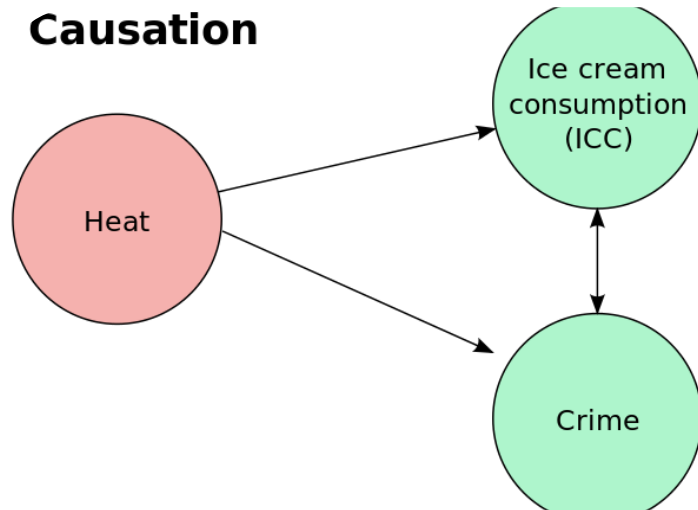**GEQ1000**

Economics

(Social Science)

2.1
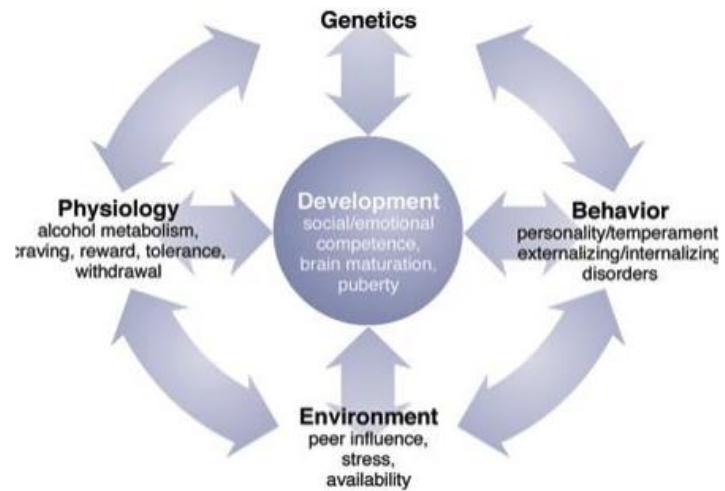# Models in Economics

Recap

Causation

X → Y? Hard!

Humans

Recap

Many factors

Human minds

Empirics and Theory
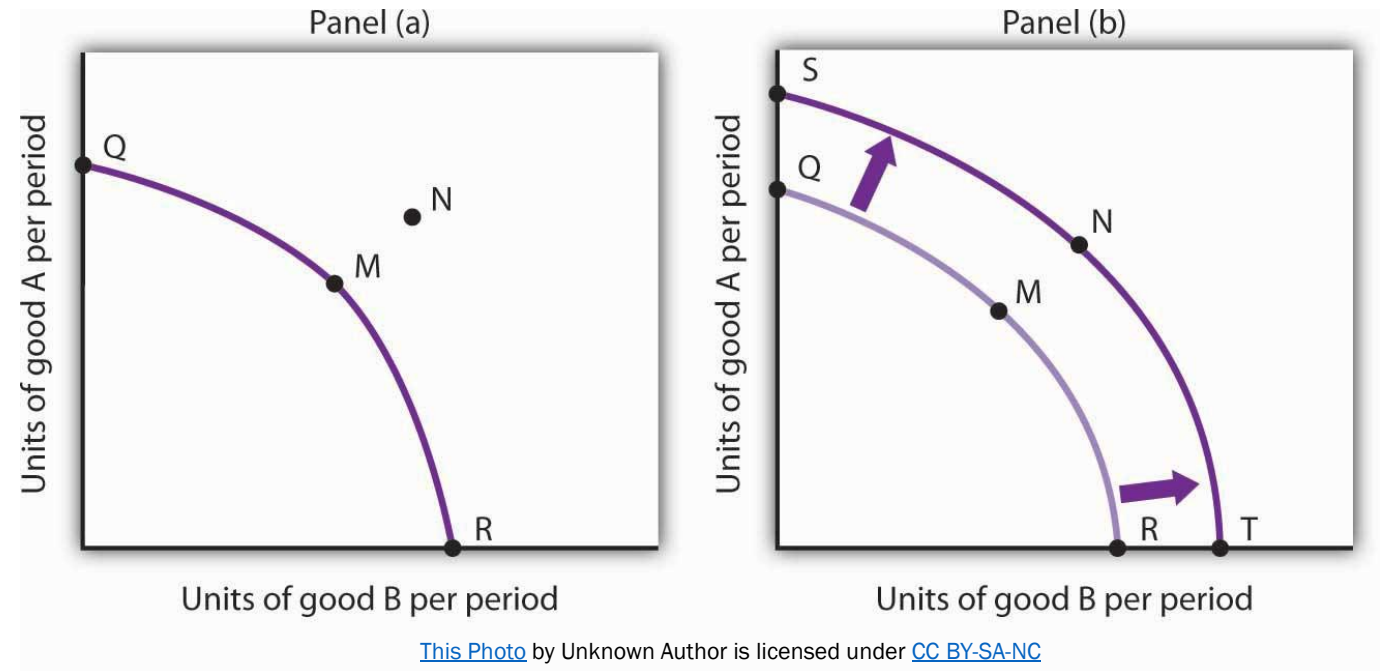
Empirics to test for causal effects

