the U.K.*

3.5.2.1 Although the average discount in the last few years has been of the order of 10%, the average discount for much of the 1970s and for the first half of the 1980s was of the order of 30%. At its peak, the discount widened to over 40% in the mid 1970s, approaching the 50% discounts arising at the time of the Labour Government dividend freeze between 1949 and 1951. On the other hand, a relatively modest discount, of the order of 10%, applied for much of the 1960s.

3.5.2.2 Individual investment trust shares exhibit discounts which may differ greatly from the average discount for all trusts. The level of dispersion varies: in some years most trusts have discounts which are reasonably close together; in other years a significant number of trusts stand at a substantial premium to net asset value and a significant number at a large discount.

3.5.3 *Factors giving rise to a discount or premium*

There has been relatively little quantitative research into the size of the discount, and there is considerable uncertainty as to the relative importance of different factors. Explanations need to be viewed in the context of the overall market background for investment trusts. The first trust was formed in 1868, and for the first one hundred years trusts were mainly held by private investors. A narrowing of discounts in the 1960s led to increased supply, with the creation of new trusts and a subsequent widening of discounts. With the decline in importance of private clients, share prices depended on the support of the institutions, many of whom could readily achieve their diversification or other investment needs through alternative direct investment. These institutions required a discount in order to compensate for any additional investment expense or other costs associated with holding investment trust shares compared with direct investment. Since the early 1980s, managements have adopted a variety of policies to enhance the attractiveness of investment trusts, for example to more closely specify investment policy, to focus on investor needs and to adopt strategies such as the introduction of regular savings schemes and PEP based products, which bolster demand for the shares. The possibility of corporate activity, when discounts widen, has also become an important influence over the last fifteen years.

3.5.4 *Trust management and investment costs*

3.5.4.1 Management costs depend particularly on the size of funds managed and the type of assets. For a large investment trust investing in the main securities markets, management costs are often of the order of 0.3% to 0.5% p.a. of funds

managed, a slightly higher proportion of share price after allowing for the effects of gearing and the discount. The smaller trusts, and also trusts specialising in a particular market, will often incur a much higher level of cost, 1.0% p.a. of funds or more.

3.5.4.2 For a private investor, the benefits of diversification or of low cost investment in a chosen market may outweigh the relatively modest costs of investment trust management. This may not be the case for an institutional investor. For such an investor, the financial comparison is whether the benefits from purchasing assets at a discount outweigh the additional management or other costs resulting from investment trusts rather than direct investment. For example, use of a standard dividend discount model in perpetuity would suggest that the benefit arising from purchasing assets at a 13% discount would equate to a cost of 0.4% p.a., when the dividend yield on the trust is 2.6% p.a. In other words, the effect of a 0.4% p.a. investment cost is to reduce the dividend income stream by 13% from 3.0% to 2.6% p.a., and, therefore, to reduce the value of the investment by this proportion. In practice, as noted in ¶3.4.5.5, costs as a percentage of funds may be expected to reduce over time, and this method, therefore, overstates the effect on the discount.

3.5.4.3 Management costs have a disproportionate effect on trusts which invest in low dividend yield shares, for example in certain overseas markets. However, this may not necessarily result in a higher discount. Supply/demand factors will limit the number of trusts entering a particular market, and, therefore, help to limit the size of any discount. If the discount widens, the possibility of corporate activity arises, as discussed below.

3.5.4.4 An active management policy may generate value, although the available evidence suggests that this value is absorbed by the resulting higher transaction and management costs. The influence of an active policy on the size of the discount is, therefore, not clear cut. To the extent that dealing costs are not offset by value created, the dividend model would suggest that such costs need to be added to management costs when assessing the discount. An average investment trust has an activity rate of approximately 40% p.a., leading to total transaction costs of 0.5% to 1.0% p.a. of funds managed.

3.5.5 *Capital gains and income taxes and exchange controls*

3.5.5.1 Following the introduction of capital gains tax in 1965, gains made by investment trusts were subject to tax at the rate of 30%; this rate was reduced to 15% in 1972 and to 10% in 1978. From April 1980 capital gains were exempted. From 1972 to 1980, in order to avoid double taxation, investors were granted varying levels of tax credit to offset the impact of tax on gains within the trust. For example, between 1978 and 1980, the tax credit was 10% of gains, for offset against an investor's own personal capital gains tax liability. Since 1980, personal capital gains tax allowances have increased, an indexation allowance has been introduced (from 1982), and the influence of capital gains tax on the size of the discount may, therefore, have reduced (discounts calculated typically do not allow for the potential liability for capital gains tax). Nevertheless, variations in the discount

may still reflect the effect of capital gains tax. For example, investors may be reluctant to sell investment trust shares if doing so would result in a crystallisation of a capital gains tax liability. This possible reduction in the supply of shares when share prices are high could account for a part of the observed tendency for discounts to narrow during market rises.

3.5.5.2 For the whole period between 1965 and 1980, the capital gains tax rules for investment trusts placed them at a disadvantage relative to direct investment, for investors not subject to capital gains tax, for example pension fund investors.

3.5.5.3 The effects of income and profits taxes on trust distributions and retained earnings may also influence the size of the discount, if such taxes result in a penalty to investing in investment trusts compared with direct investment. As for the effect of management costs, income and profits taxes would directly reduce the level of dividend income received and, therefore, the value of the investment. However, at present, the effect of the system of imputation tax introduced from 6 April 1973 and the further changes to the treatment of company distributions introduced by the Finance Act 1993 and the Finance Act 1994 suggest that there is little penalty to investment in U.K. equities through investment trusts. The historic position has not been investigated. The effect of overseas withholding taxes and of corporation tax at the full rate on unfranked income receipts may result in a disadvantage for overseas investment, and may be one of the factors leading to relatively high discounts for many specialist overseas investment trusts.

3.5.5.4 Exchange controls, between 1947 and 1979, restricted the ability of trusts to gain the desired level of overseas exposure. In 1965 the 25% surrender rule was imposed, which required the surrender of 25% of the proceeds from the sale of foreign investments at the official rate of exchange. The surrender rule resulted in a drag on the performance of investment trusts, and was not abolished until 1978. Overseas exposure had declined to 32% by 1980; by 1983 the proportion had increased to just over 50%, its current level.

3.5.5.5 Trust discounts, stated net of the 25% surrender penalty and after an allowance for the potential capital gains tax liability, could be substantially different from quoted levels for years between 1965 and 1980.

3.5.6 *Corporate structure*

3.5.6.1 Perhaps the first trust designed specifically to reduce the size of any discount was The Child Health Investment Trust, issued in January 1980. This was a simple split level investment trust with a combination of equity and loan capital, the loan capital being entitled to all the income and the equity shares entitled to all the capital appreciation. The trust had a fixed five-year maximum life, at which time it was converted into a unit trust. Shareholders were given an opportunity, each year, to consider a voluntary winding-up. The trust differed from the early two-tier trusts issued in the late 1960s, which had long (20 or 30 years) life spans, and from geared capital shares, mainly designed to be attractive to investors suffering high marginal rates of tax. Since 1980 many different types of trust structure have been introduced.

3.5.6.2 In contrast to ordinary investment trusts, the discounts on capital shares of split level trusts tend to increase as markets rise and narrow as share prices fall. This anomaly arises, particularly for highly geared long-term trusts, because the values of the corresponding income shares are relatively insensitive to changes in equity values. The nature of the discount for capital shares differs from that for other investment trusts, because of the deferral introduced by giving up income to the income shares.

3.5.7 *Corporate activity*

3.5.7.1 Limits on the size of the discount arise from two main factors. Firstly, shareholders and/or management can propose unitisation of the investment trust at any time. The costs of unitisation are relatively modest, although the total effective cost may be high for any individual investor if there is any crystallisation of a capital gains tax liability.

3.5.7.2 Secondly, pension funds and other institutional investors may consider making a takeover bid for an investment trust if its discount exceeds the bid premium that would be required. The feasibility of purchasing assets at a discount may be particularly attractive if the institution has a positive cash flow and needs to hold securities which broadly correspond to the assets held by the trust. A number of such acquisitions have been made. Individual companies have, in the past, acquired investment trusts through the issue of shares, and then liquidated the trust portfolio for cash, as an alternative to making a rights issue.

3.5.8 *Qualitative factors*

3.5.8.1 Some factors which impinge on the size of the discount are qualitative in nature and difficult to quantify. Special trusts, providing investors with the means to invest in markets or sectors which are not readily accessible by other means, may trade at a premium to net asset value, until new trusts and fresh capital are also attracted to the sector.

3.5.8.2 Trusts with management which exhibits superior investment skills may also trade at a premium or at a lower discount. In practice, the available evidence suggests that added value from the average investment manager falls short of the cost of investment management, so that performance typically falls short of that on the standard market indices, once the effects of gearing and the discount are taken into account. There is also little definitive evidence that historic investment management out-performance arises other than by chance.

