

GUEST EDITORIAL

BY G. C. TAYLOR

It is a privilege to contribute an editorial following those of Professors Wilkie and Norberg.

Those first two guest editorials focused largely on the relation between actuaries and scientific development. Both made references to advances in the statistical or financial literature perceived as relevant to actuarial endeavour, but pointed to actuaries' reluctance to embrace them.

For continuity with those contributions, I shall develop this theme a little further, but examine the *process* by which the actuarial knowledge base advances rather than specific successes and failures of that process. I shall then attempt the beginning of a new theme by shifting my focus to matters that have a practical bearing on the everyday professional lives of some actuaries. The practical matters relate to general insurance, the field with which I am most familiar.

ACTUARIES AND KNOWLEDGE DEVELOPMENT

Let us consider financial economics, a subject discussed in the prior guest editorials. Outside the actuarial profession, the validity of this body of knowledge is not seriously in question. In any subject there will always be debate about this or that aspect, but, in Kuhnian terminology, the paradigm is not in question in this case.

Despite this, a part of the profession has displayed great resistance to the concepts involved. I do not wish to discuss the rights and wrongs of this in itself, but to use this example as indicative of the way in which the profession advances (or fails to advance) its scientific underpinnings.

I think it fair to say that the profession, as a whole (perhaps no differently from other professions), from time to time responds with animosity to 'outsiders', often academics, who presume to comment critically on its methods. The reasons for this range from trivially emotional ("I've worked in this area, man and boy, for thirty years ..., etc., etc.") to others that lie deeper in the collective professional psyche.

I shall attempt to elicit these by comparison with other areas of scientific endeavour. My own experience has been a mixture of academic and commercial, of pure scientific and business. It is interesting to observe the process of advancing knowledge in the pure sciences.

What I find most noticeable is the radical nature of the process. In the field with which I am most familiar, theoretical physics with a cosmological

slant, it seems that no idea is too far fetched to be proposed seriously. And what is far fetched to one generation may be mainstream to the next.

Thus, knowledge evolves by a process of natural selection. The whole collection of proposed ideas, both the sensible and the seemingly silly, provides the pool of mutations, from which only those that turn out to have a high fitness score survive.

It is not surprising that the development of knowledge within a profession takes a different course. By definition, a profession is not just an amorphous collection of individuals, but a coalition that has formed to co-operate in some common interest. This would normally include the cultivation of a public face, the public demonstration of competence and reliability of the members.

For example, managing other people's money is a serious business, and it would not be seemly for those associated with it to be perceived as flighty or engaged in intellectual ratbagery. The by-word in knowledge development becomes conservatism. If only the profession can satisfy itself and others that its expertise has been developed to a state of completeness, everyone can relax, secure in the perception of solidity and reliability.

But the effect of the conservatism is to filter out many of the 'knowledge mutations', and so to retard evolution. Stability is achieved at the expense of slower development.

This creates a tension between the profession's interests and the quest for understanding in its own right. With reference again to the Kuhnian framework, marginal movement of the frontiers of knowledge is seen as productive, but any attempt to shift the paradigm is liable to be viewed with suspicion or hostility. This is not altogether surprising, as any suggestion of fundamental change to the knowledge base carries a tacit implication of existing deficiency.

The tension may fulfil a useful role in balancing competing societal needs, but I think that we should recognise it for what it is. And we should accept the 'professional drag' on knowledge development. I do not see what can or should be done to change this. Perhaps here, as in most other aspects of life, a little self-awareness and tolerance of others can be useful in relating to the world around us.

RELEVANCE AND PRACTICALITY

I should like to comment on one other aspect of the incorporation of new ideas into a body of knowledge. In more philosophical spheres, new ideas may be welcomed simply because they provide interest or diversion. For a profession, however, they would usually have to meet the test of relevance and/or practicality. Do they inform the profession's views? Are they capable of incorporation in the conduct of its affairs? These are decisions that do not always command universal agreement.

In facing specific instances of these questions, I have found exposure to academia and the pure sciences beneficial. The benefit lies in the fact that one inevitably, and regularly, encounters intellects much greater than one's own in this arena. One is often, therefore, in the position of struggling for understanding of the material imparted.

Without a doubt, this is sometimes because ideas are poorly presented. However, to shrug off all difficult concepts in this way would be lazy and self-indulgent.

This encourages a discipline of self-evaluation. Each time I encounter ideas whose relevance is unclear, I must enquire as to whether fault lies with the ideas themselves, or the frailty of my own understanding.

