IS ECONOMICS QUEEN OF THE SOCIAL SCIENCES?

Nancy Cartwright

Philosophy, Politics and Economics Lecture

Oxford, November 2025

‘What makes economics great, and quite frankly what makes us the highest-paid of the social sciences, is that we can, with *very few pretty basic assumptions*, explain a wide variety of phenomena in the real world.’

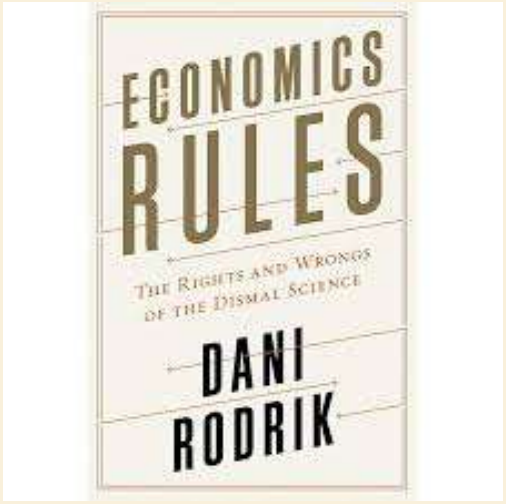
Transcribed from Jonathan Gruber’s ug Microeconomics course at MIT

What’s her claim to this exalted position?

Economics is exact

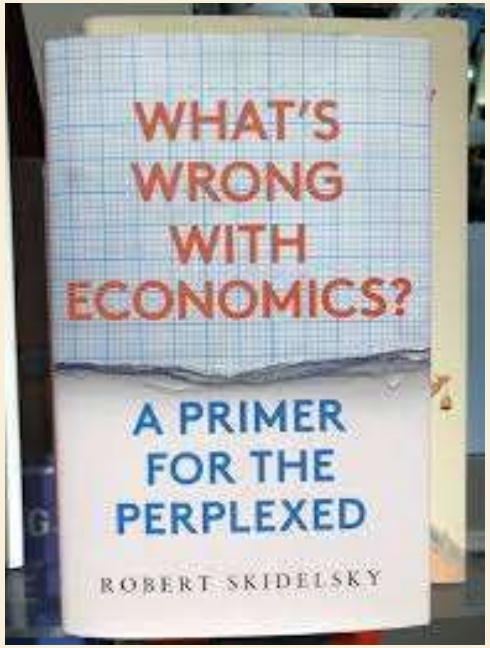
Sociologist Marion Fourcade et al, *Superiority of Economists* quoting '**an eminent economics professor**'

You are only supposed to follow certain rules. If you don't…, you are not an economist. So that means you should derive the way people behave from strict maximisation theory… The opposite would be arguing by example. You're not allowed to do that … People say 'that's anecdotal.' That's the end of you if people have said you're anecdotal.



Economics as exact

‘Once a model is stated in mathematical form, what it says or does is obvious to all who can read it. This clarity is of great value.’



Economics as exact

‘The conviction that underneath the messiness of appearances there exists an underlying order that can be captured by logic and mathematics.’

Working definition of ‘exact’

1. Claims are
   a. Precise
   b. Unambiguous
2. Arguments are rigorous
   a. Valid
   b. With warranted assumptions

Problems

The drive for exactness pushes economics

A. To study small worlds.

B. To treat real settings as small worlds.

But

Much of the real world is just not exact

Problems

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And anyway

Economics is not an exact science

Problems

The drive for exactness pushes economics

A. To study small worlds

My claim:

Economics can be an exact science in small worlds

And only in small worlds

How physics predicts precise results

- Physics establishes principles meant to be universal.
- When it uses these principles for precise prediction or precise control in the real world…
- The results are derived within models where

  Unsurprisingly
- All the relevant factors for the phenomenon of interest are ones physics knows how to treat precisely.
- Otherwise it cannot yield precise results!

  Waffle in → waffle out

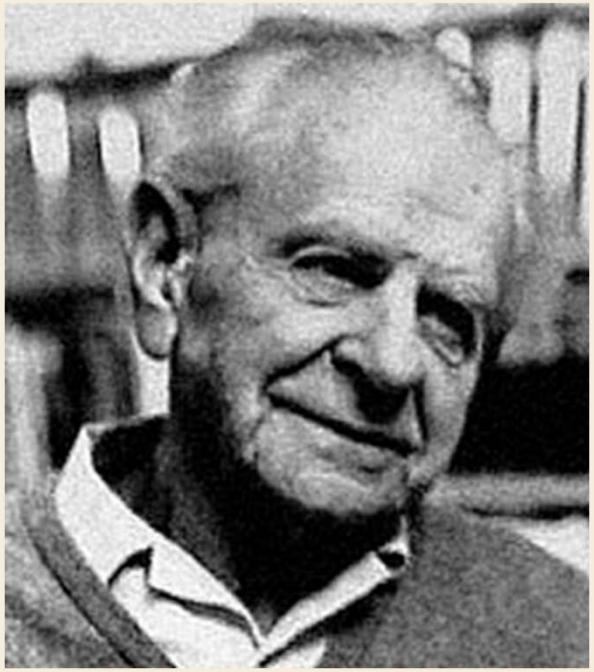
Physics' precise successes are in small worlds

