

# CONTRIBUTION N° 49

## PROFIT REPORTING AND ANALYSIS IN UNIT - LINKED LIFE INSURANCE

---

PAR / BY

Colm FAGAN

Irlande / Ireland

---

ETABLISSEMENT ET ANALYSE  
DU PROFIT DANS LES  
ASSURANCES LIEES A UNE  
UNITE DE COMPTE

## 2 ETABLISSEMENT ET ANALYSE DU PROFIT DANS LES ASSURANCES LIÉES A UNE UNITÉ DE COMPTE

COLM FAGAN, FI A., A.S. A.

### RESUME

L'article traite de la **définition** et la **mesure** du profit, en **particulier** de l'assurance - vie **liée à une unité de compte**. Les **méthodes classiques** de **détermination** du profit des **assurances - vie**, fondées sur la **solvabilité**, **présentent l'inconvénient d'indiquer une perte** lors de la vente **d'une nouvelle police, même** selon **des conditions** rentables.

On **traite** rapidement des **comptabilités** établies selon les Principes comptables **généralement acceptés** aux **Etats - Unis** (GAAP : Generally Accepted Accounting Principles) : elle **donnent** au **mieux** une estimation **neutre** du profit **lié à la vente**.

Pour **essayer** de **répondre à** la question **philosophique** de **savoir quand** il faut **admettre** l'**existence** d'un profit, on introduit le concept "**d'événement critique**", puis on examine l'**apport pratique et théorique** de la **méthode comptable** fondée sur l'application de la notion de **valeur incluse**, à une **compagnie d'assurance - vie** : elle **fournit** un cadre applicable **à presque toutes** les **méthodes de détermination** du profit.

Les **comptabilités** établies selon les **principes** de la **valeur incluse** **présentent** le risque de **surestimer** les **aspects liés à la vente** et de **sous - estimer** **liés au service**, **dans** la relation contractuelle. **L'auteur suggère** des solutions pour **fournir** aux **utilisateurs** de ce **type** de **comptabilité** des **informations** qui leur **permettraient d'évaluer** l'**ampleur** de ce risque. **Il** indique également une **réponse préférable**, à la question **philosophique** fondamentale **posée plus haut**.

# PROFIT REPORTING AND ANALYSIS IN UNIT LINKED LIFE ASSURANCE

3

BY COLM FAGAN, FIA ASA.

(PRESENTED TO THE SOCIETY OF ACTUARIES IN IRELAND ON 19 APRIL 1989).

"I guess I should warn you, if I turn out to be particularly clear, you have probably misunderstood what I said" - Alan Greenspan, Chairman of US Federal Reserve.

## 1 - INTRODUCTION

1 - 1 Life assurance can be a complicated business. But it is a business, not a higher art form, and normal business requirements of profit and the provision of an adequate return to shareholders on the capital they have invested apply just as they do in any other business. This paper addresses the question of satisfying **shareholders'** needs for **information** on the progress of their investment so that they can direct it and make investment decisions in a meaningful fashion.

1 - 2 **The** paper is not about actuarial valuations for solvency **purposes**. Such valuations are important in the **context** of this paper not so much because they have a significant effect on the amount of profit or on its incidence but because they determine the amount of equity that needs to be **tied** up in the business to **earn** the profit. Solvency valuations thus have a **significant** effect on the **return on** equity. We shall return to this statement later.

1 - 3 The view of life assurance as a business not unlike any other business has to be modified for with profit business, particularly where the rights of with profit policyholders to profits are not confined to their own sub - fund. This **paper** does not touch on the problems caused by with profit business but, in confining itself to consideration of unit linked business, it has not been possible to avoid completely the problem of how the delicate financial balance between the owners of the business and its customers is maintained in an equitable manner.

1 - 4 This problem exists because the **contract** wordings of modern forms of unit linked policies allow considerable **discretion** to the company in the charges it levies throughout a contract's life for mortality charges, **administration** services, **etc**.

Getting the right financial balance between the interests of the company and of its customers is more difficult in life assurance than in other **businesses** for a variety of reasons, among them being the opaque nature of charges in life assurance contracts and the high costs of entry. These make it difficult (and sometimes impossible if a person's health has become impaired) to transfer from one **carrier** to another. Ideally, a company writing such business should define and publish its policy on revision of charges. Some of the more complex philosophical issues in relation to formulation of charging policy are ignored in the paper.

1 - 5 While the paper confines itself to consideration of unit linked business, the general approach outlined applies equally to conventional non profit business. Also, while the paper is written against the background of a company writing business **only** in Ireland, it

can be **assumed** by **non-Irish** readers that the financial and legislative **background** is not significantly different from the UK in its general structure. However, there is an interesting **difference** on the "true **and** fair" requirement which will be discussed later.

1 - 6 In answer to the question as to why **the** paper was written, the simple answer is that the author was asked to do so ! However, it was a task taken on without **too** many objections **since** there is an urgent need for fuller **debate** on the nature of profit in life assurance and its reporting. It is hoped that this paper and **the** discussion of it will help to progress that debate .

1 - 7 The paper assumes some familiarity with much of the **work** that **has** been done already in this field in recent years. In particular, the paper "Recognition of Life Assurance Profits the **Embedded** Value Approach (1) as prepared by a working party of the Institute of Actuaries and presented to a Seminar on 7th November, 1988 should be read **before** reading this paper. Much of the content of that report is accepted without comment : hopefully, any areas of disagreement are noted at some stage in what follows.

1 - 8 The scheme of the paper is **as** follows :

- Section 2 looks at the question of how profit is **defined** and traces **the factors leading to the development** of Generally **Accepted** Accounting Principles (GAAP) for life assurance **companies** in **the** US and to embedded value **accounting** developments in **the** UK.
- Section 3 examines in detail the calculation of **shareholders'** funds on embedded value principles including the bases to be **adopted** for projecting **shareholders'** cash flows and for discounting those cash flows back to the valuation date.
- Section 4 moves from looking at the static balance sheet representation of **shareholders'** funds to the dynamics of profit calculations and, in particular, to analysis of **profit** into its various components.
- Section 5 examines **the** question of capital usage and the **importance** of projections of capital needs / emergence when valuing a life assurance company for purchase or sale. This section also compares the relative merits of earnings multiples **using** the analysis on **the** lines of Section 4 and **appraisal** value techniques to place a value on a life assurance company.
- Finally, in Section 6, an attempt is made to draw together the various strands of **the** discussion to date and to reach some conclusions on what steps need to be taken to ensure that accounts of life assurance companies provide meaningful and consistent information to the users of those accounts.

1 - 9 **There** is a considerable body of literature on topics **closely** related to the subject matter of this paper. The **sparing** references to other authors in the text give no hint of the vast number of articles and papers that were researched in its preparation. In an attempt to atone for failing to give credit where due for particular ideas, I have included at the end a list of references to **papers** which were not mentioned specifically in the text but which have helped considerably in preparation of this paper.

I would like to thank my friends, both actuaries and **accountants**, for their helpful comments on various drafts of **this** paper. **All** errors remaining are very much my own **fault**.

I am sure there are **errors** : if there were not, then part of the rationale for its preparation would not exist ! Finally, **the** opinions expressed are very much my own and are not necessarily **shared** by my colleagues in either the actuarial or **accounting** professions.

