The importance of history in actuarial education

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Summary

Let me begin with a summary of my thesis, remembering that my main question is whether the teaching of investment principles (Part IIB) should be approached from a historical perspective rather than a mathematical one. The need for a historical perspective may be a minority view. However, I detect the beginnings of change in academic circles in finance and economics which overlap this field – for example, there are signs that economic history is beginning to recover in importance as an academic discipline.

It does seem to be accepted that actuaries need relevant experience and events such as the Crash of 1929 and the GFC of 2008 do not happen every few years. In investment topics, the only practicable way of imparting this experience is second-hand, through historical study of these events, to the extent that they are relevant. Of particular importance are speculative bubbles.

Actuaries also need to be able to play a preventative role if they aspire to important senior roles in government, regulatory bodies or financial institutions. The second reason for including history in any study of capital markets, as argued by experienced journalists and economists such as JK Galbraith (1975) and Trevor Sykes (1978), is that the recollection of events such as the Wall Street crash of 1929, or the Poseidon boom of 1969/70 helps prevent their recurrence.

A third point, which goes beyond investment topics is the nature of historical study itself which tends to ask why something happened, not just what and when. To quote EH Carr (1964), writing in *What is History*: *"history is the study of causes"*. With its emphasis on probability, mathematics and statistics, actuarial modelling tends to be based on correlations. If something does not fit the data, it seems natural for actuaries to improve the fit by adding a more sophisticated mathematical feature. Valid modelling however, needs to be based on causal laws. If we do not know why something happened to cause a particular pattern in our data, then we are looking at a historical regularity, not a causal law.

History and mathematics

The issue of causation, versus regularities, is thoroughly argued elsewhere including the classic philosophy text *What is this thing called Science?* by Alan Chalmers, so I do not wish to dwell on this too much. However, let me draw your attention to the challenge to the economics profession issued by HM Queen Elizabeth II at the London School of Economics in 2008: why had so few economists seen the GFC coming?

There was more than one reply including a letter written by 10 economists led by Geoffrey Hodgson (2009). This letter deals with economists and economics, but I did wonder if the criticisms were equally applicable to actuaries and actuarial science. They wrote:

> *We believe the narrow training of economists – which concentrates on mathematical techniques and the building of uncontrolled formal models – has been a major reason for the failure of our profession. This defect is enhanced by the pursuit of mathematical technique for its own sake in many leading academic journals and departments of economics.*
>
> *There is a species of judgement, attainable through immersion in a literature or a history, that cannot be adequately expressed in formal models. It's an essential part of a formal education in economics, but has been stripped out of most leading graduate programmes in economics in the world, including the leading economics departments in the United Kingdom.*
>
> *Models and techniques are important. But given the complexity of the global economy, what is needed is a broader range of models and techniques governed by a far greater respect for substance, and much more attention to historical, institutional, psychological and other highly relevant factors."*

These 10 economists acknowledge that what they had to say was a minority view. There has never been much history in actuarial science and economic history departments had all but disappeared in the last 40 years. I say "had" because I think I have detected the germination of a few economic history seedlings in Melbourne and the Part IIB syllabus specifically mentions "*speculative bubbles*".

History as a second-hand substitute for experience

My main argument for including a historical perspective is its role as the only practicable way of imparting relevant experience. Last year Graham Cocks, an experienced asset consultant and also a senior fellow in the Department of Finance at Melbourne wrote an interesting paper entitled *Investment Expertise: Why there is a lack of it and how it might be developed.*

The type of expertise sought by Cocks was that required by fund managers rather than actuaries, but there is considerable overlap. In his attempt to identify how expertise is developed, Cocks' discussion ranged over a number of fields such as medicine, air traffic control and fire-fighting. He repeatedly makes the suggestion, in various words, that as well as formal learning, expertise requires practice and experience.

The kind of practice to which Cocks refers conjures up images of simulated trading rooms. However, in Part IIB our problem is much easier – we can, for example, ask for a live assessment of the risk(s) inherent in current market levels, we can examine live yield curves, we can use live market data when requesting a suggested asset allocation for (say) a closed inflation linked pension fund, we can ask students to analyse recent financial statements. [Perhaps we can even ask the same questions every year, knowing that the answers will probably be different.]

Experience is more difficult to acquire. We might think that spending two hours every week of the semester in a trading room, attending investment committee meetings or even working beside a financial journalist would be ideal. Unfortunately, unless the semester includes an event such as the crash of 1987, the TMT bubble or the GFC, practical experience will do little to equip students for such events of the future.

If we wish to turn out a crop of trained actuaries every year, we cannot delay their final exams until they have been through the next bubble, so learning from history is the only practicable alternative. Also, I think there are advantages in learning from history rather than real events because all historical crashes are different. As well as understanding the common causes, there will be interesting differences to consider such as the role of derivatives in 2008 compared to 1929.

There have been several occasions when I thought a sense of history would have been beneficial to the author of an actuarial report – and I'll use old examples to limit the embarrassment.

As a recently graduated actuarial trainee in 1969/70 I was working on the valuation of a defined benefit pension fund. This was at a time when the population was embroiled in reckless speculation in mining shares – an era now named after its star performer – a nickel prospecting company known as Poseidon NL – whose shares rose from a few cents to $280 based on a nickel deposit that proved very disappointing, to say the least.

Having worked on valuing the liabilities, I was asked to read the whole report, including its comments on assets. There was one comment that was to stick in my memory: the observation that because the source of the stock market appreciation was so fundamentally and soundly based on new mineral discoveries, it was likely to remain permanent. So was this, I remember thinking, "actuarial judgement", which I needed to master?

