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Paradox, accounting values, and intelligible regulation

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ABSTRACT

Expected utility theory, which includes estimating the probabilities of uncertain future outcomes, is the classical model for rational economic decision making, and, by implication, rational valuation and financial reporting regulation. In Wittgensteinian terms it is a 'hinge' of the language game in which these practices are embedded. When rendered explicit, however, this 'hinge' appears to be formally incoherent. The exploration of this problem has consequences for all of our arguments over the epistemological underpinnings of accounting reports – whether realist, representational, constructivist, or otherwise.

Arguably, there are two complementary primitive models that underlie real-world probability estimation. Taken together, they generate a version of Goodman's inductive paradox (other versions of which also arise for non-inductive empirical generalisation). This, in its turn, is related to Kripke's paradox, which arises when we try to give behavioural accounts of rule following, and so of participation in a language game.

This paper explicates this type of paradox in the context of commercial decision making, and considers its consequences. The existence of paradoxes should render the system that generates them completely incoherent, but (paradoxically . . .) they seem to be generated by any attempt to give complete accounts of some of the normative fundamentals which underlie linguistic practice – such as truth-telling, validity and rule-following.

Whether or not these paradoxes represent a serious threat to the coherence of the empirical or behavioural sciences, it might be objected that commercial decision making methods and financial regulation rarely aspire to the kind of rigour that these disciplines attempt to achieve. Part of the argument of this paper will be that the intelligibility of commercial language suggests an approach to these paradoxes which is not obvious from more traditional philosophical perspectives.

The intentionality of belief renders certain belief claims by participants in a shared language game incorrigible (within the game), in the sense that they can be doubted only by doubting the seriousness or quality of participation. If certain statements about rule following and word meaning have this same quality, then there is a way of avoiding the consequences of Goodman's and Kripke's paradoxes, and of sterilising the probability estimation paradox for any playable commercial language game.

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1. Expected value and accounting valuation

Within the paradigm of classical economics, the claim that a decision is 'rational' is a claim that it can be defended in terms of expected utility theory. The related valuation model is taken for granted by accounting standard setters to the extent that it can be referred to almost without explanation as it is in FASB Concept 7 (Financial Accounting Standards Board,

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American Institute of Certified Public Accountants 1982; 2008) or in IASB ED2010/1 'Measurement of Liabilities in IAS 37' (International Accounting Standards Board, 2010), which states:

> "If the outflows of resources required to fulfil the obligation are uncertain, the entity would estimate their expected value, i.e. the probability-weighted average of the outflows for the range of possible outcomes. The expected value is unlikely to be the amount that an entity ultimately pays to fulfil the liability. But the Board believes it is a relevant measure for capital providers, who would consider all possible outcomes and their relative probabilities when assessing the effect of a liability on the value of their claims to the entity's resources." (p. 7)

The tension between this requirement (which generates a valuation 'unlikely to be the amount that an entity actually pays') and any number that might be the product of traditional book-keeping processes gives some measure of the role of expected value in the cognitive schemata of accounting regulators.

One element of an expected value computation is an estimate of the probabilities of the various possible outcomes of the choices that are available (Bernoulli, 1954).

2. Two models of probability appraisal

The defendable[1] methods for estimating probabilities fall (arguably) into two classes, which I will call (1) 'engineering' approaches and (2) 'statistical' approaches.

An engineering approach depends upon the construction of a (more or less) formal model of the system whose behaviour we wish to predict, and on being able to deduce the determinate and indeterminate aspects of that behaviour from features of the model. A simple example is the 'engineering' model of a die tossing event which has, as one of its consequences, the 1/6th probability that the die will land on any given one of its sides.

The statistical approach depends on estimating the behaviour of a subject probabilistically by testing a sample of subjects of a relevantly similar type. This approach is sometimes used to study 'information rich' systems such as large human populations, which it is impractical to model.[2]

With respect to risk management, either of these methods may allow the calculation of the probabilities required for the computation of expected values, and, therefore, for making economically rational choices (in the classical sense). The first part of this paper will not focus directly on the practical aspects of constructing the appropriate engineering models, or carrying out the appropriate statistical studies – nor will it address the related study of 'bounded rationality' (Simon, 1947, and exegesis). Neither will it focus directly on the contentions surrounding categories such as 'economic rationality' or 'rational choice' or 'economic value'. Important as these difficulties and debates are to the issue in question, its main focus will be a formal feature of these two approaches to probability estimation as they are represented here. The paper will consider their rationality in their own terms, and then go on to consider the consequences of the outcomes of this investigation for some other related problems.

Expected utility theory provides the formal framework for classical approaches to finance theory and to an important set of approaches to accounting valuation recognised by standard setters. While asset valuations based on discounted expected values are recognised to be beyond the reach of *practical* estimation techniques, the aspect of their *formal* incoherence outlined here is rarely commented on. The resolution of this incoherence has consequences for accounting regulators' attempts to draw the boundaries of what counts as an intelligible accounting report, as well as for the 'rationality' of risk management.

2.1. The rationality of system modelling

The engineering approach to calculating probabilities is unexceptionable, so long as it remains abstract. The mathematical model of a die-tossing event from which probable outcomes can be calculated embodies no special mysteries. However, using this approach to estimate *real world* probabilities immediately gives rise to a difficulty.

In order to use engineering models to calculate 'real' probabilities, we must construct these models in a way that ensures that their behaviour closely matches the behaviour of the systems that we wish to manage. This is a reasonably straightforward business for simplified physical systems, such as tossed dice and pennies, which is why these systems appear so often as examples in textbooks on probability. Consider, however, how we might use the engineering approach to model

[1] There has been significant debate in the philosophical and economic literature on the 'nature' of probability (see Mcgoun, 1995, for a useful summary). For the purpose of this paper, subjective or implied probability attributions will not be considered – the main focus will be on probability attributions which are supported by an explanation, a demonstration, and/or a calculation. The 'engineering' approach is roughly equivalent to McGoun's 'classical' probability, and the 'statistical' to his 'relative frequency'.

[2] As indicated a little later, it can be argued that the statistical approach makes certain 'engineering' type assumptions about the system whose behaviour is being predicted. One could take a statistical approach to estimating the behaviour of a die, for instance, but only if the regularities that were being estimated were, for example, expected to be consistent *over time*. This assumption depends on the underlying system having certain features (e.g. that the die does not contain a clock which affects its behaviour). As will be clear from the remainder of the paper, however, the argument works whether or not this is taken into account: it is just more intuitively acceptable if it does not depend on a (perhaps possible, but certainly much more opaque) argument that statistical approaches can be 'reduced' to engineering approaches.

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