Theory to provide causal effects to test

Economists do it with models!

Karolina Kurkova

Economists do it with models!

Panel (a) / Panel (b): Production possibilities frontier diagrams with axes "Units of good A per period" (vertical) and "Units of good B per period" (horizontal), showing points Q, M, N, R in Panel (a) and S, Q, M, N, R, T in Panel (b).

What is a Model?

A simplified representation of the real world

Built by removing features deemed non-essential
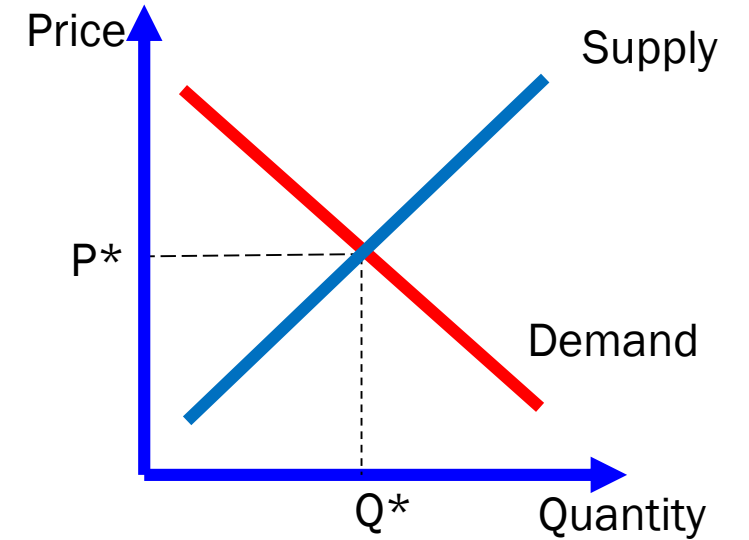
A Model