- 'Small world' is relative to
  - A given phenomenon
  - A given body of knowledge
- A real setting S is a small world for a phenomenon X for a given body of knowledge K =
  1. All the factors in S that affect X are ones K knows how to treat
  2. K knows how to calculate what happens when these factors occur together.

Why can physics be exact when econ cannot?

Karl Popper

- Do only piecemeal social planning.
- Choose the problems for which your science knows how to provide solutions.
- As physics does.

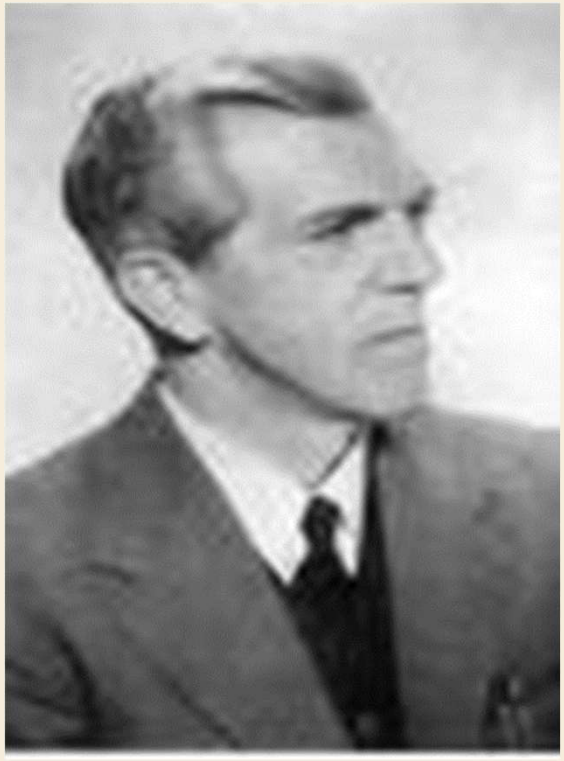


Max Weber

- The concepts, claims & arguments of exact sciences are hugely constrained.
- Physics picks its concepts & claims to meet these constraints.
- The social sciences aren't allowed to do this.
- They should study the concepts we care about.
- Those generally don't lend themselves to exact treatment.

Trygve Haavelmo

- No-one asks physics to predict the course of an avalanche.
- But economists are asked to predict the course of the (avalanche of the) economy.

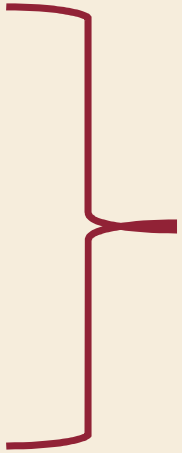


Gian Battisto Vico

- Those sciences should be most successful that study what we make.
- Me: as does physics
- With small exceptions.
- Like the planetary system.

Why can physics be exact when econ cannot?

- Popper
- Weber
- Haavelmo
- Vico



Physics treats (mostly) only small worlds

Economics should treat large worlds

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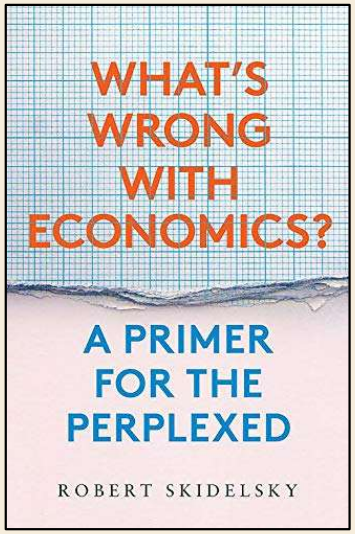
Economics is not an exact science

- ‘Physics has in nature its own ready-made laboratory, where events regularly repeat themselves. The social world lacks such stationary features. The standard economic model is typically a theoretical representation of a closed system.
- Economics … convert[s] open systems into closed systems by excluding ‘moves’ that would render the system unstable.
- Dictators ‘freeze the frame’ by order:
- Economists do it by ‘modeling’.’