Almost 20 years later Australia became involved in another stock market boom of a somewhat different nature, the so-called entrepreneurs of 1987. A paper by Solomon and Bone (1987), concluded (my emphasis):

> *"We argue that perhaps the only way to deal with the surplus effectively in the short to medium term is legislation to allow recovery of surplus by employers in appropriate circumstances. We believe the Institute should act **as a matter of urgency** to develop a basis for surplus recovery with which its members are comfortable, rather than wait for the surplus issue to be resolved by those less capable."*

As we now know, the problem was indeed solved by "those less capable" who simply caused a stock market panic which exposed the excessive equity prices at the time. There was, however, one discussant who questioned the basic assumptions:

> *"The extent to which the rise in capital assets [over the preceding 3-4 years] is 'real', is very much in question. I think if you have them in Japanese assets, it may be even more of a question."*

Another source of embarrassment is some of the articles which appeared in Actuary Australia shortly before the GFC advocating 100% investment in equities for retirees – see, for example, the article by David Kerr in the November 2007 edition. One hopes that anyone who retired shortly before the GFC, did not take this advice, although there were no doubt numerous sad cases.

I mention these examples, and actuaries' comments at the time, to illustrate the point that, at least as far as investment education is concerned, there could be something seriously lacking from the actuarial curriculum. All of these reports, papers and articles were written by actuaries with many years experience. This reinforces one of Cocks' points that experience, by itself, is a necessary, but not sufficient, pre-requisite for developing expertise.

Another essential ingredient, in my view, is the ability to make a clear distinction between price and value, especially when it comes to shares and property. The speaker who questioned market levels during the discussion of Solomon and Bone before the crash of 1987, clearly had such a distinction in mind.

The question of valuation methods and their limitations is also in the syllabus for Part IIB. However this notion suits uneasily with many sections of academia where, for many years, the prevailing paradigm has been efficient markets. A couple of years ago I traced how this view has also become entrenched in the actuarial profession. Like the re-emergence of the teaching of economic history, my antennae also detect that such uncritical acceptance of semi-strong form EMH is also waning. If we have learned nothing else from the GFC, should we not at least question market efficiency and ensure graduates are exposed to alternative points of view?

In 2003 the Reserve Bank of Australia devoted its annual economic conference to the question of asset price bubbles and whether central banks, etc should attempt to intervene. The after dinner speaker was the veteran journalist Trevor Sykes (2003) who spoke about the wild speculation in tulips in Holland almost 400 years ago. Sykes concluded his speech with the following comments:

> *"We can laugh at the stupidity of the Dutch, but they can be forgiven. The world had never seen such a crazy boom before.*
>
> *Today we have no such excuses. There have been booms of some sort in nearly every decade of the past two centuries.*
>
> *If the rest of us had properly learned what happened in the tulip boom, I suggest there would have been fewer booms and fewer disastrous busts. But every generation since has thought that the tulips were irrelevant, and they're not. Every lesson we need to learn about booms, about derivatives, about gearing, is all there waiting to be learned.*
>
> *Which brings me back to where I started.*
>
> *If scientists and engineers didn't learn from history every generation would be condemned to reinvent the wheel. But scientists and engineers do learn*

> *from history, and so we have heart transplants and men walking on the moon. But when it comes to finance, every generation starts afresh with flint axes."*

The timing of the 2003 Reserve Bank conference event suggests that some authorities were, at least, aware of potentially mispriced equity and property markets. Maybe we have this awareness to thank, partly, for the way the GFC was handled in Australia.

History as preventative memory

This brings me to the second (and final) point of my thesis: the preventative value of historical study in this field. When writing of the Poseidon boom, Trevor Sykes (1978) expressed the hope that:

> "*This book is a history of [the 1969-70 mining] boom, written in the hope that if the Australian public understands what happened in 1969-70 they will be better prepared for the next boom.*
>
> *Because there will certainly be another."*

Galbraith (1975) made much the point in his classic text - *The Great Crash 1929*:

> *"The story of the boom and crash of 1929 is worth telling for its own sake. Great drama joined in those months with a luminous insanity. But there is a more sombre purpose. As a protection against financial illusion or insanity, memory is far better than law. When the history of the 1929 disaster failed, law and regulation no longer sufficed. For protecting people from the cupidity of others and their own, history is highly utilitarian. It sustains memory and memory serves the same purpose as [regulation] and on the record, is far more effective."*

Conclusion

My main proposition is that, at Part II level, we need to build a historical perspective into investment (and ERM?) coverage and not just treat investment as a specialised branch of applied mathematics.

There is plenty of interesting material and a formal structure offered by economic historians such as Kindleberger (2000). At the broader level we have the tulips of 1635, Wall Street in 1929 and the GFC of 2008; there are also more isolated events that are closely related to topics such as derivatives and option pricing covered earlier in the actuarial syllabus such as Long Term Capital Management, UK pension funds and Equitable Life.

The aim of such a historical perspective is:

(i) to provide a substitute for experience (which may even be superior to real experience given the infrequency of atypical events),

(ii) to instil an awareness of speculative bubbles and their aftermath which encourages prevention (at the most senior level) and/or avoidance (at the firm and personal level), and

(iii) to improve the identification and critical analysis of underlying assumptions in actuarial models, particularly those relating to risks and investment returns.

Achieving such a perspective within university actuarial departments may not come easily because it could require a type of learning and assessment that is unfamiliar to actuarial students. For example, the recollection of checklists of types of "risk" or assumptions underlying a model, which tend to reproduced parrot-fashion, need to replaced with problems or essays that are much higher on the Bloom's taxonomy scale rewarding understanding (eg of model limitations) rather than memory of a list of points to be taken into account.

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