## 2 • DEFINING PROFIT

### **Traditional Profit** Reporting.

2 - 1 Traditionally, the life assurance industry has shied away from use of the word "profit" when referring to the operations of its business. Indeed, **the** standard **textbook** by Fisher & Young (2) for students of the life office subject in the actuarial examinations contains the following paragraph :

"Profit could only be determined when the last **survivor** of a group of contracts had gone off the books and all **claims** and expenses applicable to the group had been paid. The residue of the assets then **realised** would represent the accumulated profit in respect of that group. Normally, however, new contracts continue to enter life assurance funds, and in practice the closed position **described** would never be achieved. Moreover, periodical distributions of profit during the currency of the contracts would be required. In these more realistic circumstances, profit could only be determined if it were possible at each of the periodical distributions to estimate the future experience exactly, and to make a valuation of the liabilities on that basis. Apart from a virtuous choice, this is impossible, so that, like the premium scale, such valuation **has** to be made on an estimated basis".

The authors failed to note that similar considerations apply in every other business even though the time scale may be shorter than for life assurance. **This** has not inhibited the use of the term profit in **other** businesses. In their **defence**, Fisher and Young's book was written more than twenty years ago when the world of life assurance was very different to the way it is today.

2 - 2 The reality - in straightforward **non-technical terms** - is that the more **new** business a life assurance company writes **on** profitable terms, the **more** that company is worth. Ideally, this reality should be reflected in the accounts of the company as prepared for shareholders.

2 - 3 The normal solvency returns prepared for **supervisory** authorities do not reflect reality as defined above. **Typically**, a regular premium **policy** will generate a "loss" in solvency returns at point of sale. **This** "loss" will, of course, flow back as "profit" in due course. For more modern types of unit linked policy the pay back period may be quite short, less than two years. However, when one moves **from** considering just one policy to looking at an entire portfolio where sales are **increasing** constantly, as is the case for a new company, the pay back period for the portfolio is in years rather than months.

2 - 4 Thus, the more new business a new company writes, the more "losses" it generates on the basis of solvency returns. **If** we were influenced by such returns, the entire system would be stood on its head : **-losses** are **good** and profits (**a** lower losses) are bad, provided that the source of such losses is new business generation.

### Pressures for change.

2 - 5 While management of life assurance companies might well appreciate the subtleties of when losses are good **and** when they are not good, management whose experience will have been in other industries will look for definitions of profit and loss which conform more reasonably with **their** own experience and expectations. Thus, their **growth** in conglomerates with a range of business activities across different sectors of financial services and industry generally **has** been a major force for change in life **assurance** accounting.

Group senior management of such conglomerates **will** wish to **compare** all businesses undertaken by the Group on consistent principles. Historic methods of reporting the financial results of life assurance companies have not **satisfied** this requirement.

2 - 6 The growth in the number of purely proprietary life assurance companies and the increasing numbers of takeovers and mergers have also contributed to increasing dissatisfaction with variations of solvency returns for reporting to shareholders. This dissatisfaction is often expressed by financial analysts who find it **difficult** to compare the investment merits of different life companies with each other or with companies in other sectors of the stock market.

2 - 7 Recent discussions, associated in part with moves towards European harmonisation, which have tried to address the question of whether accounts of life assurance companies should give a **true** and fair view of the activities of the company, cannot be ignored either. In the **UK**, life assurance companies are explicitly excluded from the **true** and fair provisions of Companies Act legislation. It is interesting to note that, while accounts of life assurance companies in Ireland are prepared **on** similar bases to the **UK**, there is no corresponding exemption from true and fair requirements although the addition of **the** clause "as appropriate to life assurance companies" may allow a more liberal interpretation of the words "true" and "fair".

### US GAAP.

2 - 8 The question **of** how to **account** for life assurance companies has **been** debated very fully in the United States and comprehensive Generally Accepted Accounting Principles (GAAP) have been enunciated for financial reporting (as opposed to solvency reporting) of life assurance operations in the United States. For a comprehensive review of GAAP from an actuary's perspective, the **reader** is referred to **Credon** (3).

There is no great enthusiasm among actuaries, **or** among accountants for that **matter**, for application of GAAP financial reporting on this side of the Atlantic. Some of the weaknesses of US style GAAP include :

- a) The system is based partly on release **from** risk principles which have little significance in the context of a modern unit linked **office** which transfers most of the risk to **its** policyholders.
- b) Only the variable expenses incurred at time of sale can be capitalised in accounts. Thus, the sale of a policy still results in a **loss** in financial reports. In relation to the

**capitalisation** of variable costs, an interesting **corollary** is that GAAP bears less heavily on a broker office than on a direct selling **office** because the **proportion** of initial expenses which can be deferred in the **accounts** is higher.

- c) It treats life assurance as a form of **instalment** sale where the profit emerges as a constant proportion of premium (subject to release from risk principles).

2 - 9 Point (c) above leads to a **philosophical** question which lies at the heart of the debate on profit recognition. A life assurance contract has sales and service aspects, both of which should be **recognised** appropriately in accounting. GAAP awards no importance in profit terms to the sale aspect of the transaction. Is this "appropriate recognition", bearing in mind the importance which life assurance companies attach to the sale, as judged by the way introducing agents and intermediaries are remunerated and by the way growth in new business is trumpeted? **If** new business is so important and if it does add value to the company, should not this added value be **recognised** in some way immediately?

The critical event.

2 - 10 Accounting theory associates the recognition of revenue with the occurrence of the "critical event". See Underdown and Taylor (4) and Myers (5) for a fuller discussion of this concept. The **literature** provides guidelines as to when the critical event might occur as follows:

- 1) When **the** earning activities undertaken to create revenue have been substantially completed.
- 2) When revenue is measurable.
- 3) When the **costs** incurred in the **generation** of revenue can be measured or estimated **with** reasonable accuracy.
- 4) When the eventual collection of cash can be reasonably assured.

**The** value of these guidelines in **the** context of **the** present discussion is questionable in view of the fact that life **assurance** accounting in the broad **sense** of the word (**i.e.** financial **reporting**) always involves a forward view.

Thus, revenue is measurable on certain **assumptions** about future persistency, mortality etc. immediately a **contract** is issued. Revenue and costs can also be estimated or measured at various other times, both before and after the **contract** is issued: - when the policy terminates, when a premium is **received**, when the proposal form is received originally, when an agent is recruited; all of **these** events can be claimed, with varying degrees of credibility, to be "critical events" for the purposes of profit recognition. But can revenue and costs be estimated "with reasonable accuracy" as the above guidelines stipulate?

2 - 11 This question cannot be **divorced** from the concept of a basis which, as noted by Benjamin (6), is **fundamental** to actuarial work and appears in almost every actuarial sentence. The reasonableness of an estimate must always be measured by **reference** to an underlying basis, by the **stability** of the experience assumptions underlying the basis and by the sensitivity of the result to changes in those **assumptions**.

2 - 12 However, **the premium rate** on which a policy is sold is calculated on a **basis** which incorporates **assumptions** about all items of revenue and expense which will be incurred (or have **been incurred prior** to sale) in relation to that policy. The **reasonableness** and sensitivities **of** those assumptions are constantly **being tested by reference** to actual and possible variations in each of the parameters underlying **the basis**.

**Furthermore, the** sale of the policy is the start of a long term contractual relationship and formal returns to supervisory authorities and internal valuations must take full cognizance **of** all future revenues and **costs** associated with that contractual relationship. Thus, the sale of a policy and **the commencement of the contractual** relationship with the Insured can be deemed to qualify as a "critical event" for the purposes of profit recognition.

