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Assessing game theory, role playing, and unaided judgment

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Abstract

Green's study [*Int. J. Forecasting* (forthcoming)] on the accuracy of forecasting methods for conflicts does well against traditional scientific criteria. Moreover, it is useful, as it examines actual problems by comparing forecasting methods as they would be used in practice. Some biases exist in the design of the study and they favor game theory. As a result, the accuracy gain of game theory over unaided judgment may be illusory, and the advantage of role playing over game theory is likely to be greater than the 44% error reduction found by Green. The improved accuracy of role playing over game theory was consistent across situations. For those cases that simulated interactions among people with conflicting roles, game theory was no better than chance (28% correct), whereas role-playing was correct in 61% of the predictions. © 2002 International Institute of Forecasters. Published by Elsevier Science B.V. All rights reserved.

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1. Introduction

In Armstrong (1997a), I reviewed *Co-opetition* by Brandenburger and Nalebuff (1996). Their use of game theory to analyze real-world situations seemed compelling. I concluded that it was unfortunate that the decision makers had not engaged the help of game theorists before they made their decisions. I had some misgivings about the book, however. For example, was there any evidence that game theory had led to better decisions or predictions in conflicts? So I contacted the authors. Brandenburger responded that he was not aware of any studies of the

predictive validity of game theory, and I was unable to find any such studies.

Many hundreds of academics have been working on game theory for half a century. Thus, it seems strange that finding evidence on its predictive validity is difficult. Imagine that hundreds of medical researchers spent half a century developing drugs without testing whether they worked as predicted. They would not be allowed to market their drugs.

Kesten Green sent me an early draft of his paper in July 2000 (Green, 2002). I thought it was an important contribution because he: (1) described an important problem, (2) challenged existing beliefs, (3) obtained surprising results, (4) used simple methods, (5) provided full disclosure, and (6) explained it all clearly. In

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short, Green violated all the rules in the ‘Author’s Formula’ (Armstrong, 1982). That formula, based on a review of empirical research, was updated in Armstrong (1997b). Given Green’s violations of the formula, I expected that reviewers would reject the paper. To avoid rejection, with the permission of Jan deGooijer, Editor of the *International Journal of Forecasting*, I informed Green that his paper would be accepted, subject to reasonable responses to any substantive reviewers’ concerns.

Green had been systematic in his own evaluation of his study. He rated the study on the 32 principles for the evaluation of forecasting methods from Armstrong (2001c). His study did well on 28 of the principles, poorly on three, with one judged as not relevant. I have reviewed these ratings and am in agreement. The ratings are at kestengreen.com/ratings.pdf.

I discuss whether: (1) the problem is important, (2) the findings are important, and (3) the study was done in a competent manner. I then provide suggestions for further research.

2. Important problem?

Green’s problem can be stated in two parts: Is it useful to accurately forecast the decisions made by parties in conflict? If so, which method can best improve upon the way that people currently forecast such decisions?

With respect to the first question, it seems that by better predicting the decisions of one’s adversary in a conflict, one can make better decisions. For example, in 1975, Britain refused to sell the Falkland Islands to a group of Argentine investors backed by the Argentine government. As a result, it had to fight a war to defend its ownership, which was clearly a less profitable alternative for Britain than selling the islands. The three Argentine generals involved had not anticipated Britain’s response to Argentinian troops occupying the Falkland Islands. They lost the war and their jobs.

Predictions of decisions might also be of interest to parties outside a conflict. For example, in the case involving the negotiations between the National Football League owners and the Players Association, an insurance company offered the players strike insurance. To do so, it had to forecast the likelihood that the players would decide to strike.

With respect to the best method to use, Green examined some of the more important methods that have been recommended for such situations. For example, game theory is often suggested as a way to predict the behavior of rational decision makers, and we have ample evidence from economics that predictions of rational responses are often accurate, even when surprising.

The problem of predicting decisions in conflict situations is important.

3. Important findings?

Green’s results show substantial differences in accuracy among methods. On average, the best method, role playing, had half the error rate of the worst method, unaided judgment, in predicting actual decisions. In five of the six situations, he found that role playing improved accuracy over other methods. These findings were obtained using over 1100 participants. Seldom in studies of forecasting does one encounter such large improvements in accuracy. For example, combining, which is regarded as one of the more important techniques in forecasting, reduces error by about 12% (Armstrong, 2001b). Green’s findings are important.

4. Competent science?

I examined Green’s use of the scientific method. Considering standard issues regarding scientific methods and issues raised by reviewers.

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