

# Critical concerns, quality control and issue monitoring

Andrea Saltelli



BARCELONA  
SCHOOL OF  
MANAGEMENT

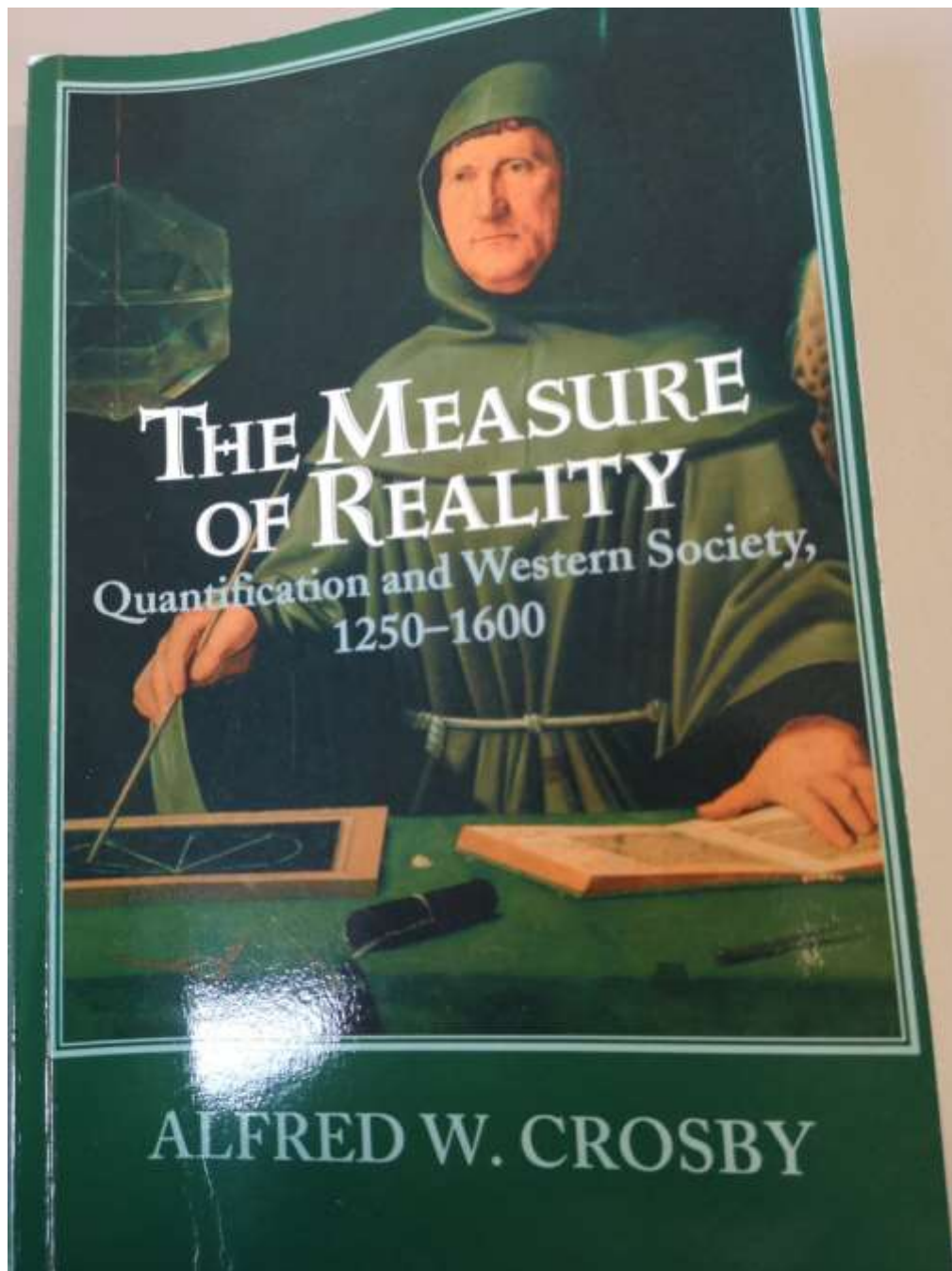
Destination Earth Meeting – Strategic  
Advisory Board, 30 June 2023