### **Embedded value accounting.**

2 - 13 Explicit or implicit consideration of **the** factors outlined above have contributed to **the** growing adoption of embedded value accounting. The paradox of a loss being incurred when a policy is written on profitable terms is overcome by adding to shareholders' funds in the balance sheet a non - distributable reserve equal to the discounted value of the margins that will emerge in future from the long term fund on certain assumptions regarding future experience for policies in force at the balance sheet date.

Embedded value accounting is well established for management reporting, particularly in unit **linked companies**.

Management want to be able to say to **the** directors: "By our activities this month, year, or whatever, we added **£X** to **the** value of the company". This **£X** will be equal to **the** change in **the** profit and loss account (probably a negative change in **the** case of a fast growing company) plus the change in **the** non - distributable **reserve** (ignoring changes of a capital **nature**).

2 - 14 Disclosure of embedded values in published accounts is a more recent **phenomenon** and is still at a primitive stage in that methods of presentation and attitudes towards disclosure **of** bases are in a constant state of development. Until very recently, the **life assurance companies** which showed embedded values all seemed to show **the** change in embedded value **as a movement** in reserves while the change in the profit and loss account represented movements to and from the long term fund. For parents of such life **assurance companies**, the earlier accounting treatment was similar to that for the life assurance companies themselves while **more** recently there has been **an** increase in the number of parent companies which are showing the change in **non** distributable reserve directly in **the group profit** and loss account. The main reason for this difference in **treatment** seems to be that the **accounts** of the life **assurance** company itself can be compared with other life assurance companies on similar principles but **the accounts** of the parent **company** should apply broadly consistent principles in showing profits from different activities of the group. Taxation may also be a **factor** leading to this **treatment**. Neither of **these** reasons for inconsistencies in **approach** are sustainable in the long term.



2 - 15 Embedded value accounting techniques provide a **framework** which allows a more flexible approach to be taken to the philosophical **question** of how much profit should be **recognised** at various points in the life of a contract of insurance. This flexibility is both a strength and a **weakness** : - a strength in that it is **possible** to change the weighting for sale and **service** in the recognition of **profit** by a simple change in **one** or two assumptions in the basis underlying the embedded value calculation ; a weakness in that, without **adequate disclosure** of the effects of various **assumptions**, misleading messages can be conveyed about the profitability of a company's operations.

The philosophical approach to profit recognition and the ways in which adequate disclosure can be achieved **will** be taken up again at a later stage. However, **the** next section considers some **of** the **technical** issues associated with calculation of embedded values and discusses the various assumptions underlying the basis. In the process, some of the philosophical issues will surface again against the background of **hying** to set assumptions f a particularelements of the basis.

### 3 - VALUING THE SHAREHOLDERS' INTEREST

#### Shareholders' Funds

3 - 1 In the balance sheet of a company which adopts embedded value accounting shareholders' funds **consist** of :

- a) Share capital.
- b) Balance in profit and loss account.
- c) Non distributable reserve consisting of the discounted present value of future margins to emerge from the long term fund.

The calculation of **items** a) and b) is **straightforward** but it should be noted that certain assets (computers, cars, **etc.**) **may** be valued differently in shareholder **accounts** than in returns to the supervisory authorities.

The main focus of attention in this section is on c), the value of margins which will emerge in future from the long term fund in **respect** of business in force at the valuation date.

#### Special reserves in long term fund.

3 - 2 Included in the long **term** fund will be special reserves which may not be required on an ongoing basis and which are not directly policy - related. The simplest example of such a reserve is the closed fund **run** . off reserve. This is required in solvency returns to demonstrate that, if the company were closed to new business, the margins from in force policies and the income / capital **proceeds** **from** this reserve would together be **sufficient** to meet the expenses **incurred** in running off the fund - **which** expenses **could** include the termination of service contracts for all sales and development staff. This example demonstrates probably better than any other why Companies Act **accounts** (which must be prepared on a going concern basis) should show different shareholder funds to those shown under relevant insurance legislation.

3 - 3 The question often arises as to whether or not to apply a discount factor to such reserves before adding them to shareholder funds. The **justification** for applying a discount factor is **that** the reserves cannot be released to shareholders immediately and, as **the** rate of return within the **funds** will be less than **the** shareholders' required rate of return, it is **appropriate** to discount such reserves, thus giving them a lower value **for** shareholder **purposes**. While one **cannot argue** against the **theoretical** correctness of this approach, it is much easier to tell the shareholders that such a reserve will eventually be **released** to them, but until then it will be tied up **earning** a lower rate of return than they would like. Having explained the approach taken, the reserve can then be added back at face value.

3 - 4 A similar approach can be taken to reserves for maturity guarantees, **the amount** of which will be based on ruin probabilities in solvency returns. In Companies Act accounts, it will be appropriate to add the excess of **the** reserve over expected **costs** to shareholder **funds**. Similar principles apply to reserves for a options, **AIDS, etc.**

### Reporting Actuary v Appointed Actuary.

3 - 5 Similar questions as to whether **a** not to discount arise where the reporting **actuary** (the actuary employed by the directors to advise them on the calculation of the embedded value) **considers** that a weaker basis would be used for the purposes of the solvency valuation than has actually been used by the Appointed Actuary. The **correct** procedure in those **circumstances** is to project, using embedded value assumptions, the future margins which **will** emerge relative to the solvency valuation basis as chosen by the Appointed Actuary.

This approach eliminates the undesirable possibility of the reporting actuary being expected to comment on the appropriateness or otherwise of the chosen solvency valuation basis. **A** change in the valuation basis for solvency **returns** will only affect total shareholder funds to the **extent** that **the** discount rate in the embedded value calculation differs from the assumed net rate of return in the long term fund. Thus, if the valuation basis for solvency returns is weakened, the balance in the profit and loss account will increase by an amount equal to the reduction in reserves (assuming that the difference is transferred to the profit and **loss account**) but the value of future transfers to the profit and **loss** account, as measured by the value of future margins, will reduce as a consequence of the weakening of the basis for the solvency valuation. **If** the assumed net rate of investment return in the long term fund is equal to the shareholders discount rate then **these two** amounts will balance each other exactly - but subject to the overall caveat on taxation at the end of this section.

### Valuing future margins - the discount rate.

3 - 6 The value of future margins is determined by the directors acting on actuarial advice. They **will** rely more heavily on actuarial advice for some elements of the basis than for others ; one area where the directors will have substantial input is the choice of interest rate for discounting future shareholder cash flows (relative to solvency valuation reserves). Where the life assurance company is a wholly owned subsidiary of a public company, the shareholders **will** have set objectives for a return on equity (ROE) for every business in the group. This target ROE **will** have a significant **bearing** on the **discount** rate used in the valuation.

3 - 3 The question often arises as to whether or not to apply a discount factor to such reserves before adding them to shareholder funds. The justification for applying a discount factor is ~~that~~ the reserves cannot be released to shareholders immediately **and**, as the rate of **return** within the funds will be less than the **shareholders'** required rate of **return**, it is appropriate to discount such reserves, thus giving them a lower value for shareholder purposes. While one cannot argue against the theoretical correctness of this approach, it is much easier to tell the shareholders that such a reserve will eventually be released to them, but **until** then it will be tied up earning a lower rate of return than they would like. Having explained the approach taken, the reserve can then be added back at face value.

3 - 4 A similar approach can be taken to reserves for maturity guarantees, the **amount** of which will be based on ruin probabilities in solvency returns. In Companies Act **accounts**, it will be appropriate to add the excess of the reserve over expected costs to shareholder **funds**. **Similar** principles apply to reserves for a options, **AIDS**, etc.