Reality

Remove unnecessary details →

Model

A Model

Reality

Remove unnecessary details →

Model

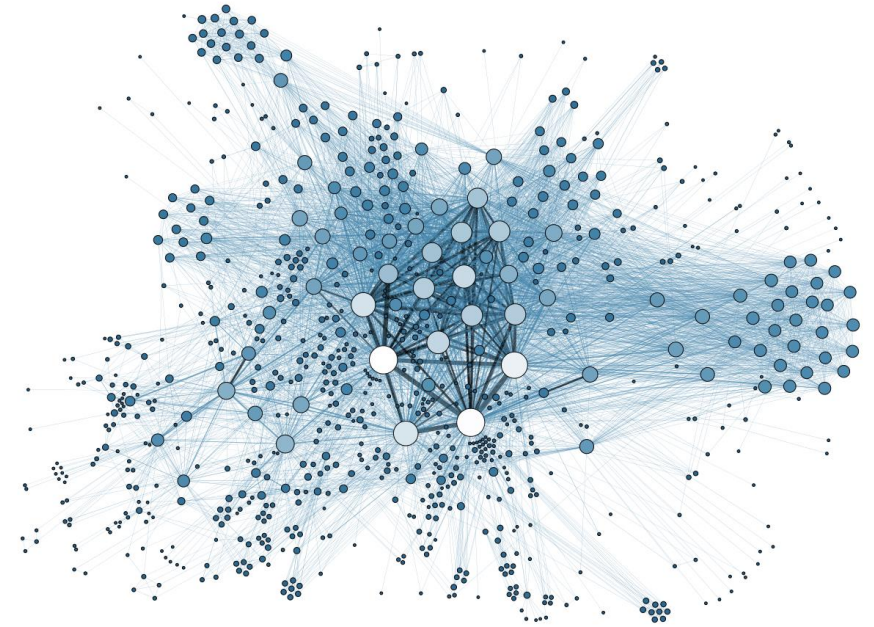$$Q_D = -\alpha P + \beta X + \epsilon$$
$$Q_S = \gamma P + \mu Y + \theta$$
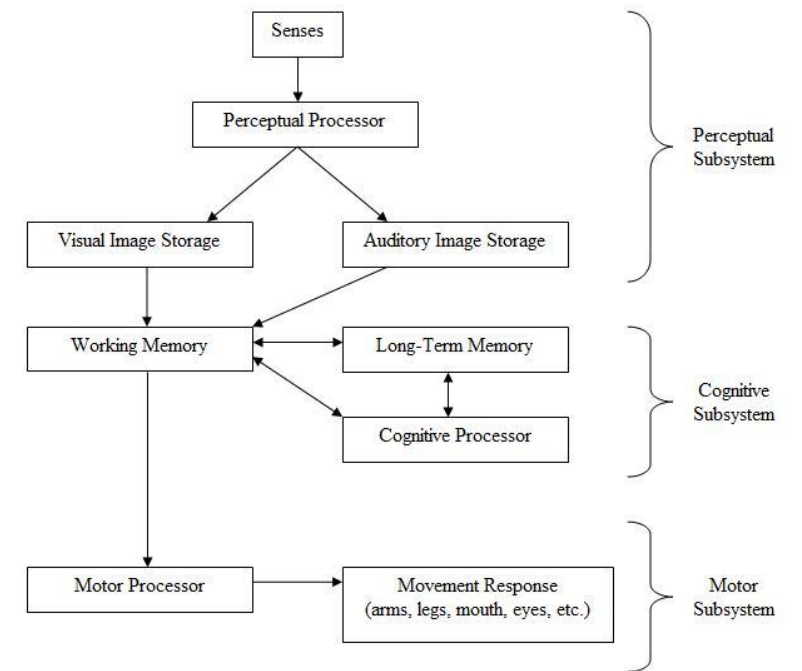
A Model

Reality

Remove unnecessary details →

Model

A Model

Reality

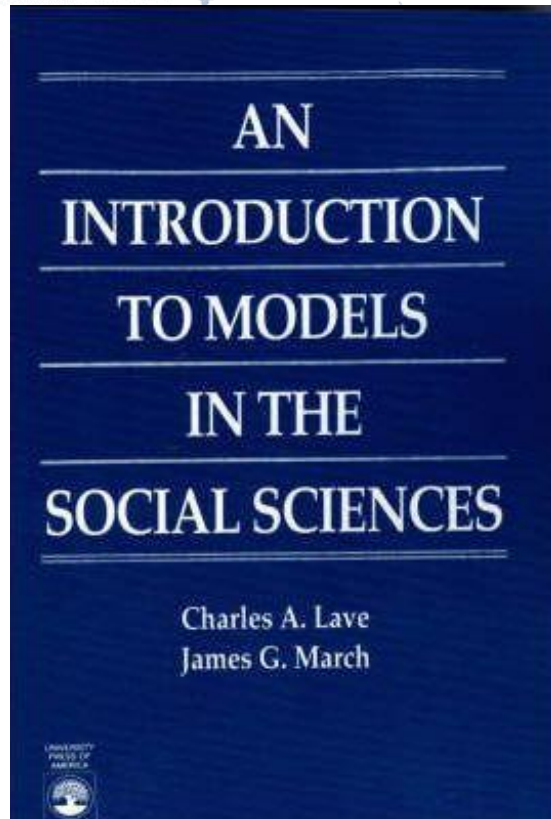Remove unnecessary details →

Model

Why use Models?

