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Citation for published version

Thomas, R. Guy and Smith, A.D. (1998) Positive theory and actuarial practice. *The Actuary*, 1998 (8). pp. 16-17. ISSN 0960-457X.

DOI

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Positive theory and actuarial practice

Guy Thomas & Andrew Smith

"In this dice example, the odds are easy to figure. Calculations involving monster hurricanes and earthquakes are necessarily much fuzzier, and the best we can do at Berkshire is to estimate a range of probabilities for such events. The lack of precise data, coupled with the rarity of such catastrophes, plays into the hands of promoters, who typically employ an "expert" to advise the potential bond-buyer about the probability of losses. The expert puts no money on the table. Instead, he receives an up-front payment that is forever his no matter how inaccurate his predictions. Surprise: When the stakes are high, an expert can invariably be found who will affirm -- to return to our example -- that the chance of rolling a 12 is not 1 in 36, but more like 1 in 100. (In fairness, we should add that the expert will probably believe that his odds are correct, a fact that makes him less reprehensible -- but more dangerous)."

Berkshire Hathaway, Chairman's Letter to Shareholders 1997.

In recent months, the actuarial profession has seen a debate about how financial theory ought to be developed and applied. This has been essentially a normative, philosophical exercise, imposing a view of how actuarial practice *should* progress. In this article we outline an alternative approach to understanding and explaining actuarial practice. The approach is positive rather than normative: it observes actuarial practice and the theories on which it is based and seeks to explain why these practices and theories prevail, rather than offering prescriptions for theories which *should* prevail. We use 'theory' in a broad sense to refer to actuarial thought and argument in general. This terminology is borrowed from financial accounting, where the approach we describe is known as *positive accounting theory*.

An example

As an actuarial example of the distinction between normative and positive theory, suppose that we wish to improve our understanding of why different actuaries may use a wide variety of assumptions to value similar long-term liabilities. If we wanted a normative answer, we could ask them each to provide an 'actuarial' justification of their approach; their replies would probably be couched in terms of views concerning the long-term values of economic parameters. These views constitute normative theory, because

- they cannot be confirmed or refuted by data (the long term means a time so far ahead that it is impractical to apply any objective tests);
- they involve prescribing a 'right' approach.

Positive theory, on the other hand, would not be concerned with prescribing a 'right' approach. It would involve observing the environment in which actuarial decisions are made, and seeking to model that environment and generate hypotheses which could be tested against data. We might consider factors such as:

- economic incentives faced by the actuary;
- risks faced by the actuary, such as legal liability, professional censure, or the loss of the client;

- the range of normative theory available to the actuary to justify different decisions.

For example, we might hypothesise that pension scheme funding levels as reported in company accounts are correlated with the strength of the disclosed funding basis. The two essential features which make this a positive rather than normative theory are

- it can be confirmed or refuted by reference to data;
- it says nothing about whether, if the theory is true, this is a good or bad thing.

The market for excuses

In the accounting literature, positive theory has come to be associated with a distinctive view of the evolution of regulation (broadly defined). This view observes that normative theories may be used as much for advocacy as for illumination. Changes in regulation, actual or threatened, are therefore an important stimulant of demand for normative theories.

For example, proposals to revise accounting standards for pension costs lead to demand for normative theories which support particular interests. Recourse to normative theory provides a more effective lobbying strategy than simple declarations of self-interest. Different theories are demanded by different vested interests. This demand for normative theories to support particular interests constitutes one side of what has been called the “market for excuses”.

Given the demand which regulation creates for normative theories, where does the supply come from? Practitioners have an obvious incentive to supply theories which support the interests of their clients or employers. Academics are also a source of normative theories; they have little direct incentive to meet the needs of vested interests, although by doing so they may increase their chances of enjoying industry research funding and other indirect benefits (such as being widely quoted, or greater ease of publication in professional journals).

These observations need not impugn the motives of either practitioners or academics: both may produce their theories purely for intellectual motives, with no regard for vested interests. However, the tendency of vested interests to quote theories which support their positions produces a survival bias: theories which are adopted by vested interests are more effectively disseminated than those which are not.