09:30 – 13:00

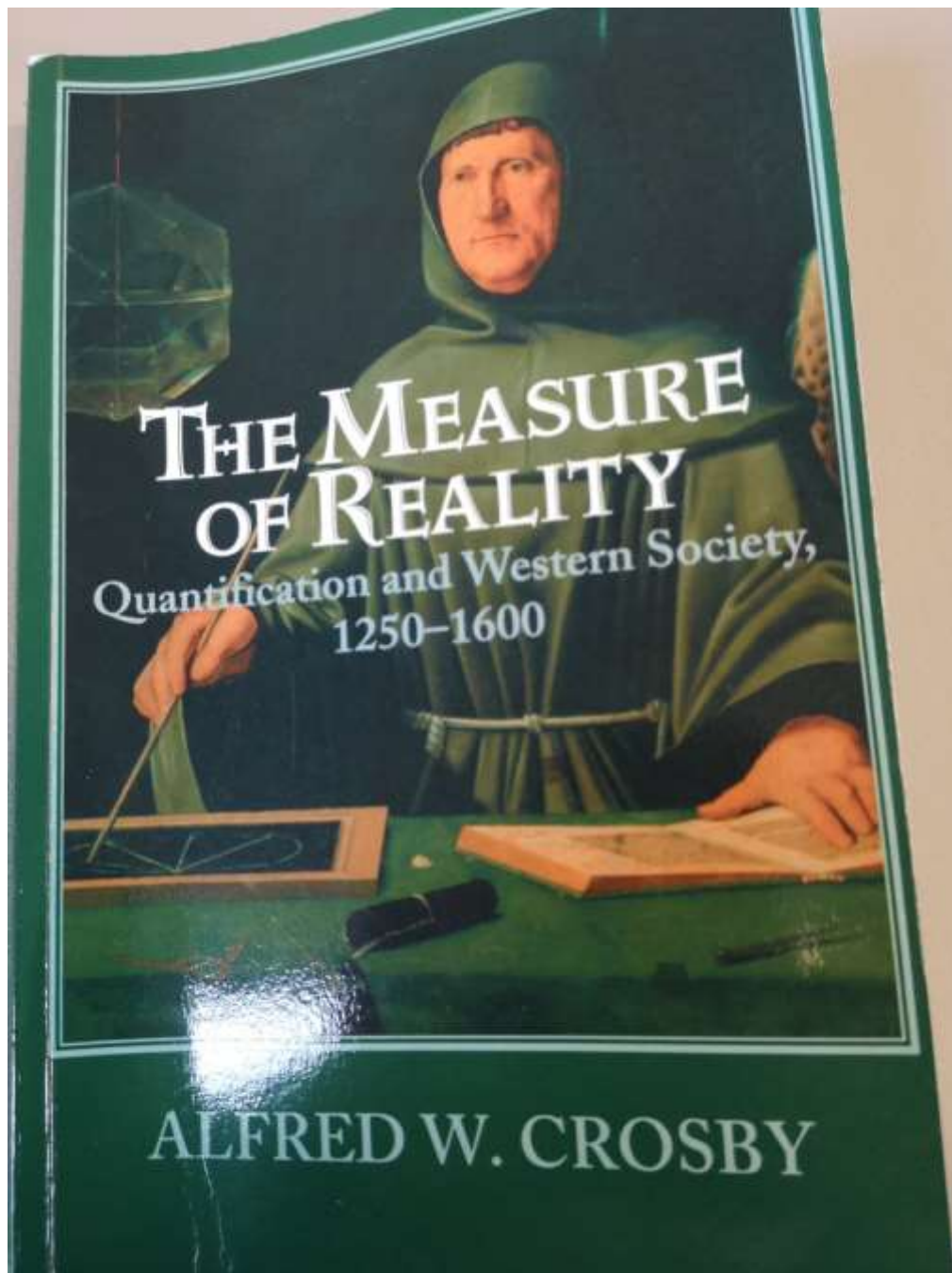
Centre Borschette Room 0.C. – Brussels



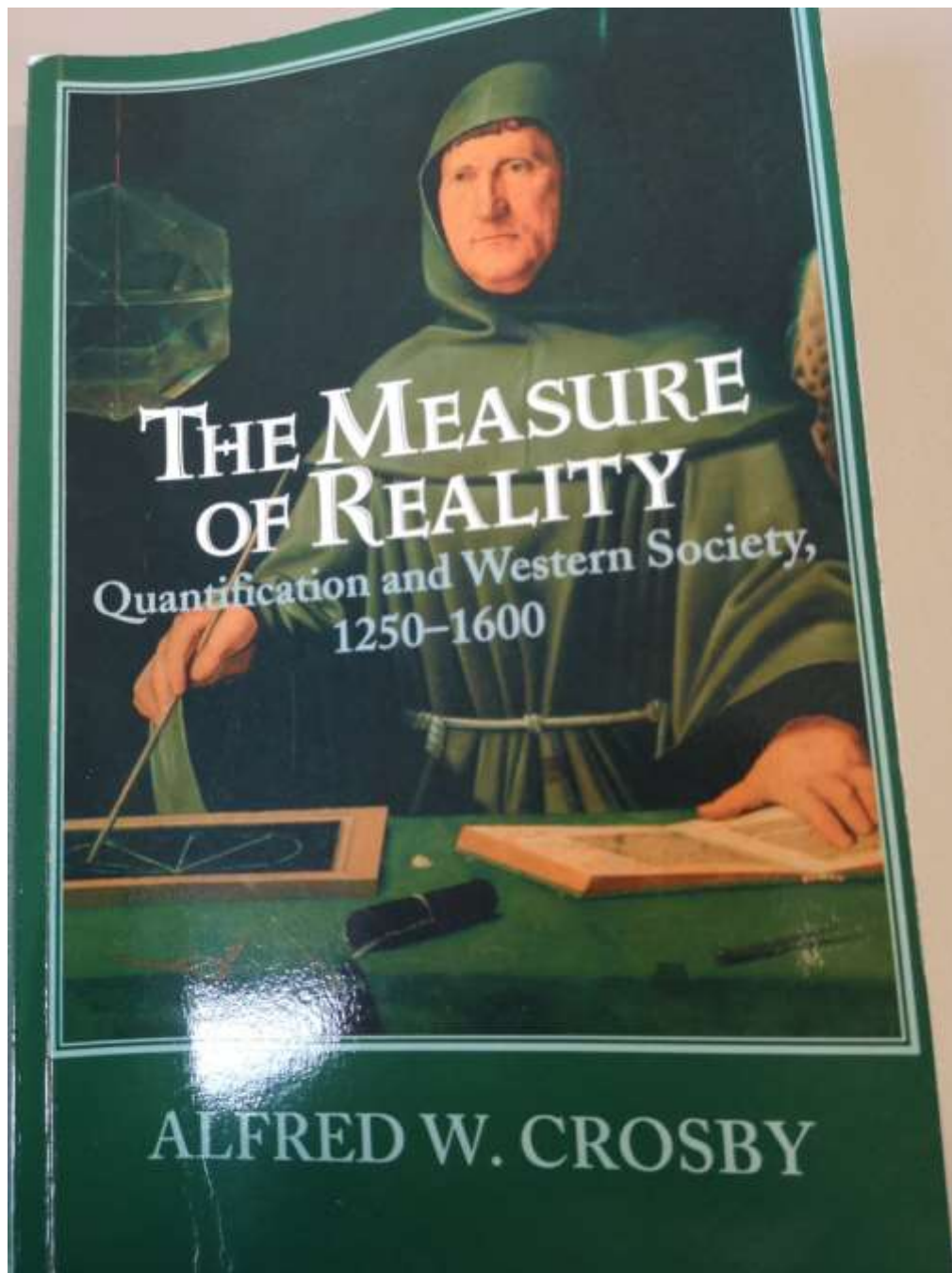
Is quantification important?  
Or all-important?



Were quantification and visualization the engine inside the engine of western success and domination?



Quantification and visualization of space and time gave rise in the XIV century to a true revolution, in music, painting, accounting, cartography, astronomy ...

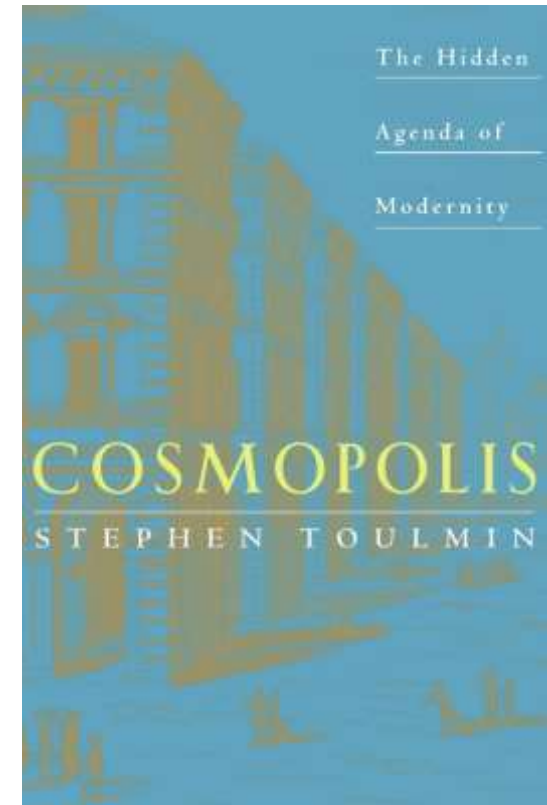
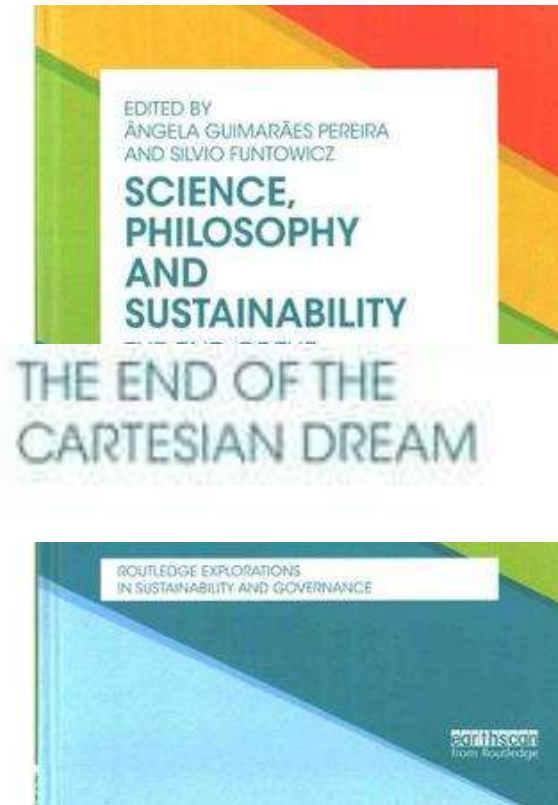
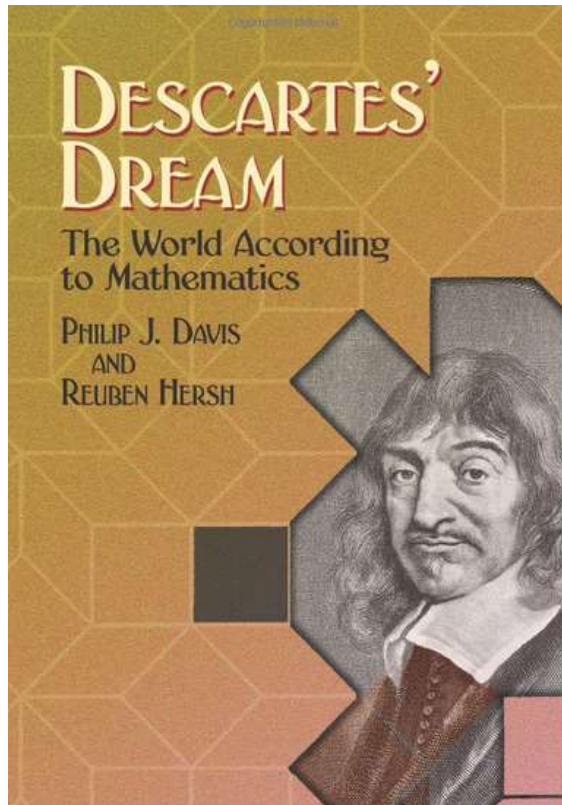


... a revolution that in the following two centuries XV-XVI ensured the epochal success of the West and its domination over the rest of the world

So how can DestinE's  
digital twins be possibly  
wrong?