3.5.8.3 These observations suggest that the link between the size of the discount and predictors of investment out-performance may be more tenuous than commonly believed.

3.5.8.4 Historically, investment trusts were disadvantaged relative to other collective investment vehicles, given restrictions on advertising and retail distribution, as well as the lack of any substantial commission related selling incentive. The relatively small discount which now applies to many trusts specialising in U.K. equities

may reflect the effect of retail demand arising from the introduction of PEPs and savings schemes.

3.5.9 *Other factors*

A variety of other factors have been suggested as influencing the level of the discount. For example Thomas & Feldman (1977) developed a model linking trust discounts to the gearing ratio, the portfolio distribution, dividend yield, marketability and the level of interest rates. The discount was found to increase with increases in interest rates. Market sentiment is that trusts with a higher dividend yield have lower discounts (this has led to calls for expenses to be met out of capital rather than income).

3.6 *Investment Modelling*

3.6.1 Prospective investment returns on the assets held by financial institutions are uncertain. A thorough investigation will often need to take into account the possibility that investment returns will depart from the expected level, and will consider a range of possible outcomes and the likelihood of extreme events. This is particularly true where the financial measure being examined (for example, annual management fee income) depends on the level of investment performance which is achieved.

3.6.2 Actuaries have developed a number of approaches to financial modelling allowing for investment risk. The degree of sophistication used will depend on the nature of the problem:

— For some applications, a simple deterministic approach may suffice. Typically, a central assumption is made that the investment return will be a fixed rate in the future. A limited number of variations from this rate may be considered, to test the sensitivity of the results to changes to the central assumption.
— In other cases, a fairly simple model of investment return behaviour is used. For example, returns could be assumed to follow a normal or lognormal distribution with pre-specified mean and variance. Again, the sensitivity of the results to variations in the parameters may be tested on a deterministic basis.
— Sometimes a stochastic asset model is used. The model attempts to replicate approximately the variety of interactions between the returns on alternative asset classes, and a large number of simulations are run through the model.

3.6.3 Stochastic simulation is most useful where the patterns of asset and liability cash flows are complex. For the financial modelling of a unit trust company with a traditional product range, a deterministic approach to asset modelling will often be perfectly adequate. However, there may be circumstances when stochastic modelling could be used to good effect. Some examples are:

— A unit trust company has a somewhat different asset strategy from that of its main competitors. Good relative investment performance will generate additional new business. Stochastic simulation may help in assessing the likelihood of its strategy succeeding.

— A unit trust manager wishes to choose between a straight equity investment strategy and the cost and benefits from also purchasing put options. Stochastic simulation will provide an indication of how the probabilities of alternative investment returns being achieved will change if the put option strategy is adopted. More generally, such modelling could be desirable if non-traditional asset strategies are adopted.
— If products are sold which carry investment guarantees, stochastic simulation will help to show the effect on expected returns and on the expected cost of giving the guarantee.
— New business sales and also lapse rates (that is, sales and repurchase activity rates) vary according to investment and economic conditions. Past experience shows that sales typically increase when interest rates are low and stock markets are rising. A stochastic model which incorporates these interactions will assist management to assess fully the alternative strategies available.

3.6.4 Asset modelling is a highly specialised area, requiring considerable experience and expertise. A good deal of judgement may be required as to the input parameters used to characterise the asset return distributions and the asset/liability interactions. The asset model itself needs to be sufficiently sophisticated in order to properly reflect these characteristics, having regard to the type of question being asked, the level of accuracy needed and the importance attaching to the decisions being taken. Sophisticated models are difficult and time consuming to build, and, quite often, the actuary will not have the resources to devote to such modelling. It is better to use a simple and understandable model, or, perhaps, to use a simple deterministic approach than to use a more sophisticated model which is not fully understood. Whatever approach is adopted, the accuracy and reliability of the results should be carefully considered.

3.6.5 Having said all this, it would be a pity if the profession did not utilise its skills in financial modelling in these new and exciting ways. With increasing product complexity and competition, there are likely to be many circumstances when one or more of the uses of stochastic modelling listed above will prove beneficial.

3.7 *Risk Assessment and Control*

3.7.1. *Introduction*

The control and assessment of risk has traditionally been an important area for life office actuaries, who have applied their skills to the identification, quantification and reduction (elimination) of risk. In one sense elimination can be unproductive, in that profit and an element of risk tend to go hand in hand. The objective is often to create a balance that maximises the business result within an acceptable and, it is hoped, controlled degree of risk.

3.7.2 *Risk analysis for a life office*

3.7.2.1 For a life office, the main areas of risk revolve around the process of acquiring new business; the financial strength of the company; mismatching of

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assets and liabilities; and unresolved business or service issues (e.g. from poor computer systems). These areas are not always independent of each other. For example, perceived financial weakness or poor administration may directly affect the levels of new business written. The first three areas often carry a strong investment-related risk, as poor investment performance can damage new business and solvency.

3.7.2.2 The systematic identification of risks through a mapping process is a valuable tool. Risks that are known in isolation, through mapping will be seen in an overall and interactive context. This process should also show the current management controls in place, and highlight gaps in reporting. It is crucial that responsibility for monitoring and managing the risk is assigned to specific individuals. An all too familiar example is:

Item of risk	Current expense overrun
Controls	Expense monitoring and analysis Actual costs v budgeted expenses (by reference to anticipated new business) Actual results v plan for overrun elimination
Responsibility	Appointed Actuary.

3.7.2.3 Once the mapping is complete, the risks can be categorised as, for example, high, medium or low. It is at this point that the analysis becomes somewhat subjective, but it enables the actuary to move from the risk to an assessment of the financial consequence of the risk, and then to an assessment of the risk capital requirement. Risks can be seen as split between those largely outside management control and often common to the industry, e.g. resulting from legislative change; and those within management control, whether unique or common. It is the latter group that requires particular attention, although strategies may be found to limit the impact of the wider group.

3.7.3 *Risk analysis for unit trusts*

3.7.3.1 The above relates to a life office environment, but there are many aspects that are also relevant to unit trusts.

3.7.3.2 As noted above, many areas of life office risk are, in some way or other, investment related. This is true to an even greater extent for unit trusts, as investment performance tends to be the driver in terms of obtaining new business. Here, a main objective is to outperform the competition rather than simply achieve good overall returns in absolute terms.

3.7.3.3 The main on-going revenue is related to investment returns through the application of a fund management charge. Hence, poor investment performance can hit profitability by reducing the income stream to cover expenses. Charges may be

increased, but the trust deed must state the charges which the managers propose to make at outset, and also the maximum to which they may be increased without the need to go back to the unit holders to approve the increase. Competition is likely to make increases difficult to apply in practice. In the developing market place, with direct telephone operation entrants, the main criteria for selling is charges rather than investment performance. Also, some unit trust companies obtain substantial sales from existing clients. Raising charges only for existing customers may also affect sales.

3.7.3.4 Assessment of the expense and investment risk can be achieved through the use of the techniques covered elsewhere in this paper, in particular asset/liability modelling.

3.7.3.5 Unit pricing also carries risk to the managers where pricing is carried out on an historic basis, particularly for an active fund. There is a need to accrue costs, and failure to do this can result in a real loss. There is also the aspect of not maintaining equity between various parties. In particular, single pricing will increase this risk where significant money is coming into the fund and expenses are not adequately charged for. Existing holders may end up paying for the dealing costs of those coming in and out of the fund.

3.7.3.6 Where dealing with investors takes place at historic prices, there is a risk to the manager of unit price fluctuations, because all deals with the trustee for creation or cancellation of units outside of the two-hour window since the last valuation point must be carried out at a forward price. This risk is limited for larger individual deals, in excess of £15,000, as these can be forward priced.

3.7.4 *Special risks arising from the use of derivatives*

3.7.4.1 As an example, consider the risks associated with index tracking funds using futures for cash flow management purposes. Use of futures enables the investment manager to sell and buy stock, whilst cash flow is building up, to avoid the risk of losing out on index movements in the interim. It also allows immediate reaction to both rights issues and investors' withdrawals which require cash. The alternative, selling stock, can be expensive.

3.7.4.2 This operation can give rise to the following risks:

(1) *Basis risk.* This comes from the possibility of divergence between the market index and the futures index, particularly if there is market turbulence from, for example, political uncertainties.

(2) *Roll over risk.* The index future available is written on a quarterly basis. Going over to the next quarter carries a risk in the terms available for roll over.

(3) *Counterparty risk.* This is a well known issue with derivatives, akin, in some ways to bankruptcy risk when buying individual bonds or shares. The use of a reputable investment house is one reduction choice available, although it is difficult to monitor and control overall exposure. In practice, there are various solutions, including daily marking to market, which can be used to control or reduce the possibility of a default.

