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Sustainable Aquaculture for a Secure Future

Title: Econometric Assessment of Research Programs: A Bayesian Approach

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Abstract: Effective research-project assessment typically is impeded by project variety. In particular, bibliometric approaches to science assessment tend to offer little information about the content of the projects examined. We introduce here a new approach – based on Bayesian theory – of econometrically evaluating the factors affecting scientific discovery, and use the method to assess a biological research program comprised of numerous heterogeneous projects. Our knowledge metric not only flexibly accommodates project variety but accounts for information in "failed" as well as "successful" studies. Using a mean-absolute-deviation utility functional form to measure new scientific knowledge, we decompose knowledge gain into a mean-surprise and statistical-accuracy effect. The two effects are econometrically examined independently, and then combined into the net knowledge production function. Research FTE and distance to study site have statistically significant but moderate effects on the amount by which research shifts the prediction of scientific outcome. However, scientist education powerfully improves the research study's predictive accuracy or precision, a one-percent boost in the average investigator's formal schooling improving precision by 4.3 percent. Largely on the basis of that precision effect, increasing returns to research project scale are evident.

This abstract was excerpted from the original paper, which was prepared for the *Agricultural and Applied Economics Association's 2012 Annual Meeting*, Seattle, Washington, August

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