Reporting **Actuary** v Appointed Actuary.

3 - 5 Similar questions as to whether **a** not to discount arise where the reporting actuary (the actuary employed by the directors to advise them on the calculation of the embedded value) considers that a weaker basis could be used for the purposes of the solvency valuation than has actually been used by the Appointed Actuary. The **correct** procedure in those circumstances is to project, using **embedded** value assumptions, the **future** margins which will emerge relative to the solvency valuation basis as chosen by the Appointed Actuary.

This approach eliminates the undesirable possibility of the reporting actuary being expected to comment on the appropriateness or otherwise of the chosen solvency valuation basis. **A** change in the valuation basis for solvency returns will only affect total shareholder funds to the **extent** that the discount rate in the embedded value calculation **differs** from the assumed net rate of return in the long term fund. Thus, if the valuation basis for solvency returns is weakened, the balance in the profit and loss account will increase by an amount equal to the reduction in reserves (assuming that the difference is transferred to the profit and **loss** account) but the value of **future** transfers to the profit and loss account, as measured by the value of **future** margins, will reduce as a consequence of the weakening of the basis for ~~the~~ solvency valuation. If the assumed net rate of investment return in ~~the~~ long term fund is equal to the shareholders discount rate then ~~these~~ two amounts **will** balance each other exactly - but subject to the overall caveat on taxation at the end of this section.

Valuing future margins - the discount rate.

3 - 6 The value of future margins is determined by the directors acting on actuarial advice. They will rely more heavily on actuarial advice for some elements of the basis than for others ; **one area** where the directors will have substantial input is the choice of interest rate for discounting **future** shareholder cash flows (relative to solvency valuation reserves). Where the life assurance company is a wholly owned subsidiary of a public company, the **shareholders will** have set objectives for a return on equity (ROE) for every business in the group. This target **ROE** will have a **significant** bearing on the **discount** rate used in the valuation.

However, the considerations governing choice of discount rate for **the** embedded value calculation are different to those relevant to the **setting** of ROE objectives for **the** entire company. For example, the fact that the business has already been written when the embedded value is being calculated means that **the** risk element is **considerably** reduced and can be used to justify a lower discount rate than **the** ROE objective for **the** business.

3 - 7 **The** factors affecting **the** choice of discount rate are discussed in detail by **Burrows** and Whitehead (7) in **the** context of **appraisal** value calculations. They looked separately at the risk - free rate and at the premium to be added for the various risk factors. **Normally** **the** discount factor for embedded value **calculations** is in **the** region of 10% to 15% **per annum** net of **tax**.

Assumed policy termination rate.

3 - 8 A natural starting point for the policy termination rate assumption is **the** office's own lapse experience. **Different** lapse rates are normally assumed for policies in their **first** year, in their second year, and for **those** which are more than two years in force. For policies in their **first** year, the lapse rate assumption is sometimes considered separately for policies less than three months old, between three months and six months in force and from six months to twelve months in force. It is normally assumed that the probability of lapse reduces with duration in force but recent American experience suggests that this may not always be true in the case of Universal Life policies.

3 - 9 In the normal situation where positive shareholder cash flows will emerge in future on a contract, the lower the lapse rate assumed, the higher the embedded value. **Thus**, it is important **not** to underestimate the probable level of future policy terminations and thus overstate the value of future margins when completing the embedded value calculation. The question of whether or not deliberately to overestimate future policy **termination** rates when completing an embedded value calculation **will** be addressed when we return to the question of recognising sales and service aspects of the contractual relationship in reporting profit for a period.

Renewal expense levels.

3 - 10 Expenses must be **analysed** between initial, maintenance (or renewal) and **overrun** of actual **expenses** in a period over standard loadings / allowances for a business sold or renewed in **the** period

**The** *importance* of various aspects of this analysis to the overall financial **direction** and valuation of a life assurance company will be discussed in later sections but for the **purposes** of the embedded value calculation only unit renewal expense levels are relevant. The units for renewal expenses analysis purposes are premiums (for renewal **commission**), policies being **terminated** or claimed (termination costs), funds under management (for investment expenses) and policy numbers (**most** other expenses).

3 - 11 Assumptions regarding renewal expense levels must be considered in conjunction with **corresponding** assumptions about charges against policyholders for maintenance **expenses** in respect of **contracts** of **the** flexible whole of life variety. **This** leads us back to the question raised in the **introduction** of how the conflicting interests of **the** policyholder and **the** company are balanced when such charges are being set from time to **time**.

Investment return I inflation.

**3 - 12** Ideally, **the** assumed rate of investment **return should** be considered separately **for** the taxable **portion** (mainly investment **income**) and the untaxed portion (**unrealised** gains and indexed **realised** gains in the main). This breakdown of the investment return assumption is particularly important for valuing the tax asset and for projecting requirements for extra capital from the shareholders in **the** context of a model **office** open to new business.

**3 - 13** The assumed rate of inflation of renewal expenses should be consistent **with** the investment **return assumed and** with the assumption **on** indexation of gains for CGT purposes. The assumed future rate of increase in the expense charge against policies (where increases in such charges are allowed) also falls to be considered under this heading. This **will** normally be assumed to increase at **the** same rate as unit maintenance **costs**. However, if the current unit renewal **cost** per policy (net of **tax**) is less than the regular policy **administration** charge, then the higher **the** rate of inflation assumed **for** both **costs** and charges in future, the higher the value of future margins (this may not be true for high life cover **contracts**).

If this is the case then the prudent (and probably more realistic) assumption is to allow for maintenance charges to increase in future at a lower rate than unit costs since a margin increase is unlikely to be sustainable in competitive **conditions**.

Projection period.

**3 - 14** On purely pragmatic grounds, to reduce the amount of computer processing time, it is advisable to specify a maximum projection period for embedded value purposes. **Ten** years from policy issue is not too short, particularly bearing in mind the effect of discounting and of policy termination assumptions. Such **an** approach is made more **justifiable** by virtue of the fact that the usual contract design allows for most margins to be realised during the first ten years of a contract's existence. **A** quasi - theoretical justification, particularly in relation to more modern forms of unit linked policies, is that a policy which is more **than** ten years in force is more like a unit linked "deposit" account and can be treated like a bank deposit, where profit is **only recognised** for accounting purposes on the realisation of margins. This justification is associated closely with the "income" as opposed to "asset" approach to embedded values, the philosophy of which will be outlined in more **detail** in later **sections**.

To measure **the** projection **period** from the valuation date rather than from the policy commencement **date** introduces another element of profit into the analysis of income viz profit from extension of projection period. This causes no particular theoretical problems.

The suggestion of ten years as a suitable projection period is not unrelated to the problems encountered in **trying** to project cash flows after **ten** years on flexible whole of life policies where cover cannot be maintained after that period without premium adjustments.

### **Mortality assumptions.**

**3 - 15** The **reasonableness** of the margin between the rate **of** mortality assumed in the embedded value calculation and the assumed future mortality charges against policyholders' **unit accounts** must be **tested** by reference to current practice, **illustrations** at time of sale, practice in the market, general considerations of equity, **etc.** The **onset** of AIDS has not made resolution of **such** issues any easier.

When looking at mortality assumptions, consideration must also be given to **contractual** guarantees on **sustainability** of cover.