(4) *Understanding risk.* Unless one is dealing continuously and is an expert in

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the use of derivatives, there is a real risk arising from lack of familiarity and understanding. Quick exposure at little immediate cost is on offer, giving rise to gearing risk.

(5) *Control risk/system monitoring risk.* Controls from outside the dealing area are crucial.

3.7.4.3 Some or all of these risks may be insignificant or manageable, but, nevertheless, need to be examined individually as a check.

3.7.4.4 Aspects of fund management risk control were covered in detail in Gardner & Rains (1995).

3.7.4.5 Recent experience in the United States of America suggests that a fund might find that there is a legal duty on a fund manager to use hedging techniques, to protect against losses in the value of the fund's assets. It will be interesting to see if a similar precedent can be established in the U.K.

3.7.5 *Other areas of risk*

3.7.5.1 From a marketing point of view, new funds are often perceived to be attractive. However, the more obscure funds may well attract insufficient investors to achieve the minimum size required to run them profitably.

3.7.5.2 There are certain risks associated with systems and administration. They range from lack of control, and hence possible compliance risk, to questions on the ability to service customers effectively. A substantial part of the administration in the unit trust industry is by third party, which has its own inherent risks, both for the supplier and the receiver of the service.

3.7.5.3 It is often useful to undertake an actuarially-based risk audit, which would examine the various areas of risk, assess the likelihood of extreme adverse events, establish levels of capital requirements and set out the levels of return required for accepting any given type or size of risk. It is also useful to assign risk management responsibilities to specific individuals, in order to ensure that risk concerns are seriously tackled.

4. CONCLUSION

4.1 The unit trust industry is entering a period of potentially rapid change. The introduction of OEICs coupled with increasing competition, both in terms of products and providers, all lead to a market place in which the assessment and management of financial information will become critical to continued success. It is to this environment that the actuary can bring his skills and expertise.

4.2 Greater competition will result in unit trust companies having to operate on tighter margins. Further, the recent move in the market to reduce or eliminate the initial charge paid by investors makes it increasingly important for companies to adopt a more rigorous approach to measuring profitability over the lifetime of a product, to assess the value of their customers and to manage their capital

resources. All these changes result in the need for greater control and understanding of the company. This will need to be an overall iterative process, rather than a series of one-off investigations.

4.3 Detailed statistical analysis of product and customer data is invaluable for improving the effectiveness of marketing, in designing improved products and in developing optimal operating targets.

4.4 In today's business environment, managing the value of an investment management company, and being seen to do so, is becoming increasingly important. An actuarial approach to assessing value provides real benefits over the traditional rule-of-thumb approach. For a financial institution transacting a variety of businesses, it provides a standardised comparison of financial performance. Within a business, it provides a guide to underlying and comparative performance of different products sold, and shows how value is changed according to trends in factors such as redemption rates, market levels, etc.

4.5 Life company and banking groups are now familiar with embedded value techniques as a management tool; their use for unit trusts is a natural extension. A familiar path may be envisaged to that trodden by life companies, the internal publication of embedded value results leading to better understanding and management of the business, followed by pressure for adoption of the method (or similar methods) for external reporting.

4.6 During the course of their work on this paper, the authors applied the actuarial valuation techniques suggested to the published accounts of a number of quoted specialist unit trust companies. Appraisal value results were found to be broadly consistent to share prices. In the authors' experience, the derived values are also broadly consistent with transaction prices for fund management companies operating under a range of differing circumstances. It is worth remembering the experience of a life company when embedded values were produced at a late stage during the defence of a takeover; a principal benefit lies in the regular publication of results derived on a scientific basis rather than as a one-off exercise. Ultimately, the pressure for change may well come from shareholders to provide both more meaningful information on performance and to establish a more robust share price.

4.7 Given all of the above developments, we predict that more and more attention will be paid, in future, to the use of profit testing, embedded and appraisal value techniques in the unit trust industry and other collective investment schemes. It remains to be seen whether the accountancy profession will look to apply other methods, such as deferred acquisition costs or the achieved profits method, to replace the current accounting practices of unit trust companies. Whatever the developments on this front, we believe that actuaries can make a real contribution to the financial management and reporting of unit trusts and other collective investment schemes.

4.8 The special skills which actuaries have developed, with regard to asset modelling in a complex financial product/institution environment, are well suited for adaptation to the unit trust industry.

4.9 Increasingly, companies in the financial and non-financial sectors are turn-

ing to the sophisticated risk identification and measurement techniques. As new products are introduced, for example guaranteed products, there will be an increasing need to establish required capital levels and to price products allowing for an appropriate risk/return trade off.

4.10 As unit trusts further seek to improve investment performance and to manage their business profitably, so the potential for the use of derivative-based instruments increases. In this environment, both the use and control aspects become increasingly complex and important.

4.11 Actuaries have developed a variety of techniques to assist the life industry improve marketing effectiveness, enhance product design efficiency and manage the disclosure, best advice and other issues arising from recent consumer legislation. Similar issues arise for the design and marketing of retail collective investment schemes.

4.12 As collective schemes become more complex, the need to understand and manage business and financial risk increases. The techniques outlined in this paper place the actuary in a unique position to add value to existing management processes and skills. However, the starting point must be an understanding of the unit trust business, and creating both an interest in, and a desire to know more of, how it functions. For those unfamiliar with the subject, this paper is, we hope, a useful start to that process.

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We should, however, make it clear that the views expressed in the paper are entirely the authors' own, and responsibility for any errors rests with us.

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ABSTRACT OF THE DISCUSSION

Mr D. M. Riddington, F.I.A. (introducing the paper): In the summer of 1994, FIMAG, as it then was, established a working party to examine ways in which the actuarial profession could assist with the financial management of collective investment schemes, and to develop our own understanding of these vehicles. From the beginning of 1995, the working party has reported to the Wider Fields Board. It has also had discussions with the Association of Unit Trusts and Investment Funds (AUTIF), and has talked with a number of specialist unit trust companies.

The more complex pricing structures recently introduced by the investment industry, including the absence of front-end charges and early termination fees, has brought products closer in design to those promoted by the life assurance industry. Some of the management techniques used in life assurance may, therefore, prove helpful to the management of investment companies.

The paper has been written at a time of change in the unit trust industry. Single pricing, the introduction of open-ended investment companies (OEICs), charging disclosure, the new competition from telephone operations, provide both challenges and opportunities for the unit trust industry. The financial services industry is being challenged to think cleverer, operate smarter. Actuaries have something to offer to aid moving profitably through this seeming minefield of change.

The structure and ownership of the industry is also under challenge. The assessment and management of a company's external value (or price) and its interaction with internal financial management are key issues for the future.

The first part of the paper provides a background to unit and investment trusts, OEICs and PEPs. It covers the operating environment and regulatory and fiscal framework. Most of this will be very familiar to those directly involved, but will put the rest of the paper in a sound context for those with no day-to-day experience.

The second part of the paper introduces various aspects of financial management of the vehicles, concentrating on the skills that actuaries can contribute. It highlights improved data analysis and the benefits to be gained from an embedded value approach to profit reporting. In particular, in Section 3.4.5, it works through an illustrative example, and then goes on to show how appraisal value techniques can be applied and considers risk management techniques. In view of the growth of guaranteed products, the whole area of risk management may well need a higher profile in both the quantifying and management of the risk.

From the customer perspective, how well do buyers understand the inherent degree of risk in the investment choice they make? Do we, as an industry, do enough to aid understanding and decision making by the policyholder or unit holder? Here a role traditionally undertaken by the IFA may need reinforcement, as more is sold in direct transactions between customer and supplier.

Appraisal values became a highly topical subject for the unit trust industry when, in February 1996, NatWest announced an agreed bid for Gartmore. Even if one only uses publicly available material, it is possible to use techniques covered in this paper to get a view of the price paid for the company. Press speculation over the future of Perpetual, to name but one, focuses attention on the methods used in putting a full and realistic value on purchase. It is interesting to recall that the Pearl takeover by AMP gave an impetus to the use of embedded value techniques within the life assurance industry. With the changes emerging in the unit trust industry, these techniques may also find favour.

Mr M. R. Poulding, F.I.A. (also introducing the paper): There are several aspects of the paper that need updating, in particular the OEIC regulations quoted in Section 2.1.4; the recent sales experience quoted in Section 2.2.1; and the PIA disclosure proposals quoted in Section 2.2.2.

Sales in the second half of 1995 totalled £2bn for unit trust PEPs, and £9.9bn for total unit trust sales, which made the proportion of PEPs 20% in the half year and 22% for the whole of 1995. The total value of unit trust funds at 31 December 1995 was £112.9bn.

In the first two months of 1996 a further £1bn of PEP sales were recorded out of total unit trust sales of £4.6bn. At the end of February the total value of unit trust funds had increased to £120bn.

