Explanation and Reiss's Trilemma

Philosophy of Economics
University of Virginia
Matthias Brinkmann

Contents

Scientific Explanation

- What does it mean to explain something?
  - **Deductive-nomological (DN) Model**: derive the particular event in terms of general laws
  - **Causal Mechanism (CM) Model**: point to the causal mechanism which causes the particular event
  - **Unification Model**: explain how “everything hangs together”

Deductive-Nomological (DN) Model of Explanation

1.	Empirical Laws	$\forall x(Fx \rightarrow Gx)$
2.	Empirical Statements about Boundary Conditions	Fa
3.	Explanandum (follows by implication from 1, 2)	Ga

Adequacy Conditions

1. Argument must be deductively valid
2. Explanans must contain law(s)
3. Explanans must have empirical content
4. Explanans must be true

Deductive-Nomological (DN) Model of Explanation

1.	Empirical Laws	$\forall x(Fx \rightarrow Gx)$
2.	Empirical Statements about Boundary Conditions	Fa
3.	Explanandum (follows by implication from 1, 2)	Ga

Some Observations

- Central role for laws and causation
- Symmetry between explanation and prediction
- Only true premises can explain

Contents

Reiss's Trilemma

The following three claims are inconsistent:

1. Economic models are false (i.e., they rest on false assumptions about the world)
2. Economic models are explanatory
3. Only true models (i.e., those resting on true assumptions) can explain

(Reiss, Julian. "The Explanation Paradox." *Journal of Economic Methodology* 19, no. 1 (2012): 43–62.)

Reiss's Trilemma

1. **Economic models are false**
2. Economic models are explanatory
3. Only true accounts can explain

- Models vs Theories
  - if you think models cannot be false by themselves, the claim that they adequately represent reality certainly can
- Models misrepresent reality because they
  - fail to represent everything
  - represent objects in an idealised or impossible way
  - misrepresent the (causal) interactions between entities
  - contain entities, interactions and properties that do not actually exist

Reiss's Trilemma

1. Economic models are false
2. **Economic models are explanatory**
3. Only true accounts can explain

- Intuitive consensus: economic models "feel" explanatory
- Various Examples: Hotelling, Akerlof, Schelling, etc.

Reiss's Trilemma

1. Economic models are false
2. Economic models are explanatory
3. **Only true accounts can explain**

Why did the door open? Because John pressed the button.

- For this to be a good explanation,
  - there has to be a button
  - the button-pressing must be connected with the door-opening
- This follows from the DN and CR models, maybe not on the U model

Responses to the Trilemma

Deny (1) Economic models are true (in some sense) (Cartwright, Mäki)

Deny (2) Economic models do not explain (Alexandrova, Hausman, Aydinonat, Grüne-Yanoff)

Deny (3) Economic models, while false, still explain (Sugden)

Questions

- What is the philosophically most promising response to the dilemma?
- How would our image of economics change if we accepted any of the three ways out of the dilemma?
- Would anything need to change in how economics is practiced if accept any of the three ways of out of the dilemma?

Contents

Sugden's Rejection of Competing Views

- **Falsificationism**: Akerlof/Schelling-style modelling must look like "pseudo-science" on this view
- **Friedman**: The models don't make clear predictions, and it's hard to distinguish "assumptions" from "predictions" in these models
- **Conceptual Exploration**: The models are intended to explain reality to us
- **Models as Isolation**: these models do much more than isolate

  it does not seem right to say that the checkerboard model isolates some aspects of real cities by sealing off various other factors which operate in reality: just what do we have to seal off to make a real city – say Norwich – become like a checkerboard? (22)

Models as Caricatures

There is something about the idea of economic models as caricatures: models take features from the real world, but depict them in an exaggerated fashion (Gibbard/Varian)

Credible Worlds

- Inductive Inferences
  - From observing something about the housing market in Baltimore, Philadelphia ..., we make an inference about the housing market in NY
  - We make such inferences because the markets **are similar**
- Sugden's Guiding Idea: Inferences from Model to Reality
  - Why should we not be able to make an inference from an abstract model to concrete cases?
  - What we need is a similarity between model and reality

Models as Credible Worlds

We recognize the significance of the similarity between model cities and real cities, or between model markets and real markets, by accepting that the model world *could be* real – that it describes a state of affairs that is *credible*, given what we know [...] about the general laws governing events in the real world.

On this view, **the model is not so much an abstraction from reality as a parallel reality**. The model world is not constructed by starting with the real world and stripping out complicating factors: although the model world is simpler than the real world, the one is not a *simplification* of the other. (p. 25)

Two Schemata (p. 19)

Explanation

E1 – in the model world, R is caused by F

E2 – F operates in the real world

E3 – R occurs in the real world

[There is a credible similarity between real and model world]

Therefore, there is reason to believe:

E4 – in the real world, R is caused by F.

Prediction

P1 – in the model world, R is caused by F.

P2 – F operates in the real world.

[There is a credible similarity between real and model world]

Therefore, there is reason to believe:

P3 – R occurs in the real world.