DT's are wrong because

– are a wrong metaphor (the planet as a  
manufact; the ultimate Cartesian Dream)



DT's are wrong because

– wish to build general purpose machineries based on the belief that uses will be found for it; if it is true that “Financial markets and private companies, are in an “arms race” for climate intelligence” [1]. should this race be met with public funds?

[1] L. Harris, “Rise of the Climate Rating Agencies,” *The American Prospect*, Apr. 12, 2023. Accessed: Jun. 07, 2023. [Online]. Available: <https://prospect.org/api/content/6015e258-d87d-11ed-bd1d-12163087a831/>



# DT's

- assumes wrongly that climate change needs more evidence to promote political agency, and that said evidence can come in the form of DT's

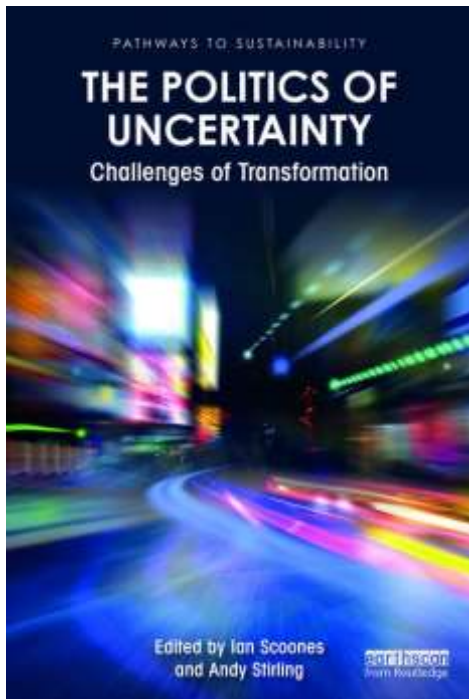
# DT's

-takes away resources to build a dubious future “the current development cycle of global models is already at least six years and it takes months to simulate the next century’s climate on supercomputer” while urgent work attends us in the present.

(For DG DIGIT: Cyber security; Twitter and other critical infrastructure; an open science that is not ‘captured’ by publishers, EU lag in large language models technology, ... Why don't we ask a sample of NGO from aid to migration to corporate responsibility to creatively plug in?)

# Problems with DestinE

The EC leans toward technology as a conduit to solve policy problems → vulnerable to projects oriented to technological solutions and technological optimism



## 4

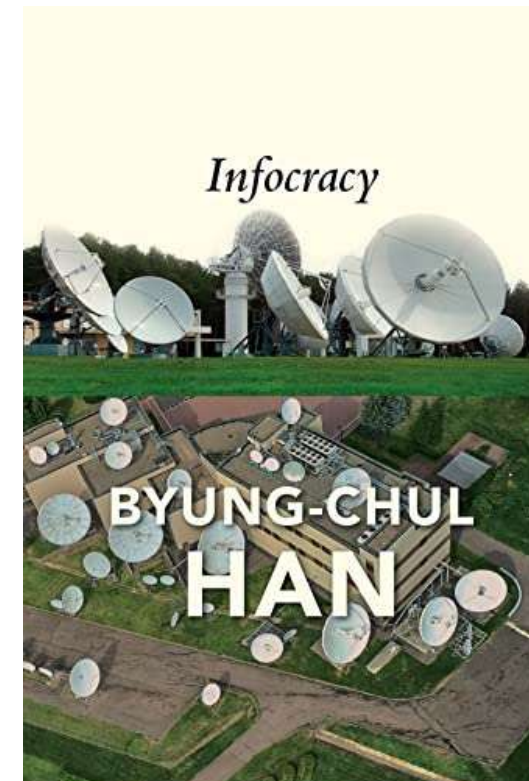
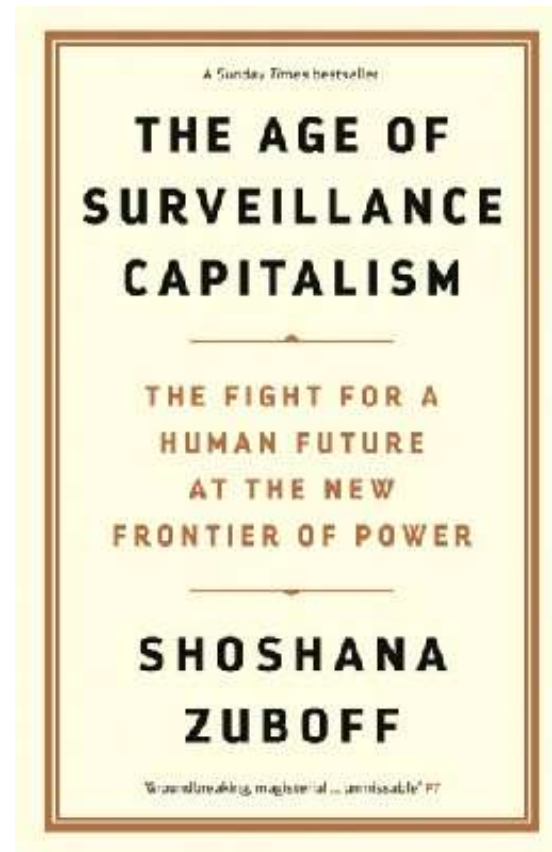
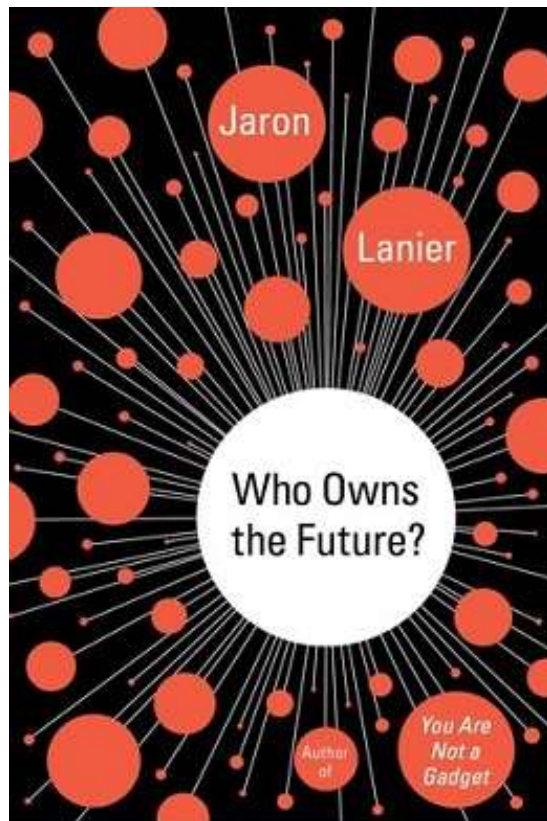
### THE UNRAVELLING OF TECHNOCRATIC ORTHODOXY?