As regards disclosure, the Office of Fair Trading has caused a delay to the implementation of the new regime for unit trusts by alleging that the PIA proposals set out in Consultative Paper 8 are anti-competitive. The OFT feels that similar disclosure rules should apply to both life assurance and unit trust products, in particular as regards the method of projecting the impact of charges. Revised proposals from the PIA are currently awaited, although there appears to be a disagreement on the interest rate to be used in the projections.

There has been little development in the area of OEICs. Draft regulations from the Treasury under the European Communities Act are due out early in summer 1996. One change in approach, recently announced in the House of Commons, is that it appears that a single 'Corporate Director' will be acceptable as an alternative to appointing several individual directors.

A further recent development is the growth of unit trusts offering a form of investment guarantee, normally within the structure of a personal equity plan.

AUTIF is currently in discussions with the SIB on the use of the word 'guaranteed' in the title of unit trusts, and in particular is covering the various ways of providing the guarantee — that is, by using derivatives under the unit trusts own investment strategy or by using a separate guarantee provided by the parent or an independent third party.

Mr P. W. Wright, F.I.A.: The authors draw attention to the well-known phenomenon that purchases of units tend to be concentrated towards peaks in the equity markets and repurchases towards troughs. Whilst most of the loss involved falls to unitholders, the company itself suffers through lower growth of management charges. Therefore, when profit testing these products, assumptions regarding long-term capital growth should be below the assumed average for the investments comprising the trust. A similar argument would probably apply for single premium unit-linked bonds. I am not aware that this feature is generally allowed for.

In Section 3.3.7 the authors refer to the use by some unit trust groups of deferred acquisition cost (DAC) assets. They state that the period of amortisation is "of necessity, arbitrary." My own employer's unit trust subsidiary uses a DAC asset to cover indemnity commission paid on regular savings plans, and amortises this over the commission clawback period. I do not believe this to be arbitrary. Indeed, if the practice became more widespread to cover other circumstances, we could, theoretically, envisage United States GAAP style rules to dictate the pace of amortisation.

The authors make an interesting case, in ¶3.5.4.2, for the current size of discount on investment trust shares using the dividend discount model in perpetuity. In ¶3.5.9 they state that "market sentiment is that trusts with a higher dividend yield have lower discounts", but this is to be expected if the dividend discount model is correct. In ¶3.5.9 the authors also state that this phenomenon has led to calls for expenses to be taken out of capital rather than out of income, but this practice and the equivalent for unit trusts are, in my view, unethical, as they can penalise shareholders or unitholders who are income tax payers, but do not pay capital gains tax — that is, the majority.

Whilst the dividend discount model has attractions as an explanation of the discount on investment trust shares, it is difficult to accept its use in perpetuity. This would suggest that trusts which invest in very low yielding securities could stand at a 100% discount — which would certainly make them attractive purchases. Perhaps the model should assume wind-up of the trust after a certain period of years.

When reading the paper, I found myself speculating on the debate which might have gone on amongst the authors regarding the very short statement which comprises ¶3.2.3.2; namely, "In practice, box management could be a large source of profit in the past, but tighter rules have significantly reduced the scope for this." If I had been on the working party, I might have pressed for some disclosure as to how these past large profits had arisen!

Mr G. R. Marshall, F.F.A.: As someone who has recently worked in the unit trust industry, I found it somewhat unnerving to realise that the work that I was doing on embedded values might be regarded as leading edge. This paper clearly signifies that the cavalry has arrived, which is comforting, and should signal the beginning of the battle in earnest to win over a sceptical industry.

In Section 3.1 particular attention is required in the area of investment management expenses.

These are likely to be expensive individuals with expensive travel arrangements and expensive equipment. It is obviously more expensive to carry out research in emerging markets, for example, than for, say, United Kingdom equities. Other than just breaking down the normal categories of expenditure into different departments, there is a necessity to go deeper, particularly in the fund management area, and understand where the costs are arising in investment management.

I am surprised to see how little analysis has been undertaken in the area of commissions. Fund managers tend to have close relationships with their brokers and guard them very closely, arguing that commissions are justified on the back of the better advice that they receive. This needs to be investigated and proven or otherwise.

On box management, in Section 3.2, the point that did not come through is the strong pressure that tends to come from IFAs, particularly with discretionary fund managers who deal in volume; the pressure is not to move the basis against them. For example, consider a fund which is on a bid basis, representing a net outflow of funds, and there is a deal from an IFA dealing in volume which pushes the fund into a net inflow situation. This deal will move the fund to an offer basis and then back again to a bid basis the following day, if an unhappy IFA refuses to do business with you. That is clearly a problem for small funds. In these circumstances, I wonder if it is justifiable for the manager to consider forfeiting some margin in order to achieve sales and to boost the fund size.

In Section 3.3 measuring investment performance can be quite difficult in very specialist areas, for example some of the emerging markets and technology funds. There are very few competitive funds, and it is difficult to measure relative investment performance.

In terms of management controls, compliance breaches should be added to the list of checks. One would hope that the number is very small, but there is an argument for encouraging open monitoring of all breaches, even minor ones which would not breach IMRO regulations, such as the $\frac{1}{2}\%$ rule in pricing, so that there is an open environment for raising these issues and identifying trends.

The paper refers to differences between unit trust operations and life companies. One of these is the variety of distribution outlets in place in even the smaller companies. You often find direct mail, direct response advertising, distribution through IFAs, and some dealings, perhaps, with institutions, where they are buying specialist funds for private clients. Basically, the same product with the same charging structure has been sold to all of those channels, despite very different cost bases, although the institutions are likely to command discounts. I am interested in views on whether the introduction of OEICs with the multi-class share structure is likely to change this, and whether we will see products tailored to different channels.

Looking further afield, I am interested in whether the hub and spoke concept or master feeder fund concept is likely to take off in the U.K. and Europe as it appears to have done in the United States of America.

Considering the sales of unit trusts by traditional life company sales forces, selling to IFAs as opposed to direct sales, here there is another area that I would draw a distinction between unit trust companies and life companies. This does not appear to be a viable route for selling unit trusts; there are insufficient margins to remunerate a salesforce which sits between IFAs, who require remuneration, and the specialist up-to-date knowledge required to penetrate investment oriented IFAs, as opposed to more generalist IFAs, is difficult to achieve. You cannot communicate adequately with a salesforce of several hundred when you need to communicate up-to-the-minute investment information. The solution could be a salesforce of perhaps 5-10 covering the top 1,000 IFAs well, with relatively infrequent visits, but constant telephone communications. The remainder of the market could be covered by mail and telephone communication. Otherwise there is no way of covering the margins.

Professor A. D. Wilkie, F.F.A., F.I.A.: I offer a few thoughts generally about unit trusts rather than about the paper. In the first place, there are more unit trusts than there are companies listed in the All-Share Index — almost twice as many. That does not include the insurance-linked funds, just the unit trusts — 1,500 of them, as quoted in the paper. It is a strange way that the market has developed. Why do people not buy shares rather than go through intermediaries so much? We advise the

intermediaries, so it is good business for us. It does not seem necessarily good business for the customer, particularly when you look at the charges.

The charges of 1.5% of the assets at the very top end, on shares which are yielding, say, 3.75% is exactly 40% of the income. That means that all the tax benefits on PEPs are going to the providers. It is a complete waste of time for anybody, so far as I can see, to buy PEPs in order to save income tax. It might be an advantage to save capital gains tax, but only if you are not making use of your capital gains allowances anyway. Even charges of 1% of the asset value on a dividend yield of under 4% is more than 25% of the income. In addition, there is the front end loading or the back end loading.

Are the public so naïve that they can be conned into buying unit trusts, or unit-linked life products which have a very similar charging structure, rather than buying shares directly? Have the journalists not caught on to this yet? Clearly, the people who receive commission from the providers will claim that the investment management is extremely good, but, in reality, the management will not be good for all trusts.

I did some experiments with charging structures some years ago, which were published in 1986 (*J.I.A.S.S.* **29,** 25-51). Was it a good idea to base the charges as a percentage of the assets or as a percentage of the dividend income? Since I tend to look at it as a percentage of the dividend income (for investment trusts it is typically 10% or so of the dividend income, which is much better value), might it not be more stable for the unit trust managers to make the charges a percentage of the dividend income? Quite apart from the fact that the public might then notice that the charges were extremely high, because 25% of the income looks a lot more than 1% of the assets, I found that there were other advantages in charging as a percentage of the assets. I assumed that expenses rose in line with inflation, and that inflation, dividends and assets were all according to my then stochastic investment model. What happened was that the charges were either higher than the expenses or lower than the expenses — that is that the distribution of charges versus expenses was U-shaped and settled out to one side or the other, if the charge was a percentage of dividends. The reason is that dividends tend either to run in advance of retail prices for a long time or to run below them for a long time. So, charging on the basis of dividends was likely either to be very profitable or to be very unprofitable. Charging on the basis of the asset values, which fluctuate up and down much more, averaged out very much better. It was an interesting experiment and an interesting example of using simulation methods to discover something that I did not know.

