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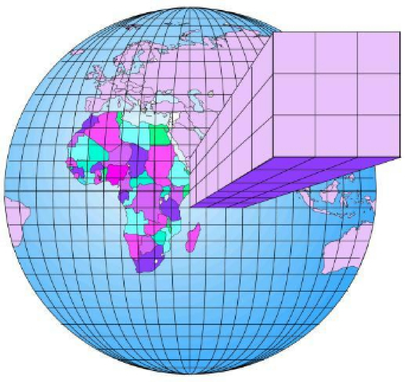
Mathiness and models: the new astrology?



There is an outstanding article in **aeon** on the use (and abuse) of mathematics and mathematical models in economy. It makes for a fascinationg reading, as many things said could directly apply the model-driven climatology. As a physicist, I love mathematics and find them invaluable in giving a precise meaning to what often are fuzzy statements. But this article includes some gems that make one reconsider any naive and exaggerated believe in mathematical models.

The economist Paul Romer is cited: *"Mathematics, he acknowledges, can help economists to clarify their thinking and reasoning. But the ubiquity of mathematical theory in economics also has serious downsides: it creates a high barrier to entry for those who want to participate in the professional dialogue, and makes checking someone's work excessively laborious. Worst of all, it imbues economic theory with unearned empirical authority."* Replace the word "economics" with "climatology" and you begin to understand.

You find many citations by the great physicist Freeman Dyson on climate issues, like this one *" …climate models projecting dire consequences in the coming centuries are unreliable"* or *"[Models] are full of fudge factors that are fitted to the existing climate, so the models more or less agree with the observed data. But there is no reason to believe that the same fudge factors would give the right behaviour in a world with different chemistry, for example in a world with increased CO2 in the atmosphere"* (**link**).

Ari Laor from the Technion (Haifa, Israel) writes in a **comment** at the American Scientist blog: *"Megasimulations are extremely powerful for advancing scientific understanding, but should be used only at a level where clear predictions can be made.* ***Incorporating finer details in a simulation with a large set of free parameters may be a waste of time, both for the researcher and for the readers of the resulting papers****. Moreover, such simulations may create the wrong impression that some problems are essentially fully solved, when in fact they are not. The inevitable subgrid physics makes the use of free parameters unavoidable…"*

The Bulletin of Atomic Scientists also has a very interesting article "**The uncertainty in climate modeling**". Here some gems: *"Model agreements (or spreads) are therefore not equivalent to probability statements…does this mean that the average of all the model projections into the future is in fact the best projection? And does the variability in the model projections truly measure the uncertainty? These are unanswerable questions."*

How true…

PS: The Bulletin has a series of 8 short contributions to this subject, and I suggest to take the time to read them all.

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