Contemporary knowledge politics  
in technology regulation

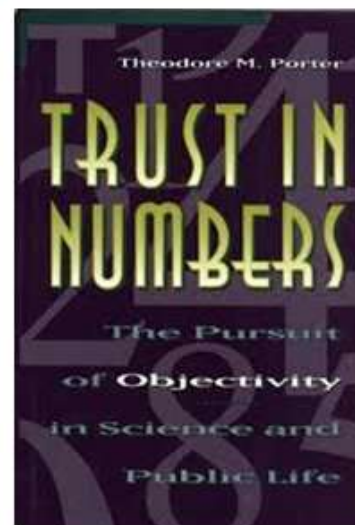
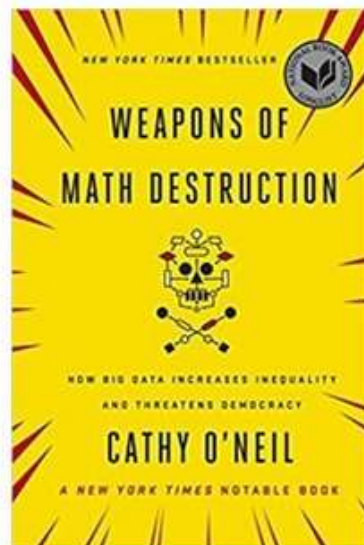
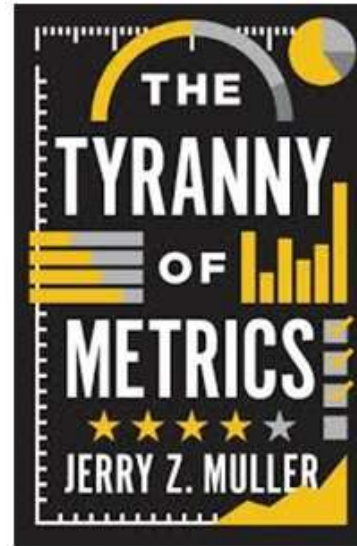
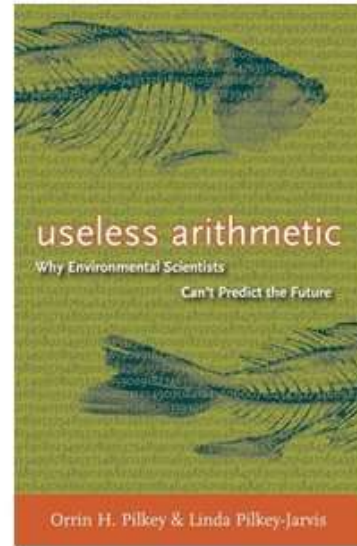
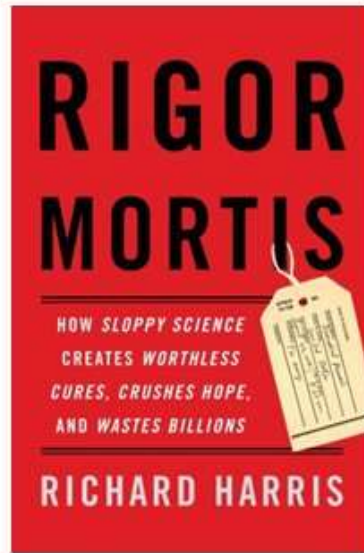
*Patrick van Zwanenberg*

# Problems with DestinE

The epistemic community around DestinE unexposed to the concerns about the digitalization of the real



# Algorithms, models, metrics, statistics...



… Our world is structured by numbers, visible and invisible, where truth is conveyed and reality constructed

Numbers are seductive, performative, confer to their masters' epistemic power and legitimacy

Governing the modern state, or even contesting it, without numbers is impossible

Numbers are the prevalent means to express value in our societies  
… Access & production of numbers reflect and reinforce power imbalances [2]

[2] Saltelli, A., Andreoni, A., Drechsler W., Ghosh, J., Kattel, R., Kvangraven, I. H., Rafols, I., Reinert, E. S., Stirling, A. and Xu, T. (2021). Why ethics of quantification is needed now. UCL Institute for Innovation and Public Purpose, Working Paper Series (IIPP WP 2021/05).

# Problems with DestinE

Calls on scarce resources; beware associated risks

Excessive faith in larger and larger models

COMMENT • 24 JUNE 2020

## Five ways to ensure that models serve society: a manifesto

Pandemic politics highlight how predictions need to be transparent and humble to invite insight, not blame.

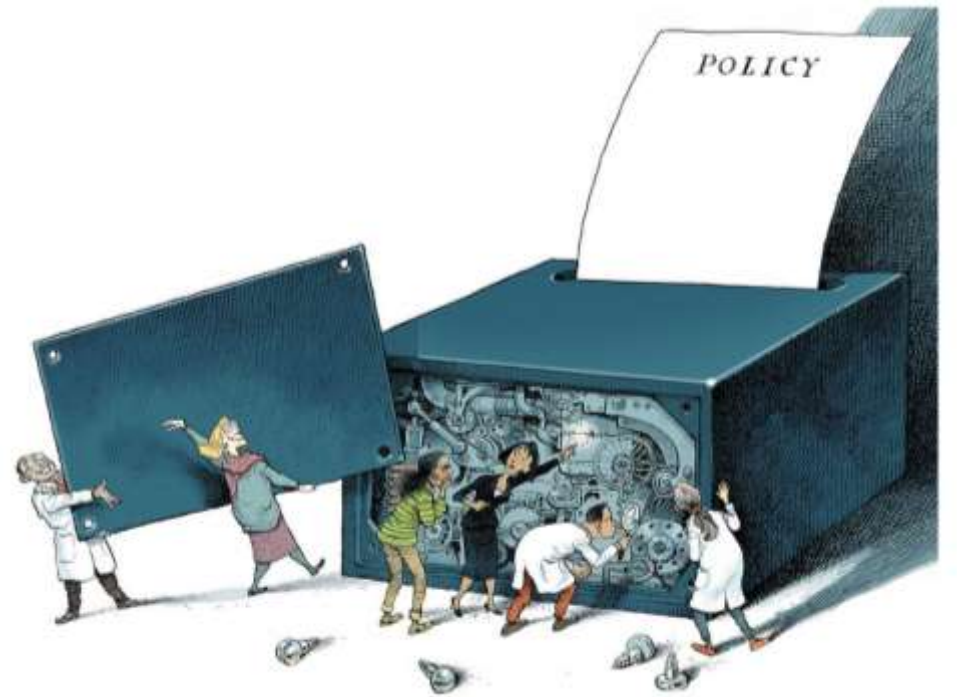


Illustration by David Parkins

# Mind the assumptions

Assess uncertainty and sensitivity

# Mind the hubris

Complexity can be the enemy of relevance

# Mind the framing

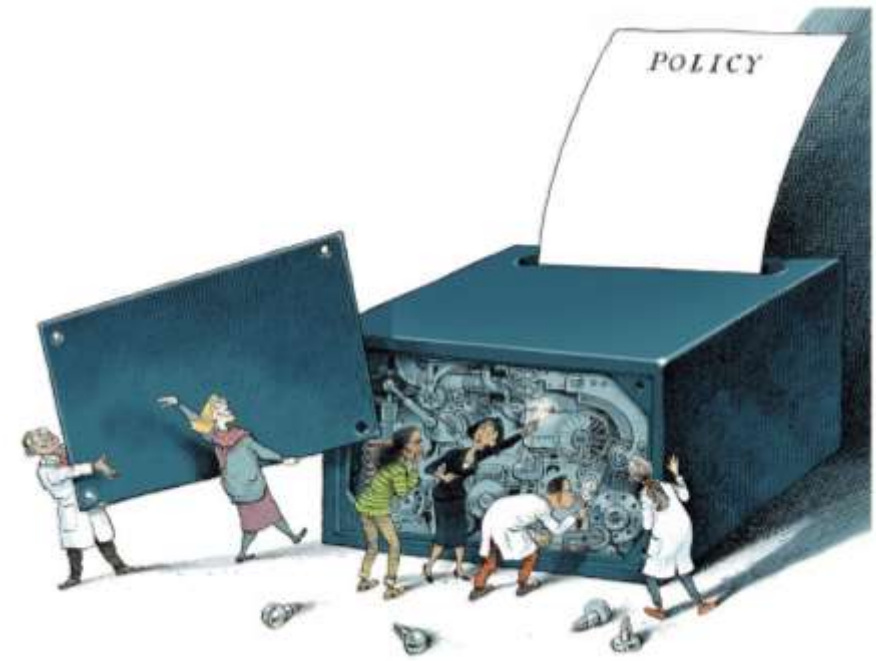
Match purpose and context

# Mind the consequences

Quantification can backfire.