Single pricing seems a complete misnomer. I do not know any management group that is going into the market with bid and offer prices the same. There are bound to be two different prices: a bid price and an offer price. The question is how do you calculate them. Do you quote them on the basis of a price with a percentage loading or as just a bid price and an offer price? The authors have shown that using middle market prices is simply not fair to the other unit holders if you are either creating or abolishing units. The actuarial profession in this country ought to be saying firmly that this concept of single pricing on a basis of middle market price is a bad method, and the fact that other countries use it shows that they are all out of step except us.

One should be very careful with embedded value or goodwill, particularly with unit trusts, as opposed to life business. There is a higher chance of confidence in the unit trust industry or in a particular unit trust management group being lost, and there is a much larger than expected number of withdrawals, or repurchases or surrenders. Traditional life insurance business is not so vulnerable, because surrender values can be designed to be fairly low. If there were a great rush of surrenders, life offices could make a small profit out of it, so embedded values in that context are not too ambitious. It is also quite right to look at embedded values and goodwill for transfers of a business from one company to another, but for reported profits it is much safer to use profits that have actually been earned rather than profits that you are hoping to earn at some time in the future.

Mr C. J. Hitchen, F.I.A.: Professor Wilkie said that unit trust charges are clearly far too high, and therefore they are very bad value. However, the key aspect is that people buy unit trusts for reasons of diversification, which the average member of the public cannot get by investing in individual shares — at least not as easily.

Perhaps a parallel line of argument to Professor Wilkie's is whether it is worth paying more than $\frac{1}{2}\%$ for active unit trust management if you can get a tracker for $\frac{1}{2}\%$. We all still hope that we can pick a good manager and get the 1% back.

Regarding Professor Wilkie's suggestion that charges should be calculated as a percentage of dividends, does that not mean that growth funds become intrinsically cheaper than income funds? One result of charging according to assets under management is that if you perform well and the fund under management grows there is more money, so there is some element of reward there.

I agree with what was said about single pricing. Dual pricing is much fairer regarding balancing the needs of buyers and sellers. What is becoming clear with regard to OEICs is that people do not understand how they work.

Mr T. Miller (a visitor)**:** My interest is in unit trust management companies, and I will speak in defence of unit trusts, after hearing what Professor Wilkie has said.

His first statement was that there are more unit trusts than shares in the All-Share Index. I do not see why this is strange. There are more books in the British Library than words in the Oxford English Dictionary, but that does not mean anything. The All-Share Index does not contain all the shares that you can invest in. You can invest in every quoted company in the world through unit trusts. That is a very large number of shares, and there are many different ways of arranging those shares.

So why do people invest in unit trusts? One of the reasons is the principle of diversification that Mr Hitchen spoke about. There is another reason, which is linked with the charging question; that is that ordinary people cannot just go and buy shares. Investing £100 a month or investing a £2,000 lump sum is expensive as well as risky, and not possible through a savings plan — you can spend £2,000 on one share. If you try to have any kind of diversification, investing becomes prohibitively expensive.

For ordinary people there is no option: a decent stake in equities requires the use of a collective vehicle of some kind; either a unit trust, an investment trust or a life insurance policy.

The rich can buy large numbers of shares quite cheaply, but may be better off by investing through unit trusts because it is so much simpler. The tax returns are simpler. Your investment can be valued every single day. You do not have to employ somebody to invest for you. Most rich people employ people, but they do not have to. They can do it through a unit trust in a very straightforward and economical way.

There are other reasons why unit trusts are a good idea and why, for many people, they are preferable to investing directly in shares. Professor Wilkie said the charges are high. He quoted a $1\frac{1}{2}\%$ charge as being 40% of the average yield on the All-Share Index, but you are not expecting a return of just income, you are also expecting capital growth.

There is something in what Professor Wilkie says, however, because, ever since unit trust charges were de-regulated in 1979, they have crept upwards. Before 1979 you were allowed to add up your charges in percentage points over 20 years, and they were not allowed to exceed $13\frac{1}{4}\%$ points. That gave you the classic charging structure of a $3\frac{1}{4}\%$ initial charge and a $\frac{1}{2}\%$ annual charge. Now the classic charging structure is something like 6% initial and $1\frac{1}{4}\%$ annual, so unit trust charges have actually tripled during this period. At the same time, the minimum investments required have increased. In the 1970s and earlier, you could invest minute amounts in unit trusts. Perhaps there was something extraordinarily efficient about the manual systems that were being used then as compared with the extremely expensive and possibly labour intensive computerised systems that we have today! It is certainly the case that the regulatory requirements that unit trust managers have to observe are very labour intensive indeed, but unit trust prices have gone up too much.

One of the things that has driven prices up has been the demand by IFAs for commission. Currently the demand is for renewal commission. It is quite clear that if you have a unit trust with an annual charge of 1%, you cannot pay $\frac{1}{2}\%$ renewal. You have to put up your charge to $1\frac{1}{2}\%$. You can do it through a PEP without people noticing very much, but there is now enormous pressure on all unit trust managers, especially the large ones, to start giving renewal commission on their ordinary business.

Controls on unit trust prices and controls on unit trust commissions could focus competition on the

performance and the quality of service. As it is, competition has been focused, inappropriately, on the size of the commission that an IFA gets for recommending the product.

On the question of single pricing, what escapes people is that, even though there is some unfairness as people come in and as people go out, every single person has to go through the whole cycle. Everybody who buys a unit trust is a buyer, is a continuing unit trust holder, and has to come out, if only by reason of death. From the point of view of the customer it is simpler. Bid prices and offer prices are complicated, and are certainly off-putting to the customer, as confirmed by market research.

The paper is one of the best summaries of what unit trusts are all about. The only thing missing is some explanation of how embedded values are actually calculated. I have spent much time trying to work out how much unit trust management companies are worth.

Mr R. E. Brimblecombe, C.B.E., F.I.A.: As Chairman of the Wider Fields Board, I congratulate the working party in producing such a comprehensive paper, particularly in the area of financial management of unit trust management companies. This is a role which actuaries can increasingly get involved in and add value to companies, using techniques that are similar to those used in relation to life assurance companies.

The paper starts to address another issue which is important for the actuarial profession, and that is to aid public understanding of unit trusts and, in particular, the differences between unit trust investment and unit-linked insurance products. Perhaps, at some stage, this working party or another could expand this area.

The Wider Fields Board has recently set up a committee, the Personal Financial Planning Committee, which is looking at ways in which the actuarial profession can add to public understanding as well as assisting actuaries who are involved in personal financial planning themselves.

There are many areas where there are differences between unit trust and unit-linked products. I feel that very few of them are addressed by IFAs, in particular, although they have a duty to do so under the Financial Services Act.

One of the major differences is the question of commission — the fact that higher commission is usually paid on single premium life bonds compared with lump sum investments in unit trusts. Another area is that, as the paper says, there has been relatively little business done on regular saving unit trust savings schemes, which I believe are ideal for many of the public, because of the advantages of average pricing, for a start. The reason why they have not been so successful may be the commission.

A further area that I find surprising is why the majority of personal pensions sold are insurance products rather than unit trusts, which can compare favourably with unit-linked pensions products.

There are other issues where there are differences. For example, where unit-linked life funds invest in the unit trusts of the same insurance group, quite often there has been some element of double charging. As far as the individual is concerned, the insurance company pays capital gains tax on all its investments under unit-linked life products. It can defer payment of some of the capital gains tax, and that is reflected in the capital gains deductions from unit-linked funds. Nevertheless, it is there, whereas under unit trusts the majority of people can take advantage of indexation and of the annual exemption.

There is much in the paper about the expense charges of the various unit trusts. How often are these explained to potential investors compared with the expenses on insurance products?

These are a couple of areas where the profession could add value by assisting intermediaries and others in giving more information to the public.

Like Professor Wilkie and others, I find that single pricing is a very difficult concept to comprehend. Nevertheless, as Mr Miller has said, dual pricing is the most disliked element of unit trusts so far as the public are concerned. The public always feel aggrieved about the 5% spread, or whatever it is, and take little notice of the actual initial investment and renewal charges.

The investment strategy of unit trust managers, demonstrated in Figure 1, is interesting. It indicates that slightly under 50% of holdings in unit trusts are still institutional. How do investment managers cope with the different needs of the institutional investors on the one hand and the requirements of a

wide range of retail investors on the other? Even among the retail investors there are smaller investors who should rightly purchase unit trusts for the spread of risk, which is necessary on the one hand, and there are those who are looking for unit trusts in specialist investment areas (e.g. high net worth individuals) on the other hand. Investment strategy and pricing structures should be totally different as between them. Investment managers of unit trust companies face the same dilemma as the investment departments of large insurance companies who invest huge amounts of life and, sometimes, general insurance funds, and, at the same time, are trying to meet the widely different needs of their retail client base for life and pensions products.