### **Taxation** I value of unrelieved management expenses.

**3 - 16** All embedded value calculations of future policy margins are carried out net of **tax**. For business in the Life Fund, the emerging cash flows after allowing for tax on investment **income** and for relief on expenses are discounted at the chosen risk discount rate. For pension fund business, the cash flows after allowing for gross interest and gross expenses are netted at the corporation **tax** rate and discounted. This approach assumes that investment income in future will exceed policy maintenance **expenses**. This is very likely to be the case for the business in its entirety when future new business and associated expenses are excluded **from** the **calculations**.

**3 - 17** The cumulative excess of relievable expenses over total investment income at the valuation **date** is **an** asset, **the** value of which depends on how long it will take before cumulative taxable income exceeds cumulative relievable expenses ignoring future new business.

In calculating excess E, it is important to include only that portion of capital allowances that has **been** "earned" to date in accordance with the company's depreciation policy for its Companies' Act accounts. Also, in projecting future investment income and expenses in order to assess the discount factor to **be** applied to the tax rate for valuing excess E, appropriate allowance should be made for expenses that are unrelievable for tax **purposes**.

Another question worth debating is the extent to which **cognizance** should **be** taken of **unrealised** taxable **gains** on investments when trying to estimate the length of time it will take to generate enough taxable income to cover unrelieved expenses at the valuation date. **AU** other things being equal, a company with a high level of **unrealised** gains at the valuation date is likely to realise its excess E tax asset sooner than a company without such unrealised gains and will thus assign a higher value to it.

**3 - 18** - In any discussion about **tax**, it is very **difficult** to talk about broad principles without considering the detail of the tax computations. Among the **items** of detail that **need** to be **considered** are :

- The possibility that a Notional Case 1 restriction may impact **adversely** on the value of the excess E tax asset.
- The fact that excess E carried forward cannot be relieved against franked investment income.
- The possibility that a portion of shareholder profits in future may be deemed to be paid out of franked **investment** income.

3 - 19 An alternative approach to the question of **tax** to that **outlined** above is to project gross investment income for a **period** in **the valuation of future** margins, **the period** for which **the** projection is completed on a **gross** basis being **determined** by the time it will take to use up the excess E existing at the valuation date when future new business is ignored.

#### 4 - MEASURING PROFIT

4 - 1 The embedded value calculation as described in section 3 is a static representation of shareholders' interest in the long term fund at a particular point in time **and** has no real meaning unless considered in conjunction with the assumptions underlying its calculation

The use of embedded value techniques to help in **analysing** the dynamics of profit generation within a life **assurance** company will be discussed in this section as will the communication of those **dinamics** to the people charged with the responsibility for direction and management of the company. The emphasis is on variances rather **than on** absolutes. It is about giving messages that are clear and actionable in relation to improvement of the **profitability of the** company.

The constituents of profit

4 - 2 The net income or profit in a period on embedded value principles can be expressed as :

**Premium income**

plus Investment income and gains

less **Claims**

less Expenses, Commission and Taxation

less Gross **Increase** in solvency reserves

plus **Increase** in Non - Distributable reserves

where changes in **solvency** reserves and in non - distributable reserves exclude changes of a capital nature not attributable to that accounting period.

4 - 3 However, this analysis does not provide much actionable information for management nor **does** it tell directors / shareholders what **aspects** of the business are going well and what aspects are going badly. An alternative analysis of the **net** income figure which does address these questions in a meaningful way is the following :

i) Value of future margins at point of sale.

ii) Persistency profits

iii) Mortality **and** other experience **profits** / losses.

iv) Investment performance effects.

v) Shareholders' investment return :

- on invested assets

- on value of future margins.

- vi) **Expense** underrun (**profit**) or **overrun** (loss).
- vii) **Tax** profit or loss.
- viii) Change in assumptions.

4 - 4 Each of these elements will be addressed in turn in the following paragraphs but it is worth noting in advance **that**, like all analyses of surplus (which is **what this** analysis is using conventional actuarial terminology) it is essentially an arithmetical exercise and a number of **different** routes can be taken in exploring each element of the analysis. What follows is an example of one **person's** approach taken in **one** particular office with a particular blend of business and at a particular **stage** in its development. Other, equally valid, approaches would be **appropriate** in other circumstances.

### **Value of future margins at point of sale.**

4 - 5 The value of future margins at point of sale for **new** business in the **accounting** period will be shown separately for major categories of business.

Obvious divisions are between regular premium and single premium business. It is also likely that profits at point of sale will be shown separately for different sales channels.

4 - 6 The basis used to compute the value of future margins (relative to solvency reserves) at point of sale will be the same as that underlying the embedded value calculation.

An additional assumption must be made about expenses at point of sale (which do not enter into the embedded value calculation). For the purposes of later analysis it is assumed that immediate full tax relief can be claimed on expenses. **The consequences** of this assumption will be explored in more detail when the "tax profit or loss" element of the analysis is being discussed. **A** particular effect of this assumption of immediate **tax** relief on expenses is that regular premium business appears to be more profitable relative to single premium business than would otherwise be the case for an office with an expense carry - forward.

4 - 7 This is not the only area where care must be taken in interpreting the statement of profits at point of sale. The discounted value of future margins, while taking full cognizance of required mathematical reserves in projecting future cash flows, makes no allowance for the different solvency margin requirements of different contract types. In fact, the need to hold a solvency margin is **ignored** completely in the analysis of income.

If solvency margins were excluded completely from shareholder funds and if they required the setting up of explicit **extra mathematical** reserves in the long term fund, then the interest cost of having to maintain solvency margins could be **recognised** in the embedded value calculation in the same way as the cost of normal solvency reserves is **recognised**. But the required solvency **margins** can be covered in a variety of ways and their effects can also be mitigated in a number of ways. Therefore, life is made a lot easier by ignoring them in the embedded value calculation and in the analysis of profit.

This has the effect of making contracts with high solvency margin requirements appear more profitable than is the case when solvency margins are taken into account.



In reality, premiums will be set and profit criteria determined after allowing appropriately for solvency margins. Therefore the dangers of wrong decisions being taken **on** this account are minimal. **Furthermore, the** question of capital usage, including solvency **margin** coverage, **will** be addressed in longer term planning exercises. These **will** be discussed in section 5.

4 - 8 While the statement of **profits** at point of sale must be handled with care, it can provide very **important information to management** and to **directors** on the progress of the business, particularly when it is supplemented by analyses of new business profitability which allow for other approaches to **tax** and which allow for the need to set up solvency margins. This item in the analysis of net **income** will be one of the largest **contributors** to profit in a company selling good volumes of business **on** reasonable margins.

The interpretation of the result can **be** helped by expressing the total margin on new business as a percentage of total new business **written** in the period (the measure of volume probably being commission value to eliminate the "apples and oranges" effect of combining single and regular premium business, **etc.**).

Thus, it is easy to follow the trend from one accounting period to the next in both volume and margins, a significant change in either being a possible cause for management action.

### **Persistency / Service profits.**

4 - 9 The easiest way of measuring persistency profits is to calculate the value of future margins at the end of the accounting period **for** policies still in force but which were assumed to have lapsed during the accounting period in accordance with **the** lapse assumptions underlying the embedded value calculation. There will also be a minor revenue effect for margins on premiums actually received during the period on such policies which can be ignored in a practical analysis (particularly if the analysis period is short - say a month or a quarter).

4 - 10 **A** strong argument can be advanced for assuming a higher lapse rate in the analysis than is expected to be experienced in practice. The deliberate retention of a margin in the lapse rate would satisfy the accounting requirement to **recognise** the service aspect of the contract as well as the sale aspect. To illustrate this argument, suppose a company works very hard at ensuring superior service quality to existing customers. **As** a result it experiences lower lapse rates than are **normal** in the industry. Is it right to **recognise** profit now **on the** assumption that **the** level of service quality will be maintained in future? Would it be better to **recognise** only the profits arising from the better **retention** of customers **this** year **and**, if superior **service** is maintained in future years, then profits will also emerge from this source in **future** years?