# Mind the unknowns

Acknowledge ignorance

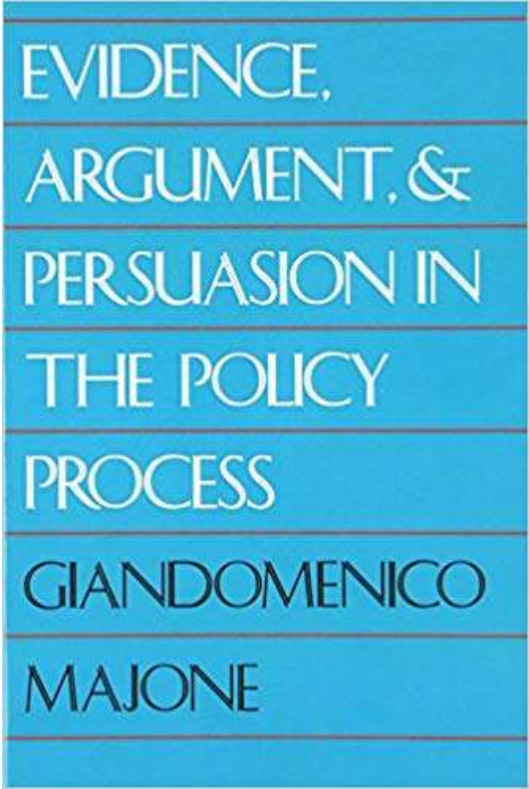




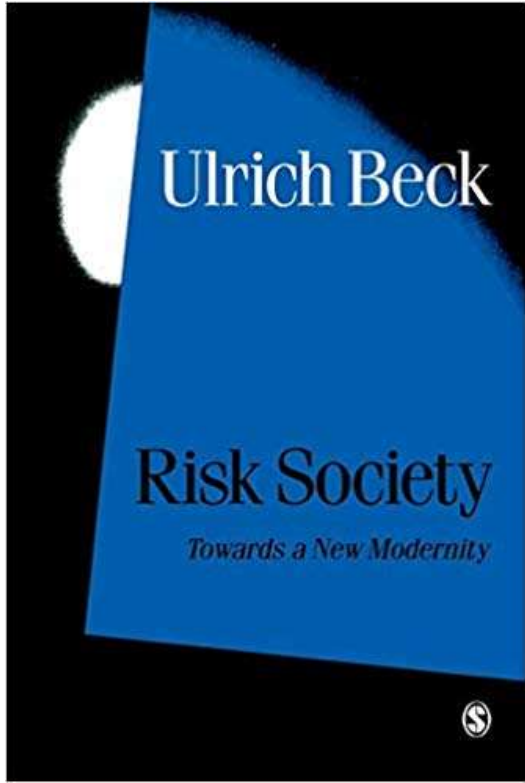
# From Ulrich Beck to Giandomenico Majone: the technique is never neutral



Ulrich Beck  
(1944 –2015)



1989



1992 (1986)



Environmental Science & Policy

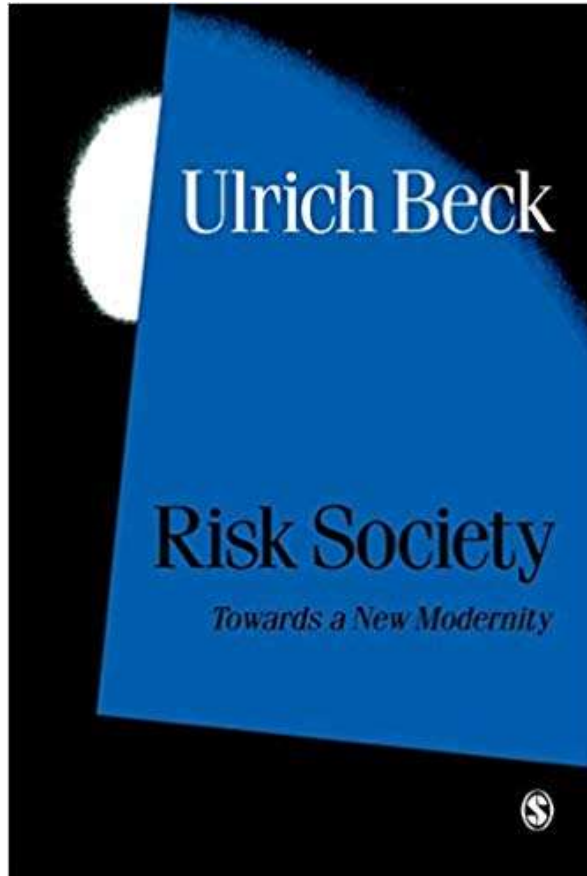
Volume 106, April 2020, Pages 87-98



The technique is never neutral. How methodological choices condition the generation of narratives for sustainability

Andrea Saltelli <sup>a, b</sup> ✉, Lorenzo Benini <sup>c</sup>, Silvio Funtowicz <sup>a</sup>, Mario Giampietro <sup>d, e</sup>, Matthias Kaiser <sup>a</sup>, Erik Reinert <sup>a, f</sup>, Jeroen P. van der Sluijs <sup>a, g, h</sup>

“It is not uncommon for political programs to be decided in advance simply by the choice of what expert representatives are included in the circle of advisers.”

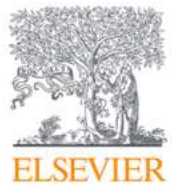


1992 (1986)



Ulrich Beck  
(1944 –2015)

‘expected utility’, ‘decision theory’, ‘life cycle assessment’, ‘ecosystem services’ ‘sound scientific decisions’ and ‘evidence-based policy’ … profusion of digits, promises of accuracy



## Research Policy

Available online 21 December 2022, 104709

In Press, Corrected Proof 



Discussion

Against misleading technocratic precision in research evaluation and wider policy – A response to Franzoni and Stephan (2023), ‘uncertainty and risk-taking in science’

Andy Stirling 



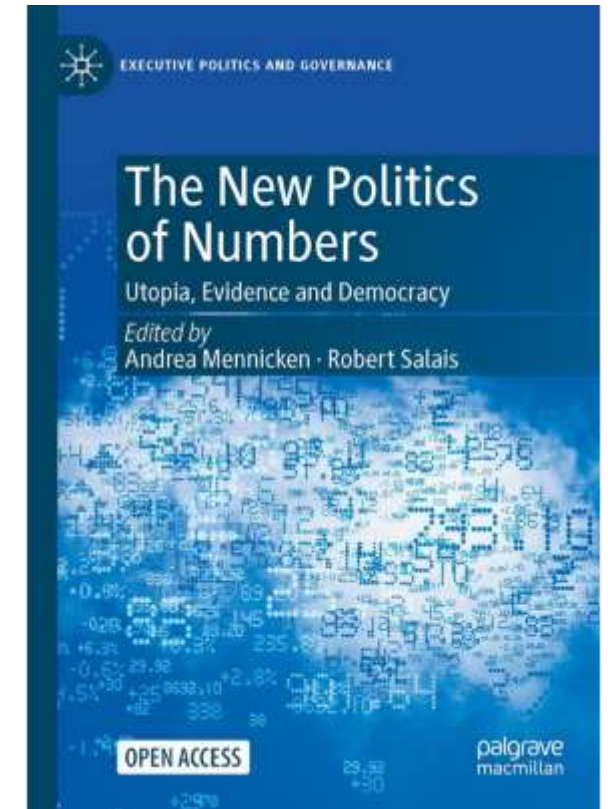
Andrew Stirling

Since the technique is never neutral a technical proof of quality is illusory without a parallel investigation of normative quality