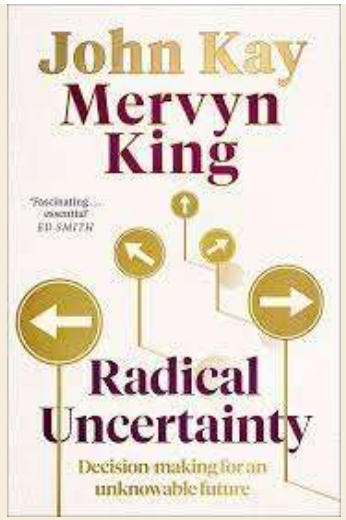
Lord Robert Skidelsky
Political economist,
Keynes biographer



Skidelsky cont.

- ‘Nobel Laureate Thomas Sargent (b.1943) defines a person as a “constrained, intertemporal, stochastic optimising problem”.
- Expectations about the future are simply probability distributions over a sequence of events. Uncertainty is reduced to probability, and can thus be labelled a special case of certainty.
- The neoclassical model of rationality … might make sense in a small, closed world with well-defined limits. The coin-toss experiment is supposed to replicate this—it is either a head or a tail—but it is irrelevant as a test of rationality in open systems admitting of many different outcomes.’

Sir John Kay: ‘one of Britain’s leading economists.’
Lord Mervyn King: ‘British economist and public servant;… Governor of the Bank of England from 2003 to 2013.’



- ‘Asked: ‘‘What insights do we gain from this model?”
- One author’s answer: ‘The numbers derived from the model should be the policy’.
- That answer begins to make sense only if the economist believed that his model described ‘the world as it really is’.’
- But a small world model does not do that.

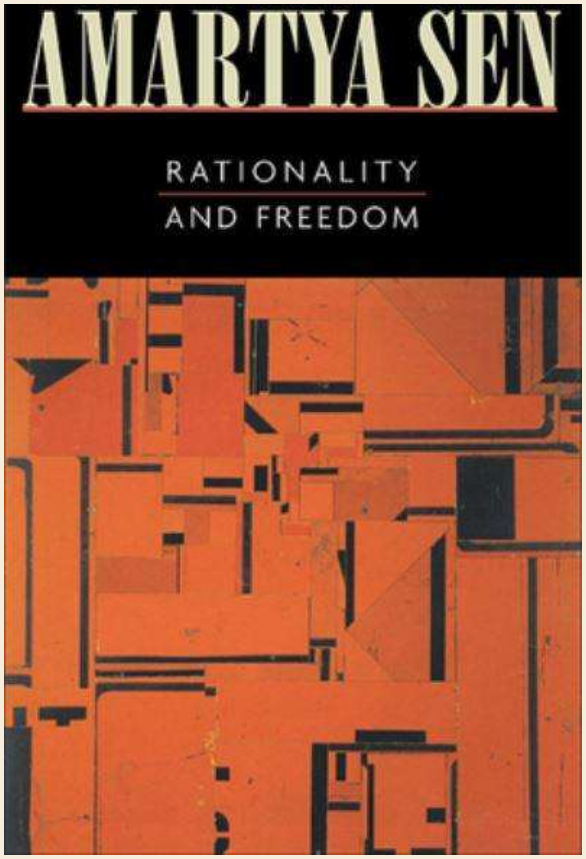
What's wrong with converting open systems into closed systems? 'Freezing the frame' by modeling?

Generally …

it just doesn't work

Significant relevant features studied in other fields can't be fitted into an econ frame

Consider Amartya Sen on Commitment



Sen claims ‘that there is an altruistic attitude toward others that does not make sense within the terms of rational choice theory’.

We often act from ‘“commitment” to others’.

Contrasted with egoism and sympathy.

‘It involves recognizing the goals of another and, regardless of whether… this answers to independent goals of one’s own – regardless of whether… one internalizes those goals in “sympathy” with the other – letting them impact on how one behaves.’

From Philip Pettit, Economics and Philosophy, 21 (2005) 15–32

Petit on Sen cont.

‘Where sympathy transforms the motor of self-interest, tuning it to the welfare of others, commitment puts another motor in its place.’

‘… [W]hile one’s sentiments push one in this or that direction, [in commitment] the recognition that others will suffer as a result of going in that direction causes one to alter trajectory. Without relying on the warm stirrings of fellow-feeling, the cold, clear light of reason leads one to change tack.’

Petit on Sen cont.

- ‘The cases Sen invokes in relation to commitment typically involve people’s registering the goals of others and, without any incorporation or integration of those goals within their own goal system.’
- ‘This altruistic attitude toward others does not make sense within the terms of rational choice theory.’