Indeed, I would suggest that relevance and practicality are very much in the eye of the beholder. The failure to perceive either may reveal as much about one's own limitations of comprehension or vision as anything else.

The conclusion to be drawn from this is neither new nor remarkable, with a pedigree dating back to the Renaissance. It is simply that the healthiest default position toward novel ideas is one of tolerance rather than animosity.

SUPERIMPOSED INFLATION

Now to less ethereal matters, wherein I would like to pose a conundrum that has caused me professional distress from time to time, and to which I have yet to find a solution.

Consider the following hypothetical situation. You are responsible for advice on the loss reserving and pricing of an insurer in a line of business in which the state has a political interest, e.g. motor vehicle bodily injury (MVBI). These examples are especially clear in Australia and in the United States of America, which are federations of states that may each operate distinct MVBI and workers' compensation schemes.

You have analysed the insurer's claims experience, and detected dramatically high superimposed inflation, let us say of the order of 20% p.a. in respect of claims in the medium cost range, less in respect of other claims, but such that claim costs over the whole portfolio are growing at a rate 6% p.a. in excess of 'normal' inflation.

For brevity, I shall refer to this as just 'the 6% trend', though recognising that it may have a much more complex sub-structure than an increase that affects all claims uniformly.

Suppose that your analysis shows this feature of the experience to be irrefutable to within a relatively small tolerance, and to have persisted for three years without sign of abatement. Suppose that the increase in costs is not just a mysterious abstraction, but its causes can be identified, as, say, increasing frequency of claimants' success in achieving awards under particular heads of damage.

How should you allow for this trend in forecasts of future claims experience?

There are at least two powerful forces that require consideration in the framing of an answer.

First, there is the observation that what has persisted in the past is likely to continue in the future unless there is some specific and identifiable counter-force. Suppose the latter does not exist in the present case. One is then faced with simple extrapolation of the 6% trend.

Suppose that this increases the loss reserve by 20%-25% (relative to a basis which allows for no superimposed inflation), and the premium rate for next underwriting period by a similar percentage plus another 10%-12% to allow for the delay from the present to the occurrence of the underwritten claims. The former of these conclusions may have devastating consequences for the insurer's financial condition. Further, an increase in rates of the magnitude indicated might cause substantial erosion of the insurer's market share.

One should not shrink from difficult conclusions of this sort if they reflect a likely outcome. But do they? Here we might pause to consider the second powerful motive force that may bear on the situation.

It is highly likely that the continuation of the 6% trend for any lengthy period is politically unsustainable. After all, it implies a doubling of costs in real terms each ten years.

The political imperatives may be such that action aimed at reducing claim costs, e.g. modification of the legislation governing the insurance in question, is virtually inevitable. In this case, indefinite continuation of the 6% trend becomes an unlikely scenario, and forecasts based on it are of dubious value.

What about the alternative view? The view that anything other than a reduction over future years in the 6% rate of superimposed inflation is unreasonable may be valid, but it generates a host of questions. When exactly in future will the anticipated cost containment action occur? Will it reduce claim costs in a discrete step (i.e. a spike of negative superimposed inflation), or will the effect be more gradual? In the former case, what will be the trend in claim costs after the spike? Will the 6% trend re-assert itself, but at a lower level of claim size? Will cost containment measures affect only newly incurred claims, while older claims are left to run their course?

Questions like this render any nominated scenario for diminished future superimposed inflation just as lacking in substance as the continued 6% trend is unrealistic. For example, one might argue as follows:

- the long-term historical rate of superimposed inflation has been 3% p.a.;
- this is a reasonable average to assume for the future; and
- the reversion to long-term mean is unlikely to occur instantaneously, and it is reasonable to assume continuation of the recent 6% trend for some future period.

This argument might command general agreement as far as it goes; but its conversion into quantitative form is problematic. One might assume, for example, rates of superimposed inflation over future years equal to 6%, 6%, 5%, 5%, 4%, and 3% thereafter. But this is surely arbitrary. Why two years at 6%? Why not one, or three? In short, how can one justify any specific projection of future superimposed inflation?

The two forces bearing on this situation generate my conundrum in the form of two questions:

- Is it in any way reasonable to damage an insurer by carrying out financial forecasts on the basis of an extrapolated trend when one can fairly confidently assign it a probability of virtually zero?
- In the absence of any clear guidance as to when and how that trend will be interrupted, how is one justified in any lesser forecast?

I do not have an answer to these questions.