Technical Quality

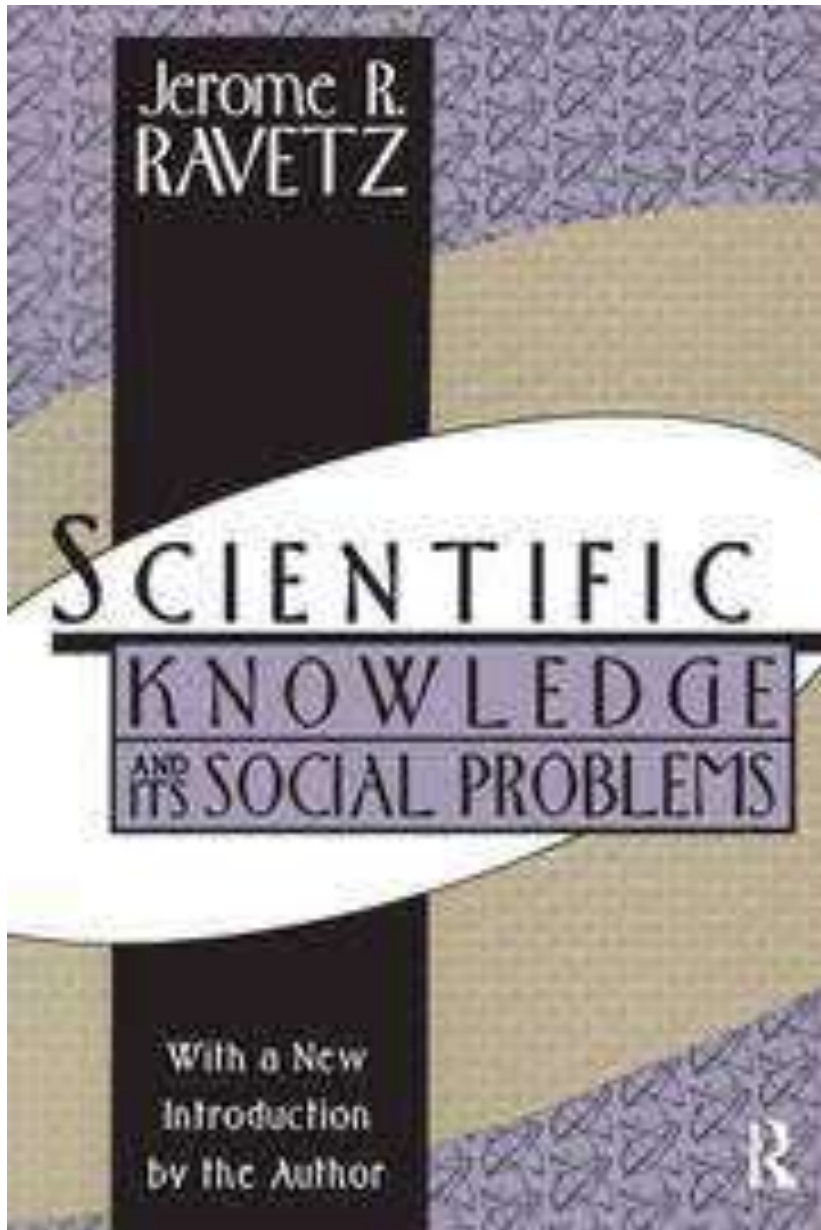
Normative quality

How the numbers of neoliberalism (New Public Management) constitute a regime of a-democracy; the example of indicators of employment

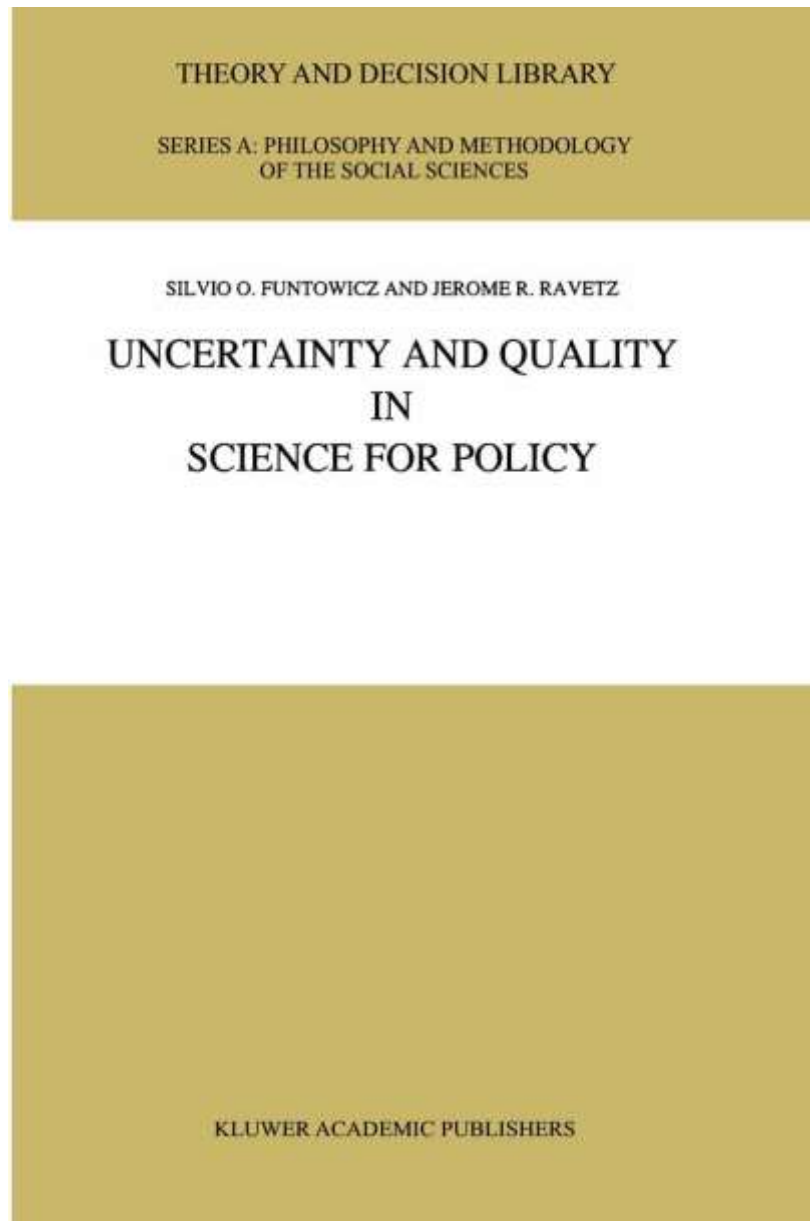


Salais, R. (2022). “La donnée n’est pas un donné”: Statistics, Quantification and Democratic Choice. In *The New Politics of Numbers: Utopia, Evidence and Democracy*, Andrea Mennicken and Robert Salais, Palgrave Macmillan, pp. 379–415.