Philip Petit
Political Philosopher

Besides commitment …

- Many of the features that affect phenomena that econ studies don't have cardinal measures.
  - Often at best a partial ordering
- Many are structural, affecting, e.g
  - The choice architecture
  - What agents prefer
  - Whether a tendency studied in economics is present, or can operate and if so what it can contribute.
- Many are studied in fields that have an incommensurable way of picturing the world.

Of course you can cheat…

- To get a desired outcome from an econometric equation, put in an exogenous shock of just the right size.
  - Physics does this with forces all the time, and in both fields it is

    Ad hoc!
- Assign utilities arbitrarily in a way that gets the right answer

  Ad hoc!
- Gerrymander choice sets, preferences, probabilities so that actions observed are in accord with maximising expected utilities

  Ad hoc!
- Choosing weightings in measure and models that produce just the right outcomes

  Ad hoc!
- Etc.

Of course you can cheat…

- To get a desired outcome from an econometric equation, put in an exogenous shock of just the right size
  - Physics does this with forces all the time
  - And in both fi[illegible]
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- Choosing weightings in measure and models that produce just the right outcomes
  - Ad hoc!
- Etc.

These all amount to…

Giving up on exact science whilst preserving the pretence of it

SO…

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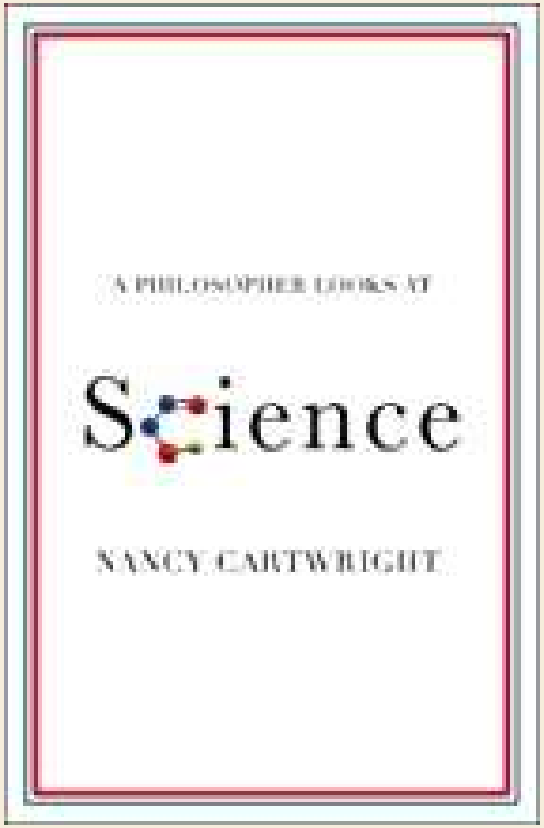
B. Pretending the large world is small

An example I've long worried about, raised recently in Kay and King:

Probability

- Much economic research makes use of probabilities.
- OK -- IF probabilities can be attached to the phenomena that economics deals with.
- But: Is the social world that orderly?
- When I look at many economic studies
  - *I see no grounds for this assumption*
  - *I sometimes see good evidence against it*
  - *I see places where it leads us astray, wrt both accumulating and using knowledge.*



- Probability is a superb tool.
- Like a 30 piece-set of first-class chromium screwdrivers.

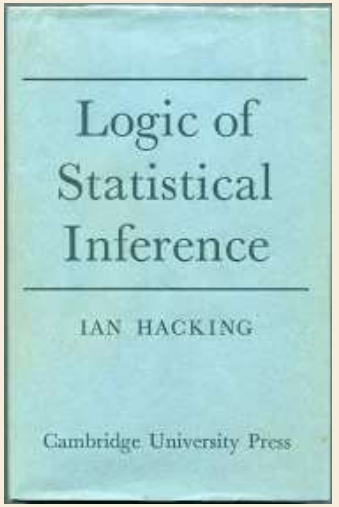
- Not all of our problems are loose screws.

Where do probabilities come from?

- Probabilities are generated by chance set-ups.
  - *Random draws from a pack of cards*
  - *'Fair' tosses of an unbiased coin*

Me: note the use already of probability language.

- They apply to settings that can be appropriately modelled as a chance set-up.
- Which much of the large world cannot.



1965

Cases where there’s an answer

- Given a pack of ten playing cards: four hearts, two diamonds, four spades. Draw one card at random. What’s the conditional probability that the card drawn is a diamond, given it is red?
- Do two ‘proper’ independent flips of a homogeneous coin. If the results are HH, draw one card at random from the 'pointed' cards in this pack (i.e., diamonds and spades), otherwise from the non-pointed cards. What’s the conditional probability that a drawn card is a diamond given it is red?