**Acceptance** of this argument - which is really saying that revenues and costs should be matched - has fundamental importance for the meaning which should be attached to the embedded value calculation in the balance sheet. That calculation changes **from being** an **approximation** to the "**market**" value of **the** shareholders' interest in the long term fund to being more of a reference point for the calculation of earnings. The consequences of this approach for the valuation of a company will be pursued in sections 5 and 6.

Mortality and other experience profits / losses.

4 - 11 The **mortality profit** is the actual mortality strain in the period compared with the expected strain **on** the mortality table underlying the embedded value. It would, of course, be wrong to equate the mortality profit for flexible whole of **life policies** to the excess of total mortality charges over the **non** unit (in Ireland we **cannot** say sterling 1) element of death claims. The charging system, whether it be for mortality or for **administration** expenses, is purely a matter of product design and has no bearing on true **profitability**.

4 - 12 Other profits / losses is a bit of a catch - all and might include, for example, profits / losses due to timing differences between creation and allocation of units, margins on sales charge, **rounding** charge **a** bid offer spread more or less than had been anticipated in the embedded value basis. Some of these elements may merit more detailed investigation from time to time, **mainly** with a view to **improving aspects** of the company's administration systems or to revise the assumptions for pricing and embedded value purposes.

Investment performance effects.

4 - 13 Assuming unit liabilities are matched exactly, profit arises under this heading when units grow in value at a faster rate than had been anticipated in the **embedded** value calculations. **If** one assumes a random **walk** pattern for unit price movements there is no presumption that unit prices, having increased by more than **expected**, are more likely to revert to some trend line in **future**.

The value of **future** income **from fund** management charges for units **purchased** prior to the valuation date is thus greater than expected by a percentage equal to the excess of the actual growth in unit price in the accounting period over the expected growth in price in the same period.

Future expected expenditure is increased only to **the** extent that a portion of expenses may be assumed to vary in proportion to fund values.

Shareholders' investment income.

4 - 14 The **first** part of this element of profit will **include** not only investment income and gains (net of **tax**) on explicit shareholder investments but will also include **the** net investment **return** on actuarial reserves set up in **an** ad hoc manner without any explicit allowance for future investment return e. g. closed fund **run** off reserve. Policy - specific non - linked reserves have been ignored. It will also include net interest on the excess of current assets over current liabilities to the extent that such interest has not been anticipated otherwise in the analysis.

4 - 15 The second part of the profit under this heading is interest at the rate assumed in the embedded value calculation on the "value of future margins" shareholder asset. The effect of adding interest to the excess E portion of this asset will be to increase the effective **tax** rate at which excess E is **being** valued Regular premium new business will act in the opposite **direction** to reduce the effective tax rate because it extends the period to realisation of the asset. **The** overall effect will be "mopped up" under the **tax** loss heading as discussed below.

Expense **underrun** or overrun.

4 - 16 The value of new business **at** point of sale as analysed above will have allowed for initial expenses at standard rates based on product allowances for new business **written** in the period. Also, the embedded value calculation at the end of the **previous period** will have anticipated standard renewal expenses in **the** accounting period. To standard expense **allowances** should be added charges against policyholders for partial **encashments**, switches etc. which have not been allowed for in **profit tests**. **The** total of these standard expense allowances (netted as appropriate for tax relief) should be compared with actual expenses incurred in the period, also netted **appropriately** for **tax**. **The** result is the expense **underrun** or overrun to be included in the analysis.

4 - 17 The analysis of the expense **underrun** or overrun can get very complicated, particularly when a company is growing fast. In such circumstances it is quite possible that **total expenses** incurred will exceed product **allowances** and it is very easy to justify the **overrun** on the basis of "development". While there may be a lot of merit in **arguments** for **deferring** expense recognition of development expenditure, the fact is that all expenditure must ultimately be recovered from product allowances or as a charge against shareholder profits. If we **capitalise** a portion of our expenditure we must charge more than the amount capitalised to future revenue periods in **order** to justify the expenditure as an investment. Too often, people have been quite prepared to capitalise expenditure but have forgotten that **the other side** of the same coin is to charge it against revenue in future periods.

Tax profit or loss.

4 - 18 The inclusion of this item in the analysis results from the fact that, up to now, we have assumed that all expenses are immediately relievable for **tax** purposes (the same approach can be taken for commercial pension fund **losses**) **The** loss can be **analysed** in **two parts** :

a) Expenses which are **unrelievable** for **tax** purposes (**e.g.** entertainment expenses, a proportion of motor expenses etc.) : the loss is the full tax rate (35% in Ireland) applied to such expenses

b) Relievable expenses in excess of taxable investment return should only be included at the tax rate used in calculating the excess E tax **asset**. **The** loss under this heading is calculated by **comparing** the actual excess E **tax** asset at the end of the period with its amount at the start of the period after crediting interest at the shareholders' required rate of return **and** after subtracting notional **tax** at the full rate on the excess of taxable investment return over relievable expenses in the period (adding where expenses exceed income). This loss will almost invariably be attributable to new business and can be associated with it in the overall analysis. Even then, **the** analysed **tax** loss will understate the **effect** of delayed relief **on** new business expenses on a stand **alone** basis. It is a moot point whether the beneficial **tax effects** of the capacity of existing business to generate future excess investment income should be awarded to new business in this manner.

### Change in basis.

4 - 19 If the embedded value calculation is looked at **as** a reference point for the calculation of profit in a period, as has **been** the view taken in this section, then a passive approach to the calculation of embedded values is indicated.

This is because changes in values resulting from changes in assumptions under an active basis are difficult to assign as profit / loss to the correct accounting period. **A** consequence of adopting the passive approach is that, **as far as** is reasonable, the valuation basis remains unchanged from when business is transacted. However, each year's tranche of new business will have its own valuation basis.

The attraction of this approach is that it is a type of book value / premium basis approach to embedded values and the progression of earnings (**i.e.** net **income**) from year to year, **as well as** the constituent elements of each year's earnings, **can** be assessed in investment terms like any other stream of earnings, with a minimum of actuarial interpretation. (Some may see this as a disadvantage! ).

Against this **can** be put the fact that the balance sheet embedded value ceases to have much meaning in its own right **as** it is now an amalgam of values calculated on different bases. **A** suitable analogy is a statement of assets at book costs rather than at market value.

### Gross and Net Profits.

4 - 20 Income / **earnings as** defined in this section are net of **tax**. The quoted owner of a life company which calculates life business profits using **embedded** value principles will gross up the increase in the value of the long term business in force for tax at the Corporation Tax rate in arriving at a gross profit amount for comparison with **gross** profits from other areas of activity within the group.

## 5 - MODEL OFFICE, CAPITAL USAGE, APPRAISAL VALUES.

5 - 1 A model office is an essential tool for studying various aspects of the finances of a life assurance company. Some applications are **as follows** :

- i) Its most important function is to project future capital needs and emergence of distributable profits. Embedded value calculations and analyses of net income have no role to play in this regard. The model office has to be developed before a life assurance company is formed as detailed projections of capital needs are necessary accompaniments to an application for authorisation to transact life assurance business. Capital requirements also include minimum solvency requirements under the European Community Life Directive.
- ii) Assumptions made in the calculation of embedded values, net income analysis and in profit tests on the relievability of expenses for **tax purposes** must be verified in the context of a company's overall operations. The model office has to project not only a company's "I minus E" and case IV (case VI in UK) **tax charges** but **it** also must allow for any Notional Case 1 restriction on relievable expenses in future.

