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
short, Green violated all the rules in the ‘Au-
thor’s Formula’ (Armstrong, 1982). That for-
ma, 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 Forecast-
ing, 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 evalua-
tion 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 kstencgreen.com/ratings.pdf.

I discuss whether: (1) the problem is im-
portant, (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 Is-
lands. They lost the war and their jobs.

Predictions of decisions might also be of
interest to parties outside a conflict. For ex-
ample, in the case involving the negotiations
between the National Football League owners
and the Players Association, an insurance com-
pany 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 situa-
tions. For example, game theory is often sug-
gested 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 con-
flict 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 fore-
casting, reduces error by about 12% (Arm-
strong, 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 review-
ers.
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