And where there’s not

- Give this pack to your neighbour to order on their aesthetic preferences; then pick the top card. What’s the conditional probability that a drawn card is a diamond given it is red?

You can insist that every data-generating process generates a probability.

But that just asserts the point, not defends it.

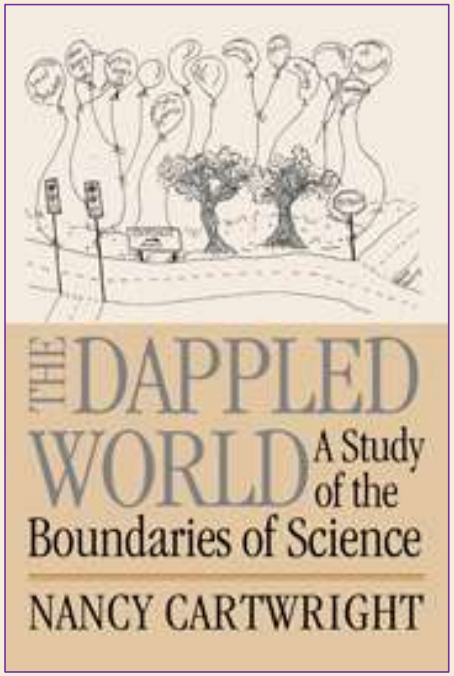
- Kay & King express the same worries

- Illustrating with a version of a television gameshow.
- My first work on this illustrates with an economics example.

- Sudhir Anand & Ravi Kanbur (1995) studying the case for direct government action to maintain food entitlements in Sri Lanka
- Their model is 'to explain some measure of living standard, H_{it}, for country *i* at time *t':*

$$H_{it} = \alpha_t + \beta Y_{it} + \delta E_{it} + \lambda_i + \mu_{it}$$

  - Y_{it} is per capita income
  - E_{it}, social welfare expenditure
  - α_t is a time-specific but country-invariant effect assumed to reflect technological advances
  - λ_i is a country-specific and time-invariant 'fixed effect'
  - δ is the marginal impact of social expenditure on living standards
  - μ_{it} is a random error term
- Task: estimate δ, the marginal impact of social expenditure on living standards.
- Note: no i subscripts on δ !!



CUP, 1999

- This is supposed to exist and be fixed.
- No subscripts on δ → It represents the strength of the effect direct government expenditure exerts on standard of living in any developing country at any time.
- But is there any such relationship given for developing countries, as though laid down by God in the Book of Nature [like the constant of gravity: G].
- NO
- There's no good reason to think there's any chance set-up that generates δ
- (You can of course always use statistics as what the word originally meant - a summary of some data.)

So....

- Much of our use of probability to derive exact conclusions in economics only makes sense in small worlds.
- Yet we often treat these as conclusions that hold more or less as stated in the real large world.
- Ie, we treat real settings as small worlds.

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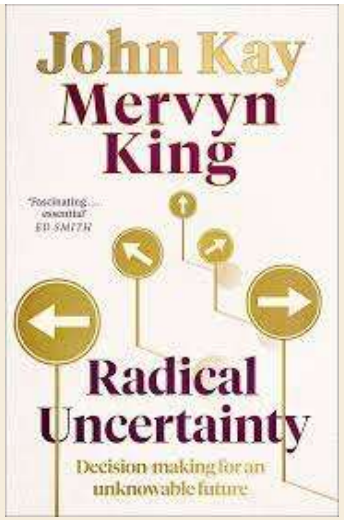

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What good then are small-world models?

- ‘[I]t’s value lies in framing a problem to provide insights into the large-world problem facing the policy-maker and not in the pretence that it can provide precise quantitative guidance.
- A small-world model is a fictional narrative, and its truth is found in its broad insights rather than its specific detail.
- These small-world models are analogies which help direct us to key features of larger worlds
- Many of the followers of [Chicago economist Robert] Lucas forgot that the purpose of building models is to use imagination so that we can tell plausible stories about the real world.’

My proposal

Follow these suggestions:

> *Re-express precise rigorously-established economics principles as qualitative generics.*
>
> *And export them as tendency principles.*

Tendency principle say not what happens when a factor is in play but what it tends to contribute.

Ala JS Mill

GREG MANKIW'S BLOG

Random Observations for Students of Economics

GREG MANKIW

UNITED STATES

I am the Robert M. Beren Professor of Economics at Harvard University.

... [A] table of propositions to which most economists subscribe, based on various polls of the profession... with the percentage of economists who agree:

1. A ceiling on rents reduces the quantity and quality of housing available. (93%)

2. Tariffs and import quotas usually reduce general economic welfare. (93%)

3. Flexible and floating exchange rates offer an effective international monetary arrangement. (90%)

4. Fiscal policy (e.g., tax cut and/or government expenditure increase) has a significant stimulative impact on a less than fully employed economy. (90%)

....