Mr N. B. Masters, F.I.A.: Based on my experience of developing new products in these areas, my view is that actuarial involvement in unit trusts, investment trusts and OEICs will grow. While the theory of cash flow projection is understood by investment companies, they are not familiar with the practical discipline which profit testing imposes. However, they quickly recognise that profit testing techniques are invaluable in establishing proper pricing levels — even if pointing out that certain contract terms will lose money is not always welcomed in the first instance.

My experience is that current charging structures require using high average premiums to break-even at 15% p.a., and even then the payback periods can last 8 or 9 years. The only justification is to assume high levels of resale to existing clients. With such marginal pricing bases, there is clearly a need for pricing discipline.

Actuarial techniques are important for assessing product structures such as money purchase schemes or group PEPs, where margins over the period of the contract vary from year to year. These are areas which many investment managers are now considering, and the assistance of an actuary is essential.

Although actuarial techniques are useful, actuaries can make a more important contribution by providing a framework within which useful management information can be collected and monitored. Actuaries have made such a contribution to general insurance over the last decade, and it will be of equal benefit to the investment management industry.

The structure might be based either on embedded value or achieved profits — the important point is that a coherent system of shareholder value monitors the progress of the group. I prefer the margining approach of achieved profits, as it addresses extra risk directly rather than in a rule-of-thumb way that risk discount rates can.

I now give some words of caution:

(1) I reiterate the point that various financial reporting methods for life offices are still being developed. It will be a long time before the methods and the information on which they are based are well-enough understood to avoid unexpected fluctuations in results from year to year, and hence can be allowed to be included in primary financial statements. Embedded value reporting in Company Act Accounts is still in its infancy, and much experience needs to be gained before other industries can adopt it reliably. I stress that I am referring here to external reporting, not internal reporting. In the latter case, management information based on embedded values is essential.

(2) We must avoid overselling the objectivity of the techniques. The paper is somewhat dismissive of the traditional multiplier, but then goes on, in ¶3.4.6.2, to adopt a '$7\frac{1}{2}$ times' multiplier to reach the appraisal value, without admitting either that the 17% p.a. discount rate was a rule-of-thumb choice or that valuing dividend streams as perpetuities ignores the need to reinvest capital into a business as its infrastructure becomes outdated. The $7\frac{1}{2}$ times multiplier is another rule-of-thumb — it is just used in a more specific context.

Mr P. G. Scott, F.I.A.: The unit trust/OEICs/PEPs/mutual funds industry is going through substantial change at the present time; change which is driving down the margins and leading to highly volatile business performance. Those margin reductions and the volatility lead to the need for better financial tools, some of which are outlined in this paper.

Mr Miller mentioned the impact of commission drivers and how it would be more effective to have an industry where there was a maximum commissions agreement. Those of us who have spent our

careers in the life industry will have said the same thing many times, but, regrettably, competition policy today says that we cannot have restrictions in that area.

If we do not have maximum commission agreements, the industry needs to be controlled in other ways; to do that, we need disclosure. We have disclosure in the sense of disclosure to the customer, currently being developed, and it is to be hoped that this will produce the appropriate 'level playing field'. We also need to have disclosure to the proprietors of these mutual fund type companies. I have had some experience of trying to explain to a new entrant to the market the importance of effective pricing and effective financial management. Regrettably, not everyone coming into this industry sees the world through actuarial eyes. Is the company interested in the return on capital employed or is it more interested in the cheapest prices in the industry? In that situation, one needs to try to identify very clearly what the company's objectives are and to try to produce the financial results to help clarify what is happening in the business.

For actuaries to be successful in this field, we must communicate effectively. Probably the biggest disadvantage we have is the phrase 'embedded value' — it means nothing to most actuaries. Perhaps we need to try to use terms like 'customer value', or perhaps embedded value is a version of customer lifetime value. If we can communicate the actuarial techniques effectively, we can influence the industry in the way described.

Mr M. H. Field, C.B.E., F.I.A.: I was glad to hear the opener and Mr Brimblecombe refer to guidance to the public on investment performance. The public need such guidance. I have debated the issue a number of times over the past 10 years and have often been told that one cannot foretell the future. Indeed one cannot, but it must be possible to say something, for example, that a fund of that characteristic and that stated object has a likely outcome which differs from another one which is more stable or less stable. The public needs help, but all they receive at the moment is up-to-the-minute information. Up-to-the-minute information is actually misleading, because it has too much of the current minute in it.

Mr Miller made a point in reply to Professor Wilkie on the level at which it was economic to have a private portfolio of investments. I faced such a situation on my first retirement when I had actually some money to invest. Since then the fund has increased as life assurance policies have matured and property has been sold. I have noticed, in arguments with my stockbroker, that he consistently maintains that the economic level is about half the amount of the portfolio, whereas I consider it to be about twice the level.

On the disclosure of life assurance and unit trust products, I do not share the OFT view. The unit trust regime and unit trust products deserve a lighter regime than life assurance products, as proposed by the PIA. I should like to see this extended. If a life assurance company can produce a product that is as simple to describe and understand as a unit trust product and has no surrender penalties at all, then the life assurance company should be able to use the lighter disclosure regime. That would benefit the company and, through lower costs, would benefit policyholders as well.

Mr S. Jeffrey (a visitor)**:** My background is accounting. For the past few years I have specialised in the fund management industry, providing accounting and auditing services, and doing some work on due diligence and acquisitions. This has included the valuation of funds and the valuation of fund management companies. I found this a very useful and helpful paper.

I was particularly interested in the inter-play between accounting standards and embedded value accounting and the commercial reality of the pricing of many acquisitions taking place in the fund management industry at the moment. This is where actuaries can be of particular help.

The Accounting Standards Board (ASB) is moving financial reporting towards value-based reporting. The trend is likely to be increasingly for the balance sheet and the supplementary information to be statements of fair values, and we are seeing that already in the context of acquisitions.

Recent acquisitions have taken place at some quite surprising prices. For example, Dunedin was acquired for £83m, which was about $1\frac{3}{4}\%$ of funds under management, which, at that stage, were about £4.8bn, while Jupiter International was acquired at about twice that price, at about £174m for

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a book of business which represented only about 80% of the Dunedin size. So the price factor was about 2½ times the ratio that was applied for Dunedin. You have to take into account cash and a number of other factors. Market pricing is based on market forces, not least of which is the appetite of the acquirer. We have seen a number of continental European institutions, like German banks, demonstrate that they are prepared to pay quite generously for strategic positions in the industry.

In other situations, I have found among my client base that predators experience great difficulty in being able to estimate the probable worth of the book of funds that they are seeking to acquire. They have to consider complexities of the load structure, the charging structure, the average life of an investment, the mix of funds under the control of the target and the expenses of running the business. The methodology that may come through from embedded accounting, if we did understand it, would provide a useful structure to help make some of these acquisition decisions.

Increasingly as well, the ASB is going to require that the premium paid over the net assets of the underlying business acquired is to be analysed and valued separately on the balance sheet of the company making the acquisition. Although I am not necessarily persuaded that embedded values should be brought onto the balance sheet, I think that there are two advantageous consequences of reporting embedded value type information.

The first advantage is that acquirers will be presented with a measure of value consistently, and, it is to be hoped, objectively determined with reference to consistent benchmarks. This will tend to narrow the range of prices that we see on acquisitions.

The second advantage will be that the readers of the accounts will be better informed on the intrinsic value of the underlying business beneath the financial statements that they are reading. This is going to become increasingly important as the fund management business moves into an area which is very difficult to assess — and that is the area of money purchase schemes and defined contribution products.

Mr P. J. Nowell, F.I.A.: One of the interesting things about the phenomenon of the general public buying at the top and selling at the bottom is that it probably gives a chance for investment managers and the professionals to outperform just by buying those shares. Sadly, the amount that the individual public buy is not sufficient to make this significant.

I was involved in trying to apply usual actuarial techniques to unit trust business. We wanted to look at persistency; when a unit trust is bought, for how long is it held and is there any persisting effect depending on whether it is held for one year, two years or three years? Because of the lesser penalties on early withdrawal, maybe the duration effect is different for unit trusts compared with life assurance. Our problem was that we were not sure where the information came from. We did not keep records on the computer of when people bought and realised units. Apparently, a number of companies do not keep those records.

So far as the unit trust is concerned, all it is interested in is how many units the person has. The individual can work out his or her tax liability from information given, but that information is not necessarily kept for the traditional unit trust (or was not at the time we were looking), and therefore they did not keep it. In terms of applying actuarial techniques, one of the practical things that we can do, to the extent that we are associated with unit trusts, is to ask people to keep records in order to capture the information and store it against the time when it would be used.

One of my first jobs was to fill in some large, complicated forms, basically to justify the discount or otherwise on investment trusts. It was a fascinating technique, once I began to understand the numbers that I was using and what they were about. It was interesting to take the change in market value of the investment trust and compare it with the change in value of everything that can affect it, by using indices or market yields. The management charge was dealt with quite effectively by valuing it as an annuity for the future, and that got deducted from the value of the company.

