

## **Incentives for Developing and Communicating Principles: A Reply**

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The commentators raised many interesting ideas in response to Armstrong and Pagell (2003), from which one general theme emerges: The commentators claim that management science lacks the incentives to encourage efforts to develop and communicate grounded principles. As a result, academics often conduct their research as an intellectual exercise with little concern as to whether their findings might eventually be of any practical use.

The problem extends beyond management science. Smith (1991), an editor of the *British Medical Journal*, concluded from a review that only about 15 percent of medical interventions are supported by solid scientific evidence. He attributes this disconnect to an estimate that only about one percent of articles in medical journals are scientifically sound. Such results indicate problems with incentives in research.

### **Disincentives**

The discovery of new and useful grounded principles carries the message that the currently accepted procedures may not provide the best solutions. Some forecasting procedures, such as Box-Jenkins (Armstrong 2001) and game theory (Green 2002), have been shown to be of little value. Other procedures, such as unit roots testing in econometric forecasting, have little empirical grounding to demonstrate their value (Allen and Fildes 2001). Some researchers may be annoyed by these conclusions, especially given that they are based on empirical evidence.

The history of science shows that many disincentives to scientific advances exist. Those

who have made major advances have often been treated poorly. Kuhn (1962) claimed that when innovative findings conflict with important beliefs, resistance is likely to be strong and long lasting. For example, Richard Harrison's quest for an accurate timepiece, which was needed to determine longitude at sea, put him at odds with the scientific community of his day (Sobel 1995). Barber (1961) describes the fierce resistance met by famous scientists

Present-day examples are easy to find. The Danish statistician, Bjorn Lomborg (Lomborg 2001), was denounced by the Danish Committee on Scientific Dishonesty and by other groups largely because they do agree with his findings that the environment is improving (lomborg.com). This argument had been made initially by the late Julian Simon (1981), who had also been denounced by many academics. Emotion usually runs high on such cases, even among those who have not read Lomborg's or Simon's publications.

The evidence for resistance to findings is more than anecdotal. Laboratory experiments summarized in Armstrong (1996), show that scientists commonly resist findings that challenge existing beliefs. Typically they argue that the disconfirming findings are based on poor methodology.

I cannot claim to be a disinterested party in this matter, having devoted considerable energy to discovering and communicating grounded principles. I believe my findings have had a positive impact, and I am currently the most frequently cited professor in the Wharton School's Marketing Department. But the route I have taken has had perils. Some people regard my findings as heresies (see findings at <http://jscottarmstrong.com>). Reviewers have nearly always rejected what I think to be my most important papers. Thanks to interventions by editors, however, most of my papers have eventually been published. Some of my adventures with reviewers are described in Armstrong (1996). I suspect my commitment to principles has affected my internal promotional reviews at the Wharton School, especially in the late 1970s and the 1980s. Thanks to tenure, I still have a job. Fortunately, the administration and my colleagues have been supportive and done

much to help me in recent years. Even so, I am currently paid about half of the usual pay for faculty at my rank at Wharton.

### **Incentives**

Not all grounded principles are controversial, of course. But what is the motivation to work on refining accepted principles? In many cases, researchers go to great pains to show that their research is original. And journals look for “originality.” Findings that derive from prior work are not held in such high regard. At the extreme, reviewers have a low regard for replications, as noted by Hubbard and Vetter (1996).

Working on principles is time consuming. It is difficult to locate all the relevant studies and to translate them into useful findings. The job often requires reconciling conflicting results. It calls for an understanding of the conditions in the principles. Establishing principles is valuable work and it should be encouraged.

The commentators described a number of ways to improve incentives. Their suggestions have spurred me to join with others to take two related actions to encourage useful research on forecasting:

#### *Grants for Directed Research*

SAS has announced that it will provide two annual \$5,000 grants to the International Institute of Forecasters to support research directed at developing and testing forecasting principles. The funding process will focus on the research needs found on the Researchers’ page at [forecastingprinciples.com](http://forecastingprinciples.com), and the site will include details about how to apply.

#### *Invited Papers*

Recipients of an SAS grant will be invited to publish the resulting paper in the *International Journal of Forecasting*. The paper will also be subject to peer review in an effort to improve it. However, as is the case with the *Journal of Economic Perspectives*, which relies almost solely on invited papers, authors are

expected to seek peer review. I will also seek approval from the *International Journal of Forecasting* to make additional invitations.

In addition to these efforts to encourage research, the following steps are planned to improve the communication of useful findings:

#### *Informative abstracts*

The *International Journal of Forecasting* (IJF) will consider asking authors to provide abstracts that describe their findings and procedures. The commentaries by Ord, Uncles and Tashman offered support for this proposal.

#### *Reviews of papers with principles*

To make new findings more accessible to others, the “Research on Forecasting” section of the *IJF* is now encouraging reviewers to evaluate the papers in light of the forecasting principles summarized on [forecastingprinciples.com](http://forecastingprinciples.com). In addition, authors of recently published papers are invited to describe how their work contributes to forecasting principles, with the descriptions to be posted at the [forecastingprinciples.com](http://forecastingprinciples.com) site. The first posting, provided by Paul Goodwin, serves as a model.

#### *Educational materials*

Books that contain information relevant to forecasting principles will be identified on the “Text and Trade Books” page at [forecastngprinciples.com](http://forecastngprinciples.com).

#### *Special Interest Group pages*

Special interest group pages are being added at [forecastingprinciples.com](http://forecastingprinciples.com). The purpose is to provide the central source for those interested in forecasting in a particular area. Academics and practitioners are invited to host pages. Currently, Wil Gorr hosts a page on crime forecasting, and Kesten Green has a page on forecasting in conflict situations.

## **Future Prospects for Principles**

As Green mentions, more attention needs to be paid to assessing demand. With respect to the forecasting principles project, it would be useful to learn what principles have been used, and which of these have been useful. As a start, people who use the forecasting audit on [forecastingprinciples.com](http://forecastingprinciples.com) can provide their e-mail addresses so that we can send them questionnaires regarding their use of principles.

The International Institute of Forecasters is considering practitioner certification. This could be used to signify that people understand the forecasting principles and have some experience with them.

The increasing popularity of meta-analyses and the internet have reduced the cost of obtaining evidence on principles. In addition, the internet has provided the opportunity for people to learn about principles.

It is encouraging to see that similar projects have been successful. The Cochrane Collaboration ([cochrane.org](http://cochrane.org)) was formed many years ago for “Preparing, maintaining and promoting the accessibility of systematic reviews of the effects of health-care interventions.” In 2000, the Campbell Collaboration ([campbellcollaboration.org](http://campbellcollaboration.org)) was organized to find out “what helps, what harms, and based on what evidence” for problems in social, behavioral, and educational areas. In biology, the [facultyof1000.com](http://facultyof1000.com) classifies studies as “novel finding,” “technical advance,” “interesting hypothesis,” “important confirmation,” or “controversial findings”; they then rate these papers so others can see which are recommended, must reads, or exceptional. Descriptions are also provided on why a paper is important.

The technology is now in place for a revolution that would emphasize principles in various fields. While the primary barriers are those relating to disincentives and the lack of incentives, I am optimistic that these will change.

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