10. Cash payments increase the welfare of recipients to a greater degree than do transfers-in-kind of equal cash value. (84%)

11. A large federal budget deficit has an adverse effect on the economy. (83%)

12. A minimum wage increases unemployment among young and unskilled workers. (79%)

13. The government should restructure the welfare system along the lines of a “negative income tax.” (79%)

14. Effluent taxes and marketable pollution permits represent a better approach to pollution control than imposition of pollution ceilings. (78%)

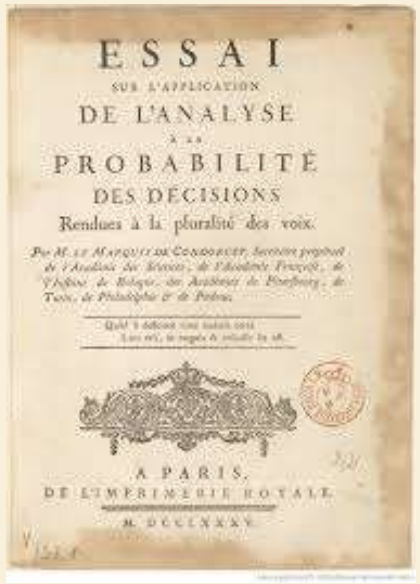
Example: Condorcet

Social mathematics → implementation of an Enlightenment social order with 'tangible, beneficial impact on the lives of ordinary people and on the advancement of public happiness'.

Political aims and ideals are to be 'transformed through the filter of mathematical calculation into the levers of decision-making, strategic planning and effective policy formulation'.

David Williams, *Condorcet and Modernity,* 2004

- ‘The laws of probability, combined with the increasing enlightenment of the individuals involved, and an unshakable confidence in the existence of objective moral truth, convinced Condorcet that
- Decisions taken by majority vote would lead to the right course of action…, whether in National Assemblies or in juries.’
- ‘Condorcet believed that the key factor was the absolute size of the majority, not the proportion of the size of the majority in relation to the total number of jurors.’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SUR L'APPLICATION
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DES DÉCISIONS
Rendues à la pluralité des voix.
A PARIS,
DE L'IMPRIMERIE ROYALE.
M. DCC.LXXXV.

David Williams, *Condorcet and Modernity,* 2004

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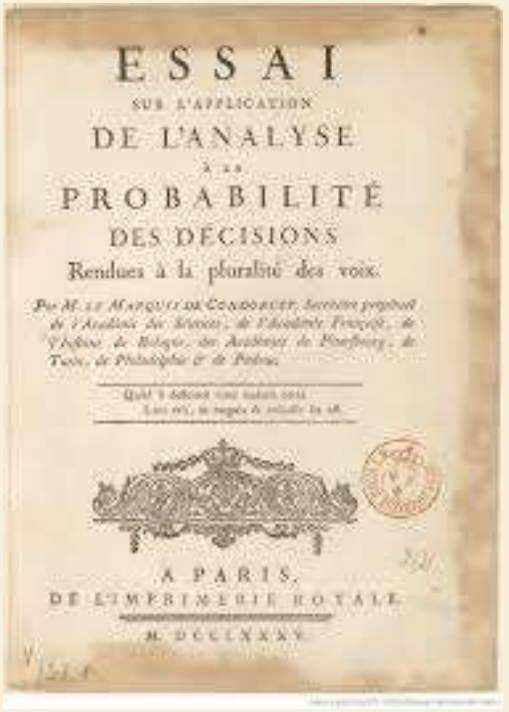
Condorcet used derivation from exact premises to get ....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Non-precise, non-exact conclusions

- ‘Decisions taken by majority vote would lead to the right course of action …, whether in National Assemblies or in juries.’
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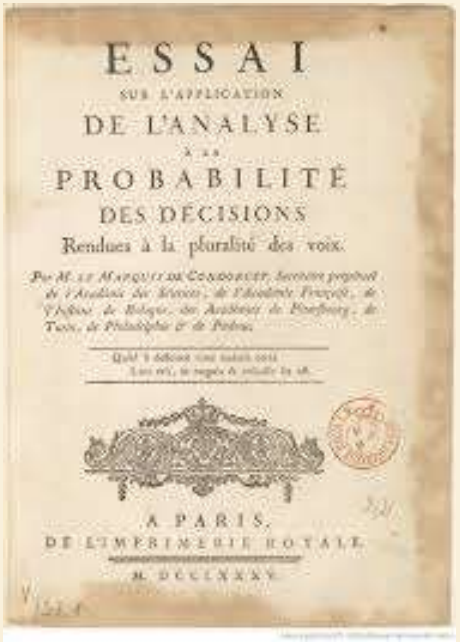
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David Williams, *Condorcet and Modernity,* 2004