The **projections** for these purposes must be **completed both** on an open fund basis and ignoring future new business, the latter being required to **ascertain** a discount factor for the excess E tax asset.

iii) Ideally, the model should include its **own** embedded value **routine**. This allows the model to be used to project future profits and to verify (in general **terms**) the net income results for past **accounting** periods. In particular, this facility in the model can be of great assistance in **analysing** net **income** into its various **elements**. For example, the model will assume policy terminations and mortality in accordance with a defined basis (which does not have to be the embedded value basis) and **actual** experience can be compared with this test tube result.

iv) The model office can be used - ideally in an interactive fashion - as a powerful tool for **long term** planning purposes. The appropriateness of various strategies can be tested by projecting for each strategy total earnings over (say) the next five years together with the associated capital inputs / emergence to enable the ROEs implied by the projected earnings to be calculated. **The** factors driving earnings growth under each strategy can be indicated, at least in broad terms, by analysis of various figures in the model office projection.

5 - 2 The starting point for the model office will be **profit** tests for various product **types** (monthly cash flows) which are used to generate files of "value of future margins" on the embedded value basis at all durations in force. The model office revenue stream is generated by applying experience factors - most likely different to embedded value experience assumptions - to projected sales of policies each month (both past to reproduce the current in **force** and future sales). The revenue items thus **generated** for **premiums**, claims and policy related liabilities can be taken without adjustment into the final model.

Standard expense allowances will also be generated by the product driven module of **the** system and, depending on the sophistication of the model, these can either be taken without **adjustment** into the final model **office** or adjusted to take account of expense **overrun / underrun**. Investment income and gains - which must be consistent with rates assumed by the model in deriving policy liabilities - are then calculated as is **the** total tax liability and transfer to or from the profit and loss account.

5 - 3 Much time could be spent discussing model **offices**. From a distance they seem far more **intimidating** and difficult to **construct** than is the reality. The model can start very modestly - an expanded profit test - and the process of "**complexification**" follows a classic **evolutionary** pattern.

Surprisingly good **results** can be got from even a simple **model**. At the same time, it has to be admitted that the author's current perspective is **from** an office less than two years old which transacts only unit linked business : other people may have completely different views on this question.

Value equals multiple of earning.

5 - 4 Analysis of **earnings** an **embedded** value principles as outlined in **section 4** can be **used** in conjunction with projections of capital needs and profit **projections** prepared with the help of **model** office techniques to get a fairly rounded picture of **the** **profit** dynamics of a **company** and to value it on a range of different **assumptions** as to future experience.

The basis underlying the embedded value **calculation** is not of critical **importance** to the process of placing a value on the company provided that the analysis by **source** of resulting **earnings** is readily available. For example, if the embedded value calculation incorporates more **conservative** lapse assumptions **than** are likely to be experienced in future, the embedded value will be lower than that calculated on realistic lapse **assumptions**. However, the lapse / service profits in the former instance **will** be higher than **those** shown in the profit analysis completed using realistic lapse assumptions. On the other hand, the new business element of the profit will be lower when more **conservative** lapse assumptions are adopted. In normal operating circumstances the **total** profit using realistic embedded values will be higher than the total profit shown using more **conservative** assumptions for associated embedded value calculations. However, the **higher** quality of earnings and lower **dependence** on **new business when** profits are based on conservatively estimated embedded values **will** compensate for their lower quantity. This higher quality could be reflected in valuation **terms** by **assigning** a higher multiple to lapse / service earnings in **the** analysis **than** that awarded to new **business**. Thus the final valuations of the company on both bases will be much closer than would be indicated by a straight **comparison** of profits. Ideally, the values arrived at under **both** bases for the same company writing the same **business** should be identical.

While it may be ambitious to expect companies to publish a full analysis of earnings on the lines of section 4, some analysis of the more important sources of earnings should be **required** to be disclosed in view of the importance of earnings from different sources as indicated by the above example.

Even a simple sub division of last year's earnings into new **business** and **other** and a similar sub division for current year's projected earnings would go a long way towards satisfying the disclosure requirement.

Appraisal values.

5 - 5 This approach to valuation of a life company differs significantly from the appraisal value approach which seems to be the most commonly used method of valuing life assurance companies. The appraisal value method is described fully by Burrows and Whitehead (7). Some of the more important features of this method of valuation are :

- i) The appraisal value approach is essentially balance sheet based. The value of the shareholders' **interest** in the long term fund is calculated on assumptions that try to be as realistic as possible ; goodwill is estimated by calculating the profitability of one year's **new** business and finding an appropriate multiple to apply to that figure by projecting future new business and discounting the value of that new business back to the **present date** at an appropriate discounting rate (normally higher than the rate used in valuing new business after sale) ; expense overrun is also **capitalised** appropriately and deducted in **finding** the appraisal value.
- ii) The methodology finds it **difficult** to allow **appropriately** for the future capital **needs** implied by the appraisal values obtained. This problem was highlighted by J. H. Sutcliffe in opening the discussion of Burrows and Whitehead's paper.

iii) Results can be highly sensitive to the **assumptions** incorporated in the valuation, particularly the discount rate to be applied to **future new business** and the assumed rate of **growth** in future new business. Fine judgement is required when **choosing** the assumptions to be adopted. Unfortunately, the consultant rather than the purchaser **may** be the possessor of the **knowledge necessary to make** that judgement.

Comparison of appraisal value and earnings multiple methods of valuation.

5 - 6 The earnings multiple approach to valuation of life assurance companies places the purchaser more in **command** by approaching the problem using terms and expressions that he **will** be familiar with **from** his own business experience. Suitably advised, he will know whether earnings from **persistence** profits can be improved; he will be able to make a judgement on the future **wise** of the expense **overrun**, given past trends and future plans for expansion or rationalisation; **etc.**

5 - 7 While earnings from new business, **analysed** in **detail** by product and by sales channel, will be available to him if the disclosure requirements outlined above are implemented, it is quite likely that the purchaser will have his own plans for development of various sales channels in future. Therefore past analyses of new business earnings will not have much **significance**. Detailed plans **will** be prepared for volume and / or margin improvement **on** future sales, the consequences of which will be reflected in projected margins at point of sale and **capitalised** using **an** appropriate multiple. The consequences of these new business plans will also have capital implications which must be projected in parallel.

Of course, the purchaser will only be prepared to pay for the company's existing capacity to generate profitable new business. The vendor should not be paid for something that was not his to sell.

5 - 8 In practice, the appraisal value approach as outlined in section 5 - 5 and the earnings multiple approach recommended in this paper may **not be that** far apart. While Burrows and Whitehead produced in their paper a table of goodwill multipliers based on various **risk discount** rates and new business growth **assumptions** they went on to say that it would be **wrong** to choose a multiplier by mechanical application of a formula of this type.