1971



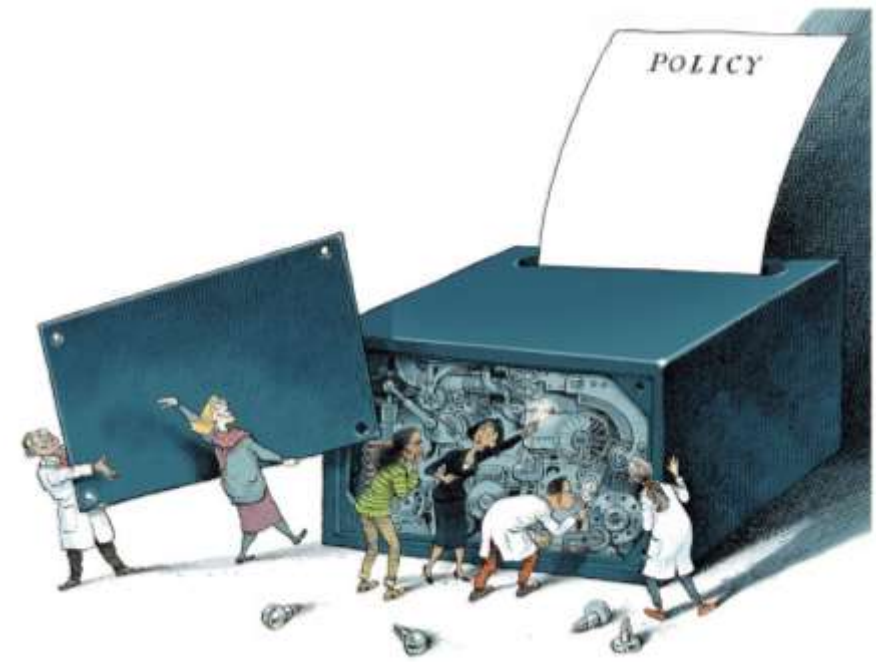
1990

Similar principles  
in founding texts  
of post-normal  
science [3]

[3] Funtowicz, Silvio, and Jerome R. Ravetz. 1993. 'Science for the Post-Normal Age'. *Futures* 25(7):739–55. doi: 10.1016/0016-3287(93)90022-L.

# Mind the consequences

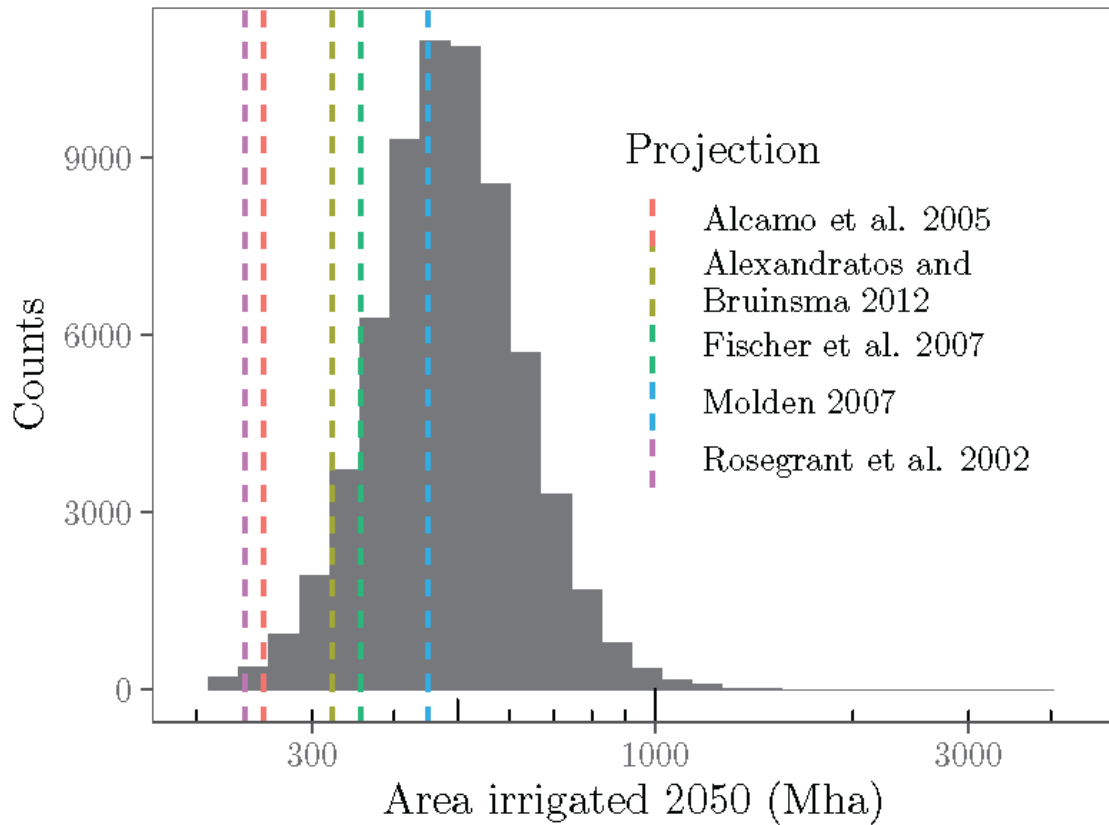
Quantification can backfire.



From the risk of financial products to irrigation to the models for disaster insurance bad modelling may lead to wrong decisions

## SUPPLEMENTARY INFORMATION

1. [Additional information and references](#) >260 references



## Current Models Underestimate Future Irrigated Areas

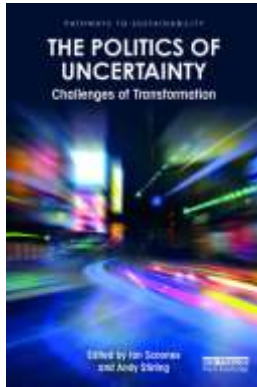
A. Puy, S. Lo Piano, A. Saltelli, 2020, Current models underestimate future irrigated areas, *Geophysical Research Letters*, Open access, Volume 47, Issue 8, doi.org/10.1029/2020GL087360.

# 3

## SHARING RISKS OR PROLIFERATING UNCERTAINTIES?

Insurance, disaster and development

*Leigh Johnson*



Model-based parametric insurance led to dramatic consequences for developing countries experiencing draughts

Open access: <https://www.taylorfrancis.com/books/politics-uncertain-ian-scoones-andy-stirling/e/10.4324/9781003023845>

# Problems with DestinE

The engagement of social science and humanities seems to be of a confirmatory nature – to help the actors of DestinE to get society onboard, [behavioural technologies]

(→ deficit model – the publics reject innovation because of scarce literacy)

## Further disorientation in the hall of mirrors

[Brian Wynne](#)  [View all authors and affiliations](#)