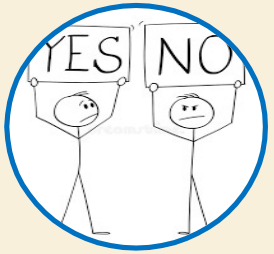
Condorcet's Jury Theorem (1785)

- n individuals each make a choice
- Choices are 'correctness' apt
- Options are binary (eg. guilty-or-innocent problem of juries)
- Majority voting
- Individual correctness events are (unconditionally) independent
- The (unconditional) individual correctness probability — the general competence — exceeds 1/2 and is the same for all individuals.

The probability of majority correctness increases in (odd) group size n and converges to 1.

Condorcet's theorem

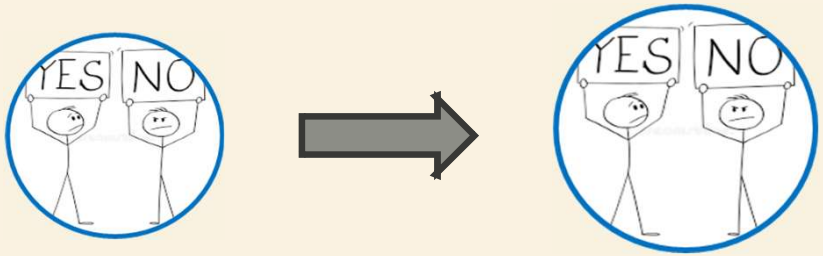
depicts



Relaxing Assumptions

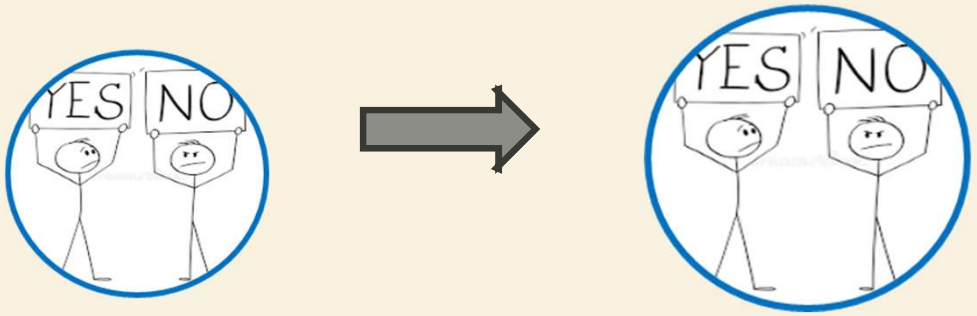
From Goodin and List (2001), *Epistemic Democracy: Generalizing the Condorcet Jury Theorem*

- A jury theorem still holds if not every member of the jury has exactly the same probability of choosing the correct outcome.



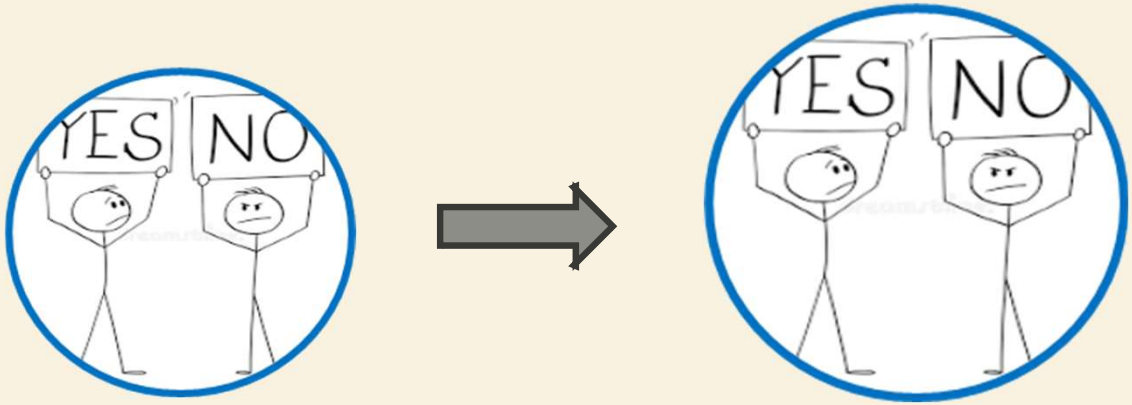
Relaxing Assumptions

- A jury theorem still holds if not every member of the jury has exactly the same probability of choosing the correct outcome. (All that is required is that the mean probability of being right across the jury be above one-half.)
- A jury theorem still holds even if there are interdependencies between the judgments of different electors.