Normative and positive theory		
	<i>Normative theory</i>	<i>Positive theory</i>
<i>Aims</i>	Prescriptions for practice Induction (codification of practice) Deduction (premises to prescriptions)	Explanations of practice Observation Generation of hypotheses
<i>Methods</i>	Little testing	Emphasis on testing
<i>Uses</i>	Standardisation of practice Training for practice Market for excuses	Better understanding Better predictions

Consequences

Two interesting consequences follow. First, to the extent that normative theories are stimulated by the demand for excuses, we would expect theory to follow where the political or regulatory agenda leads. In practice, we can observe many instances where this appears to be the case. Some recent examples are:

- political concern with discrimination in insurance pricing, leading to numerous papers on underwriting;
- proposals to change accounting standards for pension costs, leading to a flurry of effort to defend traditional actuarial approaches, or argue for alternative approaches;
- the emergence of ‘orphan estates’ as a political and media issue, leading to efforts to justify distributions more favourable to shareholders than a 90:10 basis.

In each case, the order of events can be seen as the inverse of the normative paradigm in which “correct” theory advances knowledge, and policy proposals follow from it.

A second consequence of normative theories’ role as excuses is that whether a theory proves true or false in the long term may not be a particularly relevant factor in whether its originators prosper or not. Much actuarial work is ostensibly about creating visions of the long term, but those visions are often calibrated to permit the achievement of objectives in the short term (a contribution holiday; a benefit improvement; an increase in reported profits). Even for an actuary, being right in the long term may be largely irrelevant to being successful in the present. (This temporal mismatch between the substance of actuarial debate and the objectives of participants in debate has many interesting implications, which merit further study.)

Characteristics of demanded theories

This view of regulation suggests that there is likely to be little demand for theories which do not support vested interests. For example, financial economics in its pure form abhors “free lunches”: the best that can be hoped for is that changes in financial strategy will make one group better off and another worse off. Lobbyists often find that this is not a politically acceptable way of justifying their objectives. Hence pure financial economics is not demanded, and the demand instead is for bespoke theories which say that a change in financial strategy produces a free lunch. Examples of such theories include:

- the use of 'shareholder value' measures for executive remuneration, which do not reconcile to market values;
- arguments that orphan estates can be distributed to shareholders without making participating policyholders worse off;
- the argument that financial reinsurance of with-profits business can provide a margin to a reinsurer while still enhancing returns to all generations of participating policyholders.

We should not be surprised to find a large number of such theories: every vested interest needs a theory, and theory is cheap to produce. The multitude of substitutable alternative theories and the lack of consensus may be intellectually discouraging; but they are also important ingredients for a thriving market in actuarial consultancy.

Life assurance solvency

For a topical example of lobbying on the basis of normative theory in preference to declared self-interest, consider the case of solvency regulation and financial reporting for certain classes of life assurance business. Hypothetically, let us suppose that statutory reserving bases were strengthened for unitised with profits business, or that derivatives underlying some innovative higher income bonds were declared inadmissible. This might make insurance policies a better credit risk; but it might also lead to reduced competition, higher barriers to new entrants and higher prices. This range of effects would clearly be to the benefit of large life offices. However, the supplied actuarial theory does not encompass the self-interest of larger life offices; instead, our attention is drawn only to the importance of improving the credit-worthiness of insurance policies. Empirically, it is hard to establish which effect is more significant to the interests of consumers - better credit risk or reduced competition. However, we can observe that the clamour for stronger bases seems to be coming mainly from large life offices.

Implications for research

We noted above that theories produced by academics might sometimes be adopted to support particular interests. However, it is also common for actuarial practitioners to complain that much academic research is ‘not relevant’. Academics need not necessarily be discouraged by this; indeed, perhaps they should regard the epithet ‘not relevant’ as a back-handed compliment. If practitioners dismiss your research as ‘not relevant’, at least you know it is not an excuse!

Alternatively, if academics do want to be 'relevant', positive theory offers a means of focusing academic attention on the study of actuarial practice as it is, rather than normative models of how it should be. It allows relevance to be combined with independence.

Uses of theory

Normative theory does of course have other uses apart from supplying the market for excuses. It helps to standardise practice, for example by codifying pension funding methods. It also has a pedagogic role, in that it facilitates the teaching of practice in a more coherent manner. (For example, the syllabus content for the later professional examinations consists largely of normative theory.)

In what ways might positive theory be useful? There are two main answers. First, the intellectual justification: positive theory may help us to understand the world as it is, and for some this is justification enough. Second, models derived from observed behaviour may facilitate better predictions than normative models. A positive model of how actuarial decisions are actually made may sometimes give superior insight to a normative model of how they are supposed to be made.