INSURANCE COMPANY FINANCIAL REPORTING

An interesting clash of actuarial sub-cultures occurs between those groups I might term the 'gradualists' and the 'revisionists' in their respective approaches to loss reserving. Let me describe these groups.

It is not appropriate to do any mathematics here, but it will be helpful to introduce some simple notation. Let $L(t|I(s))$ denote an estimate of loss reserve at time t , based on information $I(s)$ up to time s . Now consider the transition from one balance date t to the next, $t + 1$. The estimated loss reserve changes from $L(t|I(t))$ to $L(t + 1|I(t + 1))$.

The loss reserves at the different dates relate to different bodies of claims. For comparison, it will be helpful to extend the notation slightly by writing $L_u(t|I(s))$ to include only claims incurred up to time $u \leq t$. Then $L_t(t|I(t))$ and $L_t(t + 1|I(t + 1))$ are comparable in the sense of relating to the same body of incurred claims.

Moreover, the later estimate $L_t(t + 1|I(t + 1))$ implies a 'hindsight estimate' $L_t(t|I(t + 1))$ relating to the earlier balance date. Now $L_t(t|I(t + 1))$ and $L_t(t|I(t))$ are directly comparable. The latter is the estimate of liability made at time t , and the former the estimate of the same quantity as it would have been made if the information at time $t + 1$ had been available at time t .

The quantity $\Delta = L_t(t|I(t + 1)) - L_t(t|I(t))$ is the quantum of hindsight revision of last year's estimate, and will flow directly to the insurer's bottom line (with sign reversed). Large hindsight revisions will contribute to high volatility in insurer profit.

Leaving aside cases in which estimation is simply poor (i.e. the form of L is poorly chosen), revisions occur because the information $I(\cdot)$ conditioning

the estimate changes over time. For example, superimposed inflation may emerge in claim payments after years of quiescence.

The gradualists are those who argue that large hindsight revisions should not be allowed to occur. The revisionists are those who believe that, once the full information $I(t + 1)$ is taken into account, the cards should be allowed to fall. The argument here is that abrupt revisions do no more than reflect abrupt changes in conditioning information.

The notational framework is suggestive of Bayesian concepts, and these can certainly assist in containing the magnitude of hindsight revisions. They cannot prevent them, however.

Moreover, the human response to a situation may operate to increase volatility. A typical scenario of adverse claims experience might run as follows. Some years of stability are followed by a year whose experience hints at adverse change. A full Bayesian approach would give partial weight to this. However, management may resist, with arguments such as: "Unless the experience is conclusive, we do not wish to presume unfavourable change."

Another year of adverse experience follows. The Bayesian approach would give further weight, but still there is scope to argue that the observed features of the experience are in some way temporary. Classic arguments would be that: "In the latest year, management has implemented a drive to settle a greater number of claims than usual", or, more subtly: "The claims department has shifted its focus towards the disposal of the larger claims."

A third year of adverse experience follows. The excuses are now exhausted. All accept the experience for what it is, but, unfortunately, the Bayesian estimate of liability has by now diverged disastrously from that recognised by the insurer, requiring a substantial correction.

In circumstances such as these the gradualists and revisionists part company in their opinions on appropriate action. The former group believes that loss reserves should be constrained in some way that will force the profit stream towards greater stability. The actuary may be informed by the management that it is his role to 'manage the reserve', a concept perhaps reminiscent of managing a life office estate.

My representation of the gradualist position probably overlooks some of its finer points, since it is obviously objectionable as I have expressed it. According to accounting principles, profit is a derived quantity that follows from balance sheet items (e.g. loss reserves), and must not be smoothed. Presumably, the gradualist position involves a subtler argument about the need for smooth time series of loss reserves.

But, however the arguments might be phrased, ultimately they amount to the gradualists seeking to suppress or to contain volatility, and the revisionists allowing it to emerge.

One might reasonably enquire into the motivation for containment. If insurance is a volatile business, why should this not be manifest? We do not

expect a minerals exploration company, for example, to produce a steady profit stream. That is not its nature. Why are insurance companies different?

The explanation given to me has usually been the lack of sophistication of the investment community; that market analysts, for example, expect low-volatility profit streams from insurers, and will deal severely with non-conformists.

But, if this is the sole explanation, the argument seems circular. We are arguing that the presentation of an insurer's financial status needs to be distorted to accommodate public prejudice, while in doing so we feed that prejudice. How is the investment community ever to slough off the skin of its supposedly false beliefs if we, as actuaries, institutionalise the encouragement and sustenance of that belief system?

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