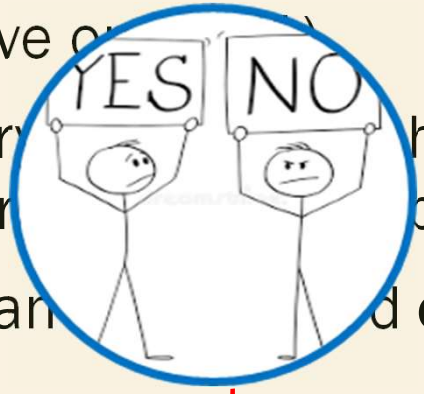
Relaxing Assumptions

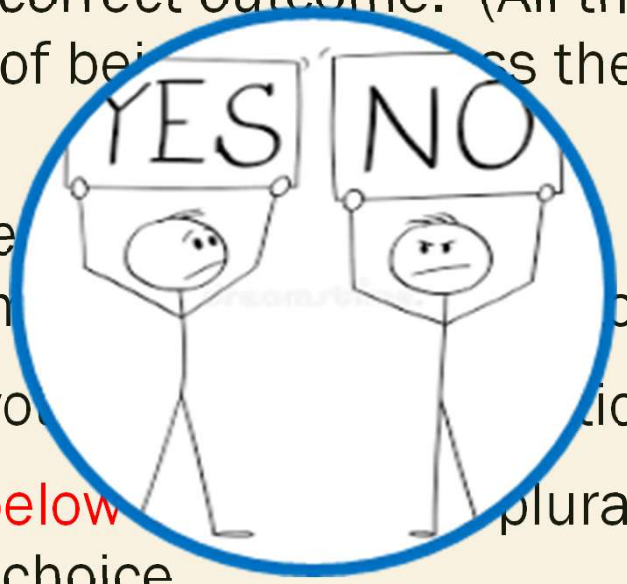
- A jury theorem still holds if not every member of the jury has exactly the same probability of choosing the correct outcome. (All that is required is that the mean probability of being right across the jury be above one-half.)
- A jury theorem still holds even if there are (certain sorts of) interdependencies between the judgments of different electors
- It can be extended to plurality voting among many options.



Relaxing Assumptions

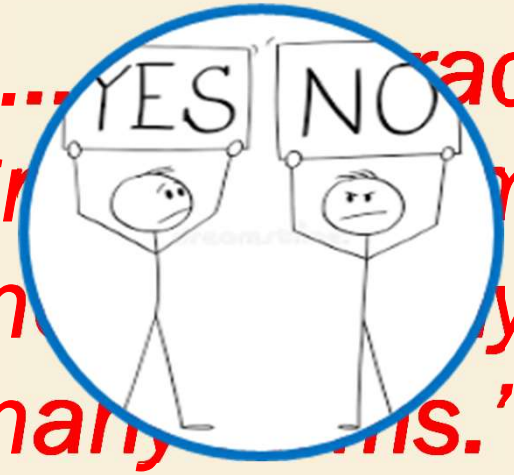
- A jury theorem still holds if not every member of the jury has exactly the same probability of choosing the correct outcome. (All that is required is that the mean probability of bei ss the jury be above c)
- A jur holds even if there inter between the judgn ors.
- It can d even to plurality vo tions.
- Voter competences can … drop well below plurality winner still be most likely the correct choice.





Or… dropping exactness and exporting the lesson as a tendency principle

‘…. racy has gr nic m y of its many ns.’



Robert Goodin & Christian List

Recall my proposal

Re-express precise rigorously-established economics principles as qualitative generics.

And export them as tendency principles.

For more on

- Generics & tendency principles
- How to use them with other knowledge to treat the real large world –

See N Cartwright, E Munro, J Pemberton

Causal Processes and their Warrant: A Practical Guide

Forthcoming, Cambridge Univ Press

TO CONCLUDE--
A SUMMARY

- Economics cannot generally be an exact science when it meets the world.
- It can be an exact science in small worlds.
- But not in large.
- We sometimes pretend it can, which makes problems for using knowledge.

- What we derive exactly in small worlds can serve as useful tendency principles
- To employ along with knowledge from other sources.
- So if we want economics to treat the world…

Don’t let exactness make economics queen.

SO…

- Is economics queen of the social sciences?
- NO
- But anyway
- She gets a lot more done
- Not sitting on a throne but
- Mucking in with the rest of the social sciences.

Thank you