Equally, one looked at the performance record of the investment manager — that is, what value he was adding — and quite often over the previous 5 years that was something that was negative, so one reduced the value of the assets by the amount that he was going to underperform in the future. It does sometimes happen the other way round!

With simple things like valuing borrowings at market yields, a whole series of adjustments led to

a theoretical value of each investment trust. By putting them all onto a common year end, you could compare and contrast and try to pick the ones which were historically cheap. I am not aware that this approach has ever been published. It might be the subject of an interesting paper in the same field, explaining discounts on investment trusts. The method could be applied around the issue about how much you really are being charged when you make all these charges in PEPs and unit trusts.

Mr A. J. Oddie, F.I.A.: Mr Wright asked how the industry used to make the box profits that it cannot make these days. It is quite simple. Suppose you have a company that calculated its unit prices at about 12 noon each day. It would then deal with the public at that historic price, calculated at that time, for the rest of the day. On the following morning, at about 10.30, say, when it added up all the purchases and subtracted all the redemptions, it would decide how many units it wanted to create at the previous day's price. If the stock market had opened 20 points higher, it would buy additional units and allocate those to its own account. Equally, if the stock market had opened a lot lower, it would create fewer units than theoretically required and run a short position. The profits would come out of the fund for the managers' account. That sort of practice is no longer permitted.

Mr Miller lamented the fact that charges are much higher now than they used to be. That is the case. Part of the reason for that, which he discussed, is that expenses are so much higher now, whether on computer systems, regulation, extra commission or whatever. Also, there is the fact that box profits can no longer be taken, which was a hidden charge made by fund managers. There used to be another hidden charge, the so-called roundings. If you calculated the unit trust price and the answer came out as 103.36, you could, in the bad old days, round that by up to 1%. So, although an actuary would round 103.36 and produce an answer 103.4, fund managers would round 103.36 and produce an answer of 104.3. That, again, gave fund managers a substantial extra charge which, although disclosed in the literature, was not understood by the public. This practice has also been banned.

Two speakers have made the point that they think that the charges on a PEP wipe out the tax advantages, but I do not think that they have made the right comparison. As Mr Miller said, the comparison is not between somebody buying a PEP and somebody investing directly in shares themselves, which I think is implicitly what those speakers are saying. As Mr Miller said, most people cannot sensibly invest in shares directly.

The comparison you should make, since nearly all PEPs are invested in unit trusts these days, is between the charges on a PEP and those on a unit trust. For most companies these are the same. When you are buying a PEP, therefore, you are not paying any extra charges at all, because the charges on the underlying unit trust, which is how most people would otherwise be buying shares, are there anyway.

Mr T. Guinness (a visitor)**:** It seems to me that the embedded value approach is basically a lot less conservative than the conventional method of accounting. I notice that, in investment companies' accounts, their profits, when computed using conventional methodology, throw up earnings that are then valued in the market at about 15-20 times, like industrial companies, so that they may not actually be so bad a real measure of profitability.

On the single pricing debate, no-one has mentioned that you get concentration, potentially, as well as dilution. Dual pricing is unfair to the active manager of assets, because on any one dealing day, if there are both buyers and sellers, part of the cost of rearranging the portfolio does not arise, and the profit actually goes to the manager.

One company did a study of this, and showed that who benefited depended on the amount of the ratio of buyers and sellers over time. It is self serving of the industry to argue that the passive investor deserves better treatment than the active manager. I am in Mr Miller's camp — I think that single pricing would actually work in practice.

On the comments that have been made on pricing, Professor Wilkie argued very strongly that unit trust prices were exorbitant. I have two contradictory comments on that. First, not all groups charge 6% front end and $1\frac{1}{2}$% p.a. renewal charges. My firm has some trusts where we have no load as our front end charge, no exit charges, and only charge 0.65% p.a. That is on our corporate bond PEP. We

consider that that is the appropriate pricing for that sort of unit trust. We charge 2% front end and $1\frac{1}{2}$% p.a. renewal on a £6,000 investment in a PEP; but it is worth remembering that, in addition to the diversification benefit, you get reporting, investment skill and accounting. One should not underestimate the hidden cost to the individual investor of doing the accounting for his or her investments. You have capital gains tax shelter on switching if you are in that situation, and you have someone doing the tax reclaim for you. All that for a £6,000 investment costs you £90 a year. It is not, in absolute terms, a significant amount.

Mr R. J. Squires, F.I.A.: I joined a unit trust management company, which was then the largest in the industry, in 1969 and was there for 20 years. It is no longer the largest in the industry, so I know something about the difficulties of running a mature unit trust management company. In times when marketing new products is easy, it is tempting for people to come in with new products, look at the margins that they are going to make during the launch period, when all the front end loads are coming in, and not worry about the annual charges. Then you get to a point where your income starts to flatten off, and you still have all these bright young marketing people around, who want more money, so you launch a new trust.

Eventually you get to the point where it begins to be difficult to think of new developing industries, smaller companies and so on, and you start getting more repurchases as your competitors launch exciting new trusts. The question which is interesting to us is the repurchase rate. That is the key factor in putting any kind of embedded value on your operation.

In the early days the information was not available as to when people repurchased, but it was not felt to be necessary because it was always 6% p.a. It was one of the few great actuarial constants. This constant has changed over the years, and I do not know what the current position is, but currently the overall repurchase rate for unit trusts is likely to be significantly higher than 6%. That, combined with the higher commission that is now necessary to pay IFAs to get the units sold in the first place, must be fairly serious for the profitability of unit trust management companies.

Mr J. Goford, F.I.A.: I did one of my usual tests on this paper and looked for the word 'customer'. I found it tucked away in Section 2.2 under *Operating environment.* He is dismissed, as there is apparently no typical unit trust customer, and therefore we do not need to think about him any more! I would have liked to have seen, in the paper, some thought as to how these products fit customer needs, and certainly in accumulation products these broadly fit into two — on the one hand the provision for specific future needs, like repaying a mortgage, retirement, school fees, and so on; and on the other hand a completely separate driven need, which is long-term savings or the accumulation of excess net disposable income.

It is interesting, when looking at the marketing materials of such products, whether they be life assurance products or unit trust products, to see if there is a very clear understanding that there are these two very different needs of customers — one driven by provisions for future events, and the other driven by excess cash in the pocket. In papers like this, I should like to see how these products are researched to fit customer needs better, and, in particular, with regard to volatility, the sort of terms for which it is appropriate to recommend these products, the importance of lack of guarantees, and what additional amount the customer might expect to get because there are no guarantees, say, compared with a with-profits product.

It is nice to see the control cycle reappearing. As we bring actuarial skills to this industry, I hope that we do not concentrate on products, but also think about customers' needs.

There was a warning from Mr Oddie on what you should not do with box management. I recall that box management profits used to be called quality profits, because they were so predictable and they were done every day. I hope that that lesson is also learnt in unit-linked pricing in the life assurance industry, that generated box management profits are unacceptable.

Mr M. R. Kipling, F.I.A.: As Chairman of the Life Board Regulation Committee, this afternoon I represented the Life Board at one of our regular meetings with the PIA. While the majority of our

discussions focused on life business, we discussed some matters relating to disclosure, and I shall briefly mention them:

(1) We had responded some months ago to the PIA's discussion paper on 'Unit Trust Disclosure', and our main comment was that we felt it was appropriate for there to be a level playing field between unit trust products and life products. We were quite careful in our response not to indicate where we thought the level playing field ought to lie, either in the unit trust form of disclosure mooted or in the life insurance form of disclosure, although, in particular, we did want expenses to be comparable. While I sympathise with Mr Field's view that there could possibly be a simpler form of disclosure, it is extremely difficult for a member of the public to compare any product which has even two types of charges. If there was only one possible type of completely overt charge, with even that not capable of being varied in the future, maybe we could have a simpler regime. So long as there is a combination of initial charge and ongoing annual charge, it is very difficult to compare the two. We therefore support some form of consistent approach.

(2) We felt that it might be appropriate for there to be a different disclosure regime, depending upon the method of distribution used for the product. We certainly felt that unit trusts, in particular, were often bought rather than sold. There were many people who traded unit trusts in large quantities on essentially an execution-only basis. In such circumstances, we felt that there was reasonable scope for there to be much lighter disclosure, possibly only at the request of the customer, so that the products could be traded rather like equities, which, of course, come without any form of disclosure. When the products were sold, either off the page or via a sales person, it seemed more appropriate for the disclosure regime to be roughly in line — and where it comes to numerical amounts, exactly in line — with that which would apply to life insurance.

We also briefly discussed the question that Mr Brimblecombe raised regarding risk rating. That was something that we had raised with the PIA, and on which the PIA had expressed some interest in the past. We considered two angles, the first of which was the type of risk involved in the investment. However, rather than different types of unit-linked investment, we were looking at, for example, how one would grade with-profits against managed funds.