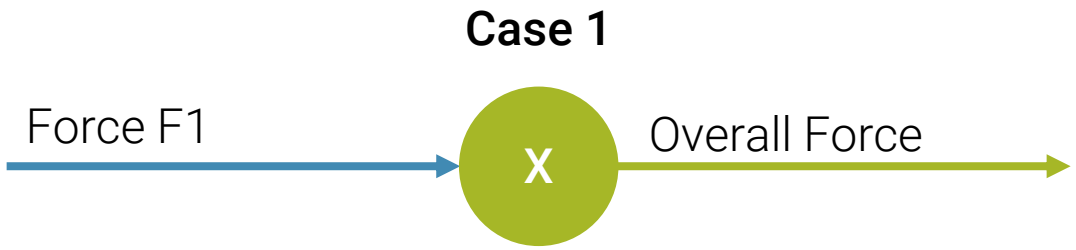
Problems

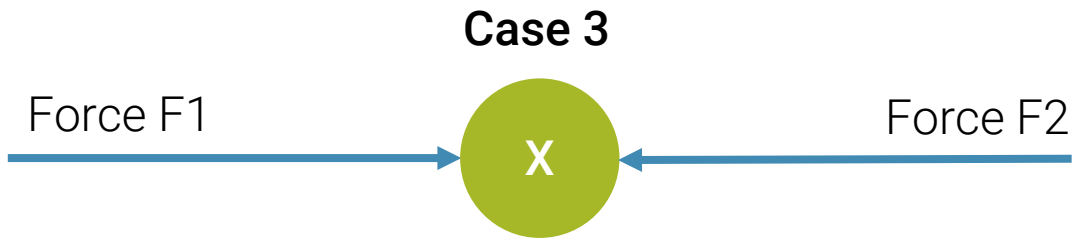
- The central notion of “credible worlds” is vague
  - credible = what is accepted by mainstream economists?
- Accounts of verisimilitude in the philosophy of science have been proven very difficult to state
- It’s not clear that inductive inferences from “credible worlds” are reliable
- Unrealistic assumptions come back: we should not use induction if we know that the inductive base is very different

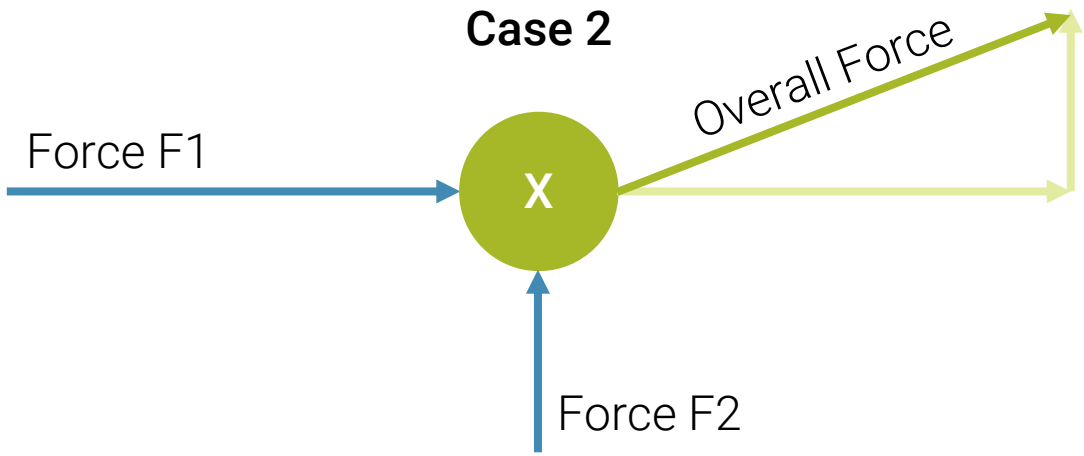
Contents

The Vector Case

Claim: “F1 pushes X towards the east (right)”







Mäki/Cartwright: Models as Isolations

- One interpretation of the Vector Case: we identify a true causal mechanism (a “tendency”, a “capacity”)
- “In an isolation, something [...] is ‘sealed off’ from the involvement or influence of everything else, a set Y of entities [...]” (Mäki)
- We achieve isolation by idealisation
  - Thought experiments isolate one causal mechanism
  - Experiments also tend to isolate one causal mechanism, but isolating certain mechanisms in practice is hard or impossible (especially in economics)

Interactions

In the Vector Case,

1. each causal factor is **independent**. F1 has the same effect on X no matter what and how many other forces are at work
2. each causal factor is **homogenous**. F1 and F2 can be understood in the same way—differences are merely quantitative
3. each causal factor is **causally effective**. Each force is exerting energy on X. This is true even in case 3, where F2 cancels out F1
4. there are **known laws of composition/interaction**. We know how other factors change the overall effect on X. This also means we can work our way back to identify disturbing forces.

Questions

1. Assume that F2 in case 3 is stronger than F1 (so that X is pushed to the west). Is it still true that F1 pushes X to the east?
2. What makes the Vector Model appealing?
3. How can we use the Vector Model to explain unrealistic assumptions in scientific models?
4. Do assumptions in economics largely follow the Vector Model?