[Volume 23, Issue 1](#) | <https://doi.org/10.1177/0963662513505397>

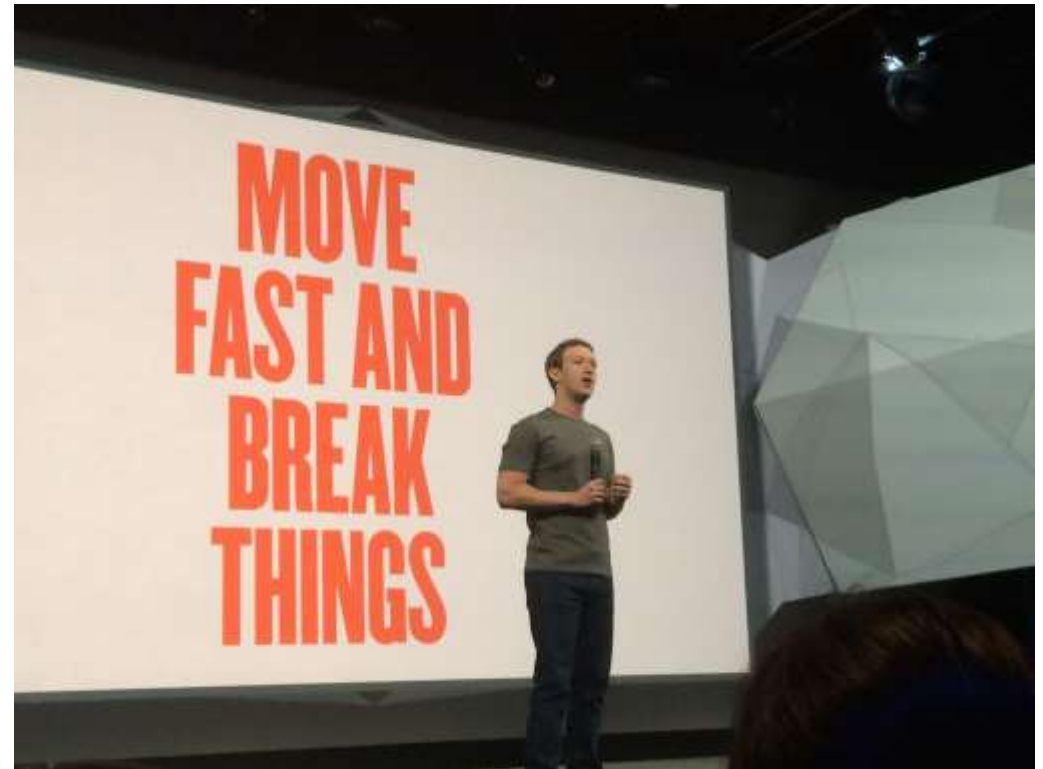
**Sage Journals**

Browse by discipline  Information for

Public Understanding of Science



Problems with DestinE: A-la-Zuckerberg approach to introducing new technologies: first it is done, then one worries about “How to embed the ethical, legal, and social considerations in the Digital Twin of the Earth and its interface (e.g. privacy, equity, accessibility ... )?”



# Don't forget 2013 EC's Human Brain Project

“the European Commission awarded ... a staggering 1 billion euro grant ... the people I contacted struggled to name a major contribution that the HBP has made in the past decade” (Yong, 2019)

**nature**

[Explore content](#) ▾ [About the journal](#) ▾ [Publish with us](#) ▾

[nature](#) > [comment](#) > article

Published: 03 September 2014

## Neuroscience: Where is the brain in the Human Brain Project?

[Yves Frégnac](#) ✉ & [Gilles Laurent](#) ✉

[Nature](#) 513, 27–29 (2014) | [Cite this article](#)

Newsletters

*The Atlantic*

SCIENCE

## The Human Brain Project Hasn't Lived Up to Its Promise

Ten years ago, a neuroscientist said that within a decade he could simulate a human brain. Spoiler: It didn't happen.

By Ed Yong    JULY 22, 2019

A critical function in DestinE workplan?

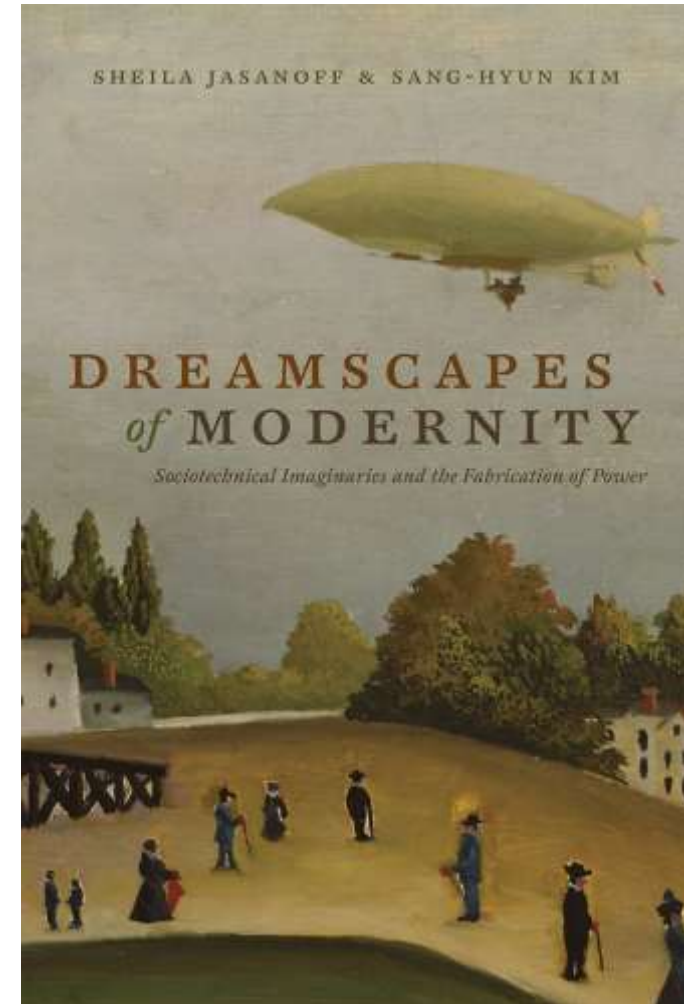
**Title:** Critical concerns, quality control and issue monitoring

A built-in element of reflexivity and critique; an anticipatory function; an observatory of quantification (and of DestinE itself) to identify:

- Winners and losers, voices to be heard from disciplines and societal actors
- Sociotechnical imaginaries and associated vulnerabilities



Sheila Jasanoff



# A built-in element of reflexivity and critique...

- Alternatives framings, styles and methods (lenses: system ecology, non-Ricardian economics, feminist economics, post-normal science...)













Environmental Science & Policy

Volume 142, April 2023, Pages 99-111



## Impact assessment culture in the European Union. Time for something new?

Andrea Saltelli<sup>a b</sup>  , Marta Kuc-Czarnecka<sup>c</sup> , Samuele Lo Piano<sup>d</sup> ,  
Máté János Lőrincz<sup>d</sup> , Magdalena Olczyk<sup>c</sup> , Arnald Puy<sup>e</sup> ,  
Erik Reinert<sup>f g</sup> , Stefán Thor Smith<sup>d</sup> , Jeroen P. van der Sluijs<sup>b h</sup> 

nature reviews earth & environment

Explore content ▾

About the journal ▾

Publish with us ▾

Subscribe

[nature](#) > [nature reviews earth & environment](#) > [comment](#) > [article](#)

Comment | [Published: 29 June 2023](#)

## Irrigation modelling needs better epistemology

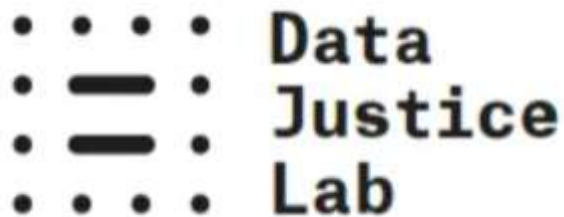
[Arnald Puy](#) , [Michela Massimi](#), [Bruce Lankford](#) & [Andrea Saltelli](#)

[Nature Reviews Earth & Environment](#) (2023) | [Cite this article](#)

# A built-in element of reflexivity and critique...

- Implications of ‘governing by numbers’, including for democratic agency, democratic deliberation and power differentials
- Exploding extant and hidden uncertainties
- Appealing to societal creativity for new cases and epistemologies

# Existing initiatives looking at quantification



## Radical Statistics Group

Using statistics to support progressive social change



THE ALGORITHMIC JUSTICE LEAGUE

# More references at [www.andreasaltelli.eu](http://www.andreasaltelli.eu)



## Coming Out Soon: The politics of modelling



### Praise for the volume

*"A long awaited examination of the role —and obligation —of modeling."*

**Nassim Nicholas Taleb**, Distinguished Professor of Risk Engineering, NYU Tandon School of Engineering. Author, of the 5 -volume series *Incerto*.

\*\*\*

*"A breath of fresh air and a much needed*

### Mastodon Toots by

@AndreaSaltelli



AndreaSaltelli

2023/4/18 17:24

"Kaufman, who was until recently a senior climate economist in the White House, questioned the need for the government to set a single price. Regulators should stop "pretending we