It is an issue which it would be well worth the new Personal Financial Planning Committee having a look at. To me it is by no means clear that with-profits funds have pay-outs which are any less volatile than managed funds. In certain circumstances, they could conceivably be more volatile, if only because their control depends very much upon the discretion of the management of the company and not upon purely external features, such as movements in the market.

The second area of risk, in which actuarial work could usefully be done in the future, relates to various claims made in the description of certain products, particularly investment-linked products. For example, "This product will give you your money back if the stock market grows by 25% over a certain period", or "We will give you your money back if our funds earn *x*% p.a. over a certain period".

There is, perhaps, some possibility that one can, having considered the results of a reasonable stochastic model, say, convey to the public, in words of one syllable, the probability of getting their money back. For example, that it is quite probable that the stock market will grow by 25% over 5 years, but that it is very unlikely that it would do so over 1 year; or again, that it is fairly unlikely that someone will earn 15% p.a. gross for 5 years, based on current market conditions, but reasonable that they will earn 8% p.a. gross over 5 years.

These are areas where, if we can devise an accepted standard to make comparisons against, and a simple way in which to express them to the public, we can add to the comprehension of these products to the benefit of all of us in the market who sell them.

The President (Mr C. D. Daykin, C.B., F.I.A.): I am very pleased to see the initiative which FIMAG took to establish a study in the unit trust area, and thereby to explore some of the insights which actuaries may be able to add to this particular field of activity. There are clearly a number of actuaries who have been working in unit trust groups, or groups which contain unit trust operations, for a good many years. There are also many parts of this industry where actuaries are not actively

involved, and where the application of some of the ideas from unit-linked insurance operations may be useful and beneficial.

It is interesting to see how the traditions of this market differ from those of the insurance market. Bringing the two together, comparing and reading across some of the insights from one market to the other, can undoubtedly be beneficial.

This paper has shown that actuarial thinking can contribute significantly in the field of collective investment vehicles outwith the insurance market. I hope that we will see a growth of such involvement in the future and an increase in the influence of actuaries on pricings, sound financial management, the protection of investors' interests, the reasonable expectations of investors, which might be a concept which could be exported from the insurance industry to the unit trust industry, and the profitability of these vehicles for their proprietors. The problems of sales and acquisitions have also been referred to on a number of occasions.

I should like to congratulate all the authors, and especially Mr Mehta who has chaired the working party, who brought us the paper.

Mr S. J. B. Mehta, F.I.A. (replying)**:** With regard to Mr Wright's comments on the use of a deferred acquisition cost amortisation period, my view is that the period is inherently arbitrary. One actuary could argue for spreading over the initial commission earnings period and another could argue for amortisation over the expected average life of the vehicle. Mr Marshall put forward some very valuable views from an actuary who has been involved in unit trust management covering a wide range of issues, from the need for more detailed expense analysis, the need for a reasonable sized box, difficulties of measuring relative investment performance and to distribution.

A number of the points raised by Professor Wilkie were considered in detail by Mr Hitchen and also by Mr Miller. However, the issue of whether embedded value profits are earned or not does warrant comment. The power of the embedded value method is that it recognises value created today, and does not rely on artificial accounting rules as to distributability. Nothing in this life is certain, and, when managing a company, one needs to take a reasonable view rather than rely on certainty.

Mr Masters raised issues in relation to external embedded value reporting, relating to the volatility of profits and the subjectivity of elements in the actuarial basis. Company values and shareholders' investments are volatile, and my view is that an accounting method that does not reflect this underlying fact may be providing a disservice to management and shareholders. Whether value is conservative or not depends on whether one is buying or selling. On the question of subjectivity, the paper put forward a basis for selecting the discount rate objectively, and did not apply a discount rate of 15% selected at random.

Mr Scott's reference to the need to communicate actuarial techniques effectively is well taken, and I thank Mr Field for a number of his observations, and for summarising so accurately the break-even point for unit trust versus direct investment.

Mr Jeffreys made very pertinent observations regarding the need for value-based accounting, that is embedded values. As a profession we should be open to changing the terminology, as suggested by Mr Scott, for example to DCF value, as widely used in many industries. Mr Nowell, together with a number of other speakers, referred to the lack of information currently stored by unit trust groups. This is, indeed, one of the areas where the use of DCF techniques could add value to the industry.

Mr Goford referred to the lack of emphasis on the customer. My perspective is that the unit trust industry is very good at customer focus, and, coming from a different industry, I suspect that the working party did not wish to impose our views. However, I do agree that, with the benefit of hindsight, the scope of the paper could have been extended in this respect.

I now say a few words about future possibilities for actuaries with an interest in collective investment vehicles and wider fields. The working party had two objectives in preparing the paper. The first was to pool together background information that would be of benefit to anyone wishing to gain an overview of the fiscal, regulatory and market climate in which unit trust groups operate. The second objective, corresponding to the second part of the paper, was to set out and examine various financial management issues which arise in the course of running an investment company. From the very good discussion that we have had, I believe that the objectives we set are bearing fruit, and I

hope that there can be an increasing dialogue between the actuarial profession and other professionals working in the collective investment schemes industry.

Taking my own background in the life industry as an example, it occurs to me that unit trust groups may benefit from a better understanding of some of the difficulties which life companies have been experiencing, just as the life industry may benefit from existing expertise to be found within unit trust groups.

On another positive note, the unit trust industry benefits from a tremendous and justifiable pride in their products and optimism for the future. I do hope that actuaries can play some part in helping the industry build on its success. As an example, it is perhaps not well known that the AUTIF proposals for a standard method of calculating yields for bond funds were based on work undertaken by, and reviewed by, actuaries.

There has been some discussion about the use of embedded values, that is discounted cash flow techniques. My own view is that, properly framed, this methodology has enormous applications, not just for the life and unit trust industries, but more generally within the economy at large. It would be exciting, indeed, if the profession could move towards assisting industrial as well as financial companies with their modelling needs.

WRITTEN CONTRIBUTION

The authors subsequently wrote: Mr Wright raised the interesting point that the rate of growth for the trust should be below the rate to be assumed for the investments underlying the trust, given a propensity of investors to buy at market highs and sell during troughs. We agree with this observation, but would add the further point that the riskiness of the trust could correspondingly be lower than for the underlying investments. This would result from the tendency for equity market risk to be at its highest when markets are low (high risk resulting in a high discount rate applied to future expected earnings streams, and therefore depressed values). Investors buy when market risk is low and achieve lower returns than the long-term average for the underlying investments. However, when profit-testing the lower risk and lower expected return offset each other, and the overall adjustment may not impact profitability.

Mr Marshall's point about the need for detailed expense analysis is well taken. To the extent that OEICs do emerge as a major feature of the market place, we agree that this could result in distribution changes, including the tailoring of products to different distribution methods. To some extent changes could arise in any case, for example if management companies are driven to focus on a single distribution to enhance productivity. With regard to his specific comments on IFA and sales force distribution, an interesting area for further research is the level of productivity required to support remuneration to IFAs and salesmen, given a competitive environment of product charges. How could any required productivity gains be achieved?

There is just one aspect of Mr Miller's contribution that we wish to take issue with. He argued for controls on unit trust prices and commissions. From a consumer's standpoint, there are many studies which have shown that there are very often unintended adverse effects from state price fixing and regulatory activities. Witness, for example, the huge rise in life office acquisition costs post FSA. As importantly, consumers can be lulled into a false sense of security and abandon their natural inclination to observe a *caveat emptor* principle. The case for regulation has not been proven.

Mr Brimblecombe raised a number of important issues, particularly as to differences between unit trust and unit-linked products. We agree that this would be a fruitful area for research, as would the risk rating and guarantee disclosure issues suggested by Mr Kipling.

We agree with the observation made by Mr Masters that the practical discipline imposed by profit testing is invaluable, and agree with the two examples which illustrate why this is so. With regard to the objectivity of the techniques outlined in the paper, we believe that there are good reasons to adopt the approaches to appraisal valuation set out in the paper. Not all unit trust operations are the same, and the methodology provides a way of recognising these differences in the valuation. The assessment of goodwill is, of necessity, subjective, but, if other elements of value can be quantified more

accurately, this leaves greater scope for a more precise tracking of appraisal values relative to transaction prices. The result should assist with gaining a better understanding of goodwill values. Mr Guinness suggested that companies are valued consistently in the market, at 15 to 20 times earnings, whereas Mr Jeffrey observed that there were substantial differences between different types of company. Our experience is that values do vary widely, and that closer analysis of value is fruitful.

We certainly do agree with the points made by Mr Jeffrey as to the various advantages of reporting appraisal and embedded values.

We also agree with the President's concluding remarks about both the differences between the unit-linked and unit trust markets and the benefits which can arise if insights from one market are brought to the other.