5 - 9 Change in appraisal value has sometimes been **suggested** as a basis for measuring the success of a company in a particular **accounting** period. The problem with this measure is that it awards too much importance to the goodwill element of a company's **total** value. Thus, a relatively small change in the projected future earnings from new business or in the multiple to be applied to those projected earnings could have a **significant** effect on the **total** appraisal value. Value would then be given for earnings before they had actually been realised. Critics of all approaches of **this** nature, whether the approach is of the embedded value or of the appraisal value variety, will say that this is always the case in a system which makes allowance **now** for future cash flows. A critical difference between the **two** is that a change in embedded value in an accounting period only **recognises** future cash flows from policies sold already while a change in appraisal value **could** incorporate **some** recognition of future cash flows from future sales. It's a bit like the difference between giving credit for discovering oil **deposits** and giving credit for an ability to discover oil deposits in future.

5 - 10 A better measure of success is the profit in a period on embedded value principles expressed as a return on equity. **This** method of measuring the success of the business gives due recognition to the **ability** of management to **minimise** the amount of capital tied up in the company. **In** this regard, it is surprising **that** Sir Edward **Johnston**, in his recent Institute paper on "The Appointed Actuary" (8), made no mention of this potential conflict of responsibility for the Actuary who was **also** Director of Finance.

## 6 - CONCLUSION.

6 - 1 **This** paper started off by *noting* the deficiencies in traditional methods of reporting life company results where **normal** logic is stood on its head in that losses can be good and profits bad. An extreme example of the dangers of placing too much credence on the **virtues** of statutory sales as a measure of sales success is quoted by **Posnak** (9):

**"Take, for example, the new company phenomenon and the old adage "the more you lose, the more you make". Most people no doubt recall the explosive growth of new companies in the high flying 1950's and 1960's. Fortunes in the stock market were made on companies that reported enormous statutory losses on the basis that (1) profits were guaranteed in the life assurance business and (2) statutory losses do not mean anything.**

**Sad to say, in some cases the statutory losses masked real losses, and many of the companies have long since disappeared".**

6 - 2 The paper then discusses the US GAAP solution to the problem. The decision to give at best neutral recognition to the sale in GAAP accounts is completely at variance with the importance accorded otherwise to sales, not **only** in terms of the emphasis on new business figures in annual reports but also in terms of the money spent by life assurance companies in trying to get more new contracts of insurance.

6 - 3 By **contrast**, **embedded** value accounting, under which the present value of **margins** in the long term fund is added to shareholder funds, runs the risk of giving too much recognition to the sale and not enough recognition in profit terms to service aspects of the contractual relationship with a customer. However, it provides a valuable framework which can be used to award virtually any **desired** weightings to the sales and service aspects of the relationship.

This versatility makes the embedded value technique a very valuable tool for **use** in life assurance accounting but its inherent power **needs** to be controlled: - otherwise the messages conveyed can be **difficult** to comprehend and can be misunderstood.

6 - 4 The paper looks at various technical aspects of embedded values from both balance sheet and revenue view points and the conclusion is reached that embedded values are more useful for measuring profit than for estimating **shareholders'** funds. It is **too difficult** to have a single framework for shareholder funds and for period profit. This decision leads to the concept of an embedded value "signature" for each **policy** which is assigned to it at point of sale and which, as far as possible, remains unchanged throughout its life. Thus, the embedded value shown in shareholder accounts may be calculated on a multiplicity of bases related, for example, to year of entry. It will



therefore be of little value in assessing the "market" value of the shareholders' interest in the long term fund at a balance sheet date.

6 - 5 The strength of the embedded value approach should be **harnessed and controlled**, **not** only by limiting **the score** for changing bases with the **consequent risk** of confusion of capital and revenue items of **income** / expenditure, but also by requiring a disclosure in accounts of an analysis of profit into its major components **e.g.** new business, persistency / service, income on existing embedded value.

Historic **information on total** earnings and on **the** progress of earnings by **source** should enable life assurance companies to be valued using standard techniques of investment analysis. This **de-mystification** of life assurance accounting should benefit not only analysts but also directors, shareholders and management.

Also, while **the** separation of solvency returns and Companies Act **accounts** is a central theme **of** this paper, the author believes that accounts in the suggested format will help the supervisory authorities by providing early warning signals on companies that are **being** managed less **efficiently** than others in the industry.

6 - 6 The paper does not reach a definite conclusion on what weightings should be given to sale and to service / renewal in profit recognition. Different accounting systems can be viewed as different points along the continuum of weightings to be awarded to these two aspects of the contractual relationship in life assurance. Accounting on the basis of solvency returns gives a negative weighting in profit terms (**i.e.** a loss) to the sale and thus a higher weighting than any other system to **the** service aspect. GAAP reporting on American lines reduces the negative weighting at **time** of sale but does not eliminate it completely because of the non deferral of some acquisition costs. Embedded value accounting can be moulded to suit any **of** these approaches to profit recognition and can also be extended much further - to the extreme, if embedded values are calculated on best estimates of future experience, that the only profit **recognised** (on average) after the policy has been sold will be interest at the shareholders risk discount rate on the embedded value which, for an individual policy, reduces as the **margins** relative to the solvency valuation basis are **realised**.

To some extent, it does not matter too much where along the continuum the basis for the embedded value is pitched (subject to normal requirements of **prudence**) so long as the sales service weightings are reasonably clear in general terms to users of **the accounts**. That clarity is achieved through the analysis of profit. Differences in weightings awarded to different aspects of the contractual relationship will be reflected in the quality of **the** resulting **earnings**.

6 - 7 While saying that there should be relative freedom on the choice of basis for embedded value calculation - with the associated publicity of the various financial effects of that basis on reported earnings - the author favours an approach to profit recognition which tried to allocate profit to **different** activities in proportion to the cost of those activities. This would be achieved by solving for **the** assumed **termination** rate in the embedded value calculation which provided the desired sales / service weightings, other elements of **the** basis being chosen by normal methods.

However, this debate is quite a long way down the road from where we are as an industry today in **terms** of how we account for our stewardship. It is hoped that this paper and the debate will help us on that journey.

## REFERENCES

- (1) Working Party of Institute of Actuaries • Chairman J.A. Geddes (1988) "**Recognition** of Life Assurance Profits - The Embedded Value Approach". Draft report discussed on 7th November, 1988.
- (2) Fisher, H. F. and **Young, J.** (1965) "Actuarial Practice of Life **Assurance**" - Cambridge University Press.
- (3) Creedon, S. (1979) "US **GAAP** - A UK Actuary's Perspective" - JSS, 23,125.
- (4) Underdown, B. and Taylor, P.J. (1985) "**Accounting Theory & Policy Making**" - He ———
- (5) Myers, J. H. (1959) "The Critical Event and the Recognition of Net Profit" - The **Accounting** Review, October 1959.
- (6) Benjamin, S. (1976) "**Profit and Other Financial Concepts** in Insurance" - JIA 103,233.
- (7) Burrows, R. P. and Whitehead, G. H. (1987) "**The** Determination of Life Office Appraisal Values" - **JIA** 114 , 411.
- (8) Johnston, E. A. (1988) "The Appointed Actuary" Presented to the Institute of Actuaries - 28th November, 1988.
- (9) **Posnak, R. L.** (1973) "**What's Good - and Bad - About GAAP**" - **Best's Review** - July, 1973.
- (10) Smart, I. C. (1977) "Pricing and Profitability in a Life **Office**" - JIA 104,125.
- (11) Squires, R. J. (1987) "Unit Linked Business" - Life Assurance Monograph prepared f a **Education** Service of Institute **of** Actuaries .
- (12) **Goford, J.** (1985) "The Control Cycle : Financial Control in a Life Assurance Company" - **JSS** 28, 99.
- (13) Lee, R. E. (1984) "A Prophet of Profits. An Introduction to the theory and applications of profit tests" - **JSS** 28.1.