Ralph's Mind Projection Fallacy[1]

by

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Accounting thought, instruction, practice and regulation stress, to no surprise, the methods and importance of accounting. This leads, arguably, to excessive focus on accounting per se, as opposed to accounting in its natural (or real) environment. Our little exercise is designed to increase the discomfort of those who focus on accounting absent the tangled web of its natural environment.

Of course, no such exercise is for everyone. Ask yourself whether you think accounting is a source of information. If you think not, do not continue reading. But if you do, next ask yourself whether you think those who use accounting information rely exclusively on accounting information. If you think this is a reasonable description of reality, do not continue reading. But if you do think multiple sources of information are routinely a part of the natural environment, next ask yourself whether you think accounting information is used for a variety of purposes. If you think not, if you think it is all about some specific use such as valuing the entity, do not continue reading. But if you think the natural environment of accounting routinely finds any given entity's accounting information useful across a variety of purposes, we invite you to read on.

Those who have discarded our invitation are self-inflicted victims of the "mind projection fallacy," of ascribing to reality their own interpretation of reality.

The Exercise

To keep what follows as transparent as possible, we focus on a pair of decisions and a pair of information sources. Each decision requires we provide a point estimate of some variable or measure that will eventually be observed. Predicting the unemployment rate, our sales, our cost per unit or the temperature at some future location and time are illustrative.

Again to keep things simple, each point estimate and subsequent observation will be a real number; and we will use a (convenient) probabilistic description of our current knowledge of each of these variables or measures. Let x_1 denote the eventual value of the first variable or measure and $\hat{x}_1$ our point estimate thereof. Our error, $x_1 - \hat{x}_1$ is a random variable and our goal in selecting our point estimate is to minimize the variance of this error random variable, based on our state of knowledge at the time of selecting the estimate: $E(x_1 - \hat{x}_1)^2$, where the expectation is conditional on (our state of knowledge and) whatever we have learned from information sources that will be introduced shortly.

A parallel setup and notational device describes the second point estimate exercise.

[1] Jaynes [2003] stresses the distinction between reality and our knowledge of reality, and labels the failure to maintain this distinction the "mind projection fallacy."

Now for our state of knowledge. Our knowledge of the first variable or measure is given by

$$x_1 = \mu_1 + k\varepsilon_1 + \varepsilon_2$$

while that for the second is given by

$$x_2 = \mu_2 + \varepsilon_1 + \varepsilon_2$$

where μ_1, μ_2 and k are known constants and ε_1 and ε_2 are zero mean normal random variables with respective variances σ_1^2 and σ_2^2. In addition, the first information source will report ε_1 at cost c_1, and the second will report ε_2 at cost c_2.

Collecting these details, the goal is to decide which costly information sources to acquire and, subsequently, which pair of point estimates to offer, so as to minimize the sum of the prediction or estimation error costs and the information costs. To illustrate, if both information sources are acquired, perfect prediction is possible and we have a total cost of $c_1 + c_2$. Conversely, if no information is acquired, it is routine to verify the optimal predictions are μ_1 and μ_2, resulting in a total cost of $k^2\sigma_1^2 + \sigma_2^2 + \sigma_1^2 + \sigma_2^2$ provided our state of knowledge regards ε_1 and ε_2 as independent random variables.

Now for the rub. Taking a cue from the way we think about and offer instruction in accounting (not to mention regulate and practice), is it possible to focus on only the first decision and the first information source and make the correct choice concerning that information source?

Case 1 is affirmative. Suppose constant k is arbitrarily large and our state of knowledge regards ε_1 and ε_2 as independent random variables. This implies we will surely acquire the first information source, and we are not led astray by ignoring the second source or the second decision.

Case 2 is mildly disconcerting. Suppose constant $k = 1$ and our state of knowledge again regards ε_1 and ε_2 as independent random variables. Further suppose the first information source is prohibitively costly if available for only the first decision: $\sigma_1^2 < c_1 < \sigma_1^2 + \sigma_1^2$. Here, ignoring the information's multiple uses leads us to "under-value" its importance and make the incorrect choice.

Case 3 is equally disconcerting. Suppose constant k is rather small, the first information source is less costly, $c_1 < \sigma_2^2 < c_2$, and our state of knowledge regards ε_1 and ε_2 as nearly perfectly correlated random variables. Focusing only on the first choice and first source, the information is of trivial use, but expanding our horizon to include both sources we see the two sources are close to perfect substitutes and correctly select the first source.

Case 4 replicates Case 3, except the cost of the first information source is justified only when it is used in both decisions. We must, in this case, look at both sources and both decisions to identify the proper treatment of the first information source.

The following tables summarize our little exercise. Unless one wants to rely on luck or fortuitous circumstance, the proper approach is to consider both sources and both decisions.

Case 1: k large, independent shocks

	Expected cost
No info	$k^2\sigma_1^2 + \sigma_2^2 + \sigma_1^2 + \sigma_2^2$
Source 1	$\sigma_2^2 + \sigma_2^2 + c_1$
Source 2	$k^2\sigma_1^2 + \sigma_1^2 + c_2$
Both	$c_1 + c_2$

Myopic: decision 1, source 1

	Expected cost
No info	$k^2\sigma_1^2 + \sigma_2^2$
Source 1	$c_1 + \sigma_2^2$

In the large source 1 is beneficial if, and only if, $c_1 < k^2\sigma_1^2 + \sigma_1^2$.
In the small source 1 is beneficial if, and only if, $c_1 < k^2\sigma_1^2$.

Case 2: k = 1, independent shocks

	Expected cost
No info	$\sigma_1^2 + \sigma_2^2 + \sigma_1^2 + \sigma_2^2$
Source 1	$\sigma_2^2 + \sigma_2^2 + c_1$
Source 2	$\sigma_1^2 + \sigma_1^2 + c_2$
both	$c_1 + c_2$

Myopic: decision 1, source 1

	Expected cost
No info	$\sigma_1^2 + \sigma_2^2$
Source 1	$c_1 + \sigma_2^2$

In the large source 1 is beneficial if, and only if, $c_1 < \sigma_1^2 + \sigma_1^2$.
In the small source 1 is beneficial if, and only if, $c_1 < \sigma_1^2$

Cases 3 and 4: k = 0 and perfectly correlated shocks

	Expected cost
No info	$\sigma_2^2 + \sigma_1^2 + \sigma_2^2 + 2\sigma_1\sigma_2$
Source 1	c_1
Source 2	c_2
both	$c_1 + c_2$

Myopic: decision 1, source 1

	Expected cost
No info	σ_2^2
Source 1	c_1

In the large source 1 is beneficial if, and only if, $c_1 < \sigma_2^2 + \sigma_1^2 + \sigma_2^2 + 2\sigma_1\sigma_2$ and $c_1 < c_2$.
In the small source 1 is beneficial if, and only if, $c_1 < \sigma_2^2$.

The Larger Picture

Naturally we could expand the exercise to showcase numerous details, numerous subtle interactions and what have you. But the point is to ask yourself what this little exercise has to do with the way we think about, offer instruction in, practice and regulate accounting. If you think the answer is very little, you, too, have infected your world view of accounting with the mind projection fallacy. The reality of accounting is simply not divorced from the reality of its environment.

Jaynes, E. T., *Probability Theory: The Logic of Science* (Cambridge University Press, 2003).