English Translation of the interview of Andrea Saltelli run by YT (Yutong) Chen, science journalist for Chinese Academy of Social Sciences(CASS) for the international news section of the academic newspaper named Chinese Social Sciences Today (CSST Chinese Edition).

October 23, 2022, Published December 5,
http://sscp.cssn.cn/xkpd/xszx/gj/202212/t20221202_5568048.html

The interview was in relation to (Puy et al. 2022).

(1) To those who may not have enough preliminary knowledge in math or statistics, could you please explain a bit more of the connection among model complexity, uncertainty and model effectiveness in an accessible way?

When is a model effective? In the context of the present discussion of models for policy, we can choose to say that a model is effective if it helps society understand, e.g. a challenge, and possibly choose courses of action to face said challenge. A model may warn about the effect of an impending epidemics and its consequences; a model can make the case that a certain resource is bound to run up in a foreseeable future, or to explore the goods and the bads of the introduction of a new technology.

It may happen that a model is indeed very large and complex, and that because society and its political representative trust the modellers, decision are taken based on the model although few people – aside from the developers themselves – understand how the conclusion was reached, what the uncertainties were, and what alternative conclusions could also have been plausibly reached.

This status of affair is not ideal. Model size and complexity are taken to guarantee of accuracy (the model predicts the true) and precision (the model error is small). Modellers may simply be wrong. Specifically, they may be wrong because they made their model too big and too complex, so complex in fact that its prediction have become very uncertain – though this effect is normally hidden from the observers. Here mathematics and human ambition combine to create a dangerous combination: modeller aspire to ever more detailed (bigger) models, but these constructions require making choices that come with their own uncertainties. Eventually the uncertainty builds up so that the big, apparently objective, accurate and precise model, end up being extremely uncertain in terms of its prediction.

(2) Can we say the paper also remind us that maybe we should be more cautious in scientific research and knowledge production in general? May we know what's your view on this matter?

Yes, both the producers (scientists) and consumers (citizens and their representatives) need more circumspection – respect for science and its achievements does not imply a blank check to whatever science produces. Critical scrutiny and a plurality of voices (including from within science, but also from the public affected by the policies suggested by the model as 'best') need to be heard.

(3) Anything else you want to bring up?
No.

Puy, Arnald, Pierfrancesco Beneventano, Simon A. Levin, Samuele Lo Piano, Tommaso Portaluri, and Andrea Saltelli. 2022. "Models with Higher Effective Dimensions Tend to Produce More Uncertain Estimates." *Science Advances* 8 (eabn9450).