AN INTRODUCTION TO MODELS IN THE SOCIAL SCIENCES

Charles A. Lave
James G. March

"Man is capable of producing more complex behaviour than he is capable of understanding"

Lave & March, 1975

Models as Maps

… And then came the grandest idea of all! **We actually made a map of the country, on the scale of a mile to the mile!"**
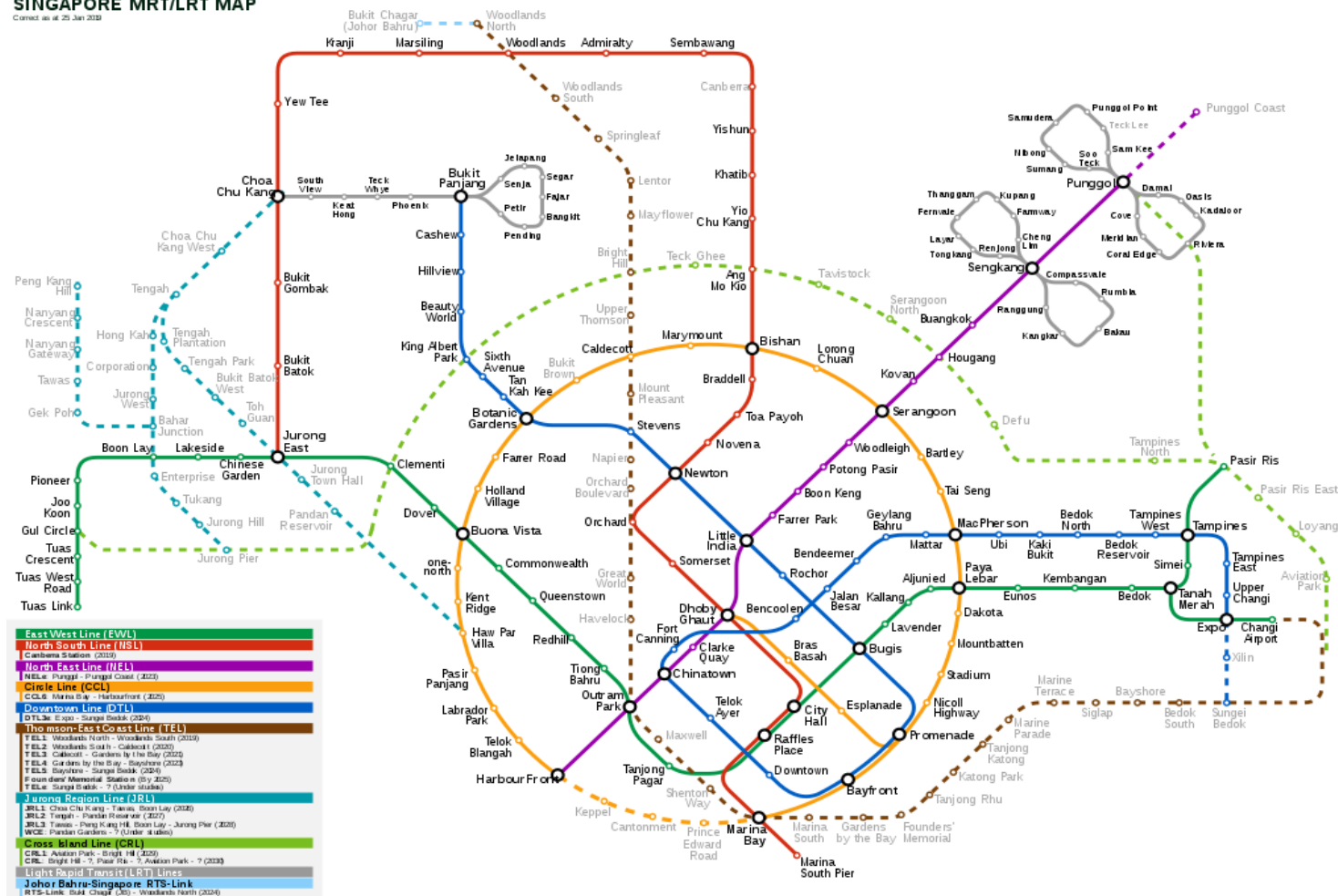
"Have you used it much?" I enquired.

"It has never been spread out, yet," said Mein Herr: "the farmers objected: they said it would cover the whole country, and shut out the sunlight! So we now use the country itself, as its own map, and I assure you it does nearly as well."

Sylvia and Bruno Concluded, by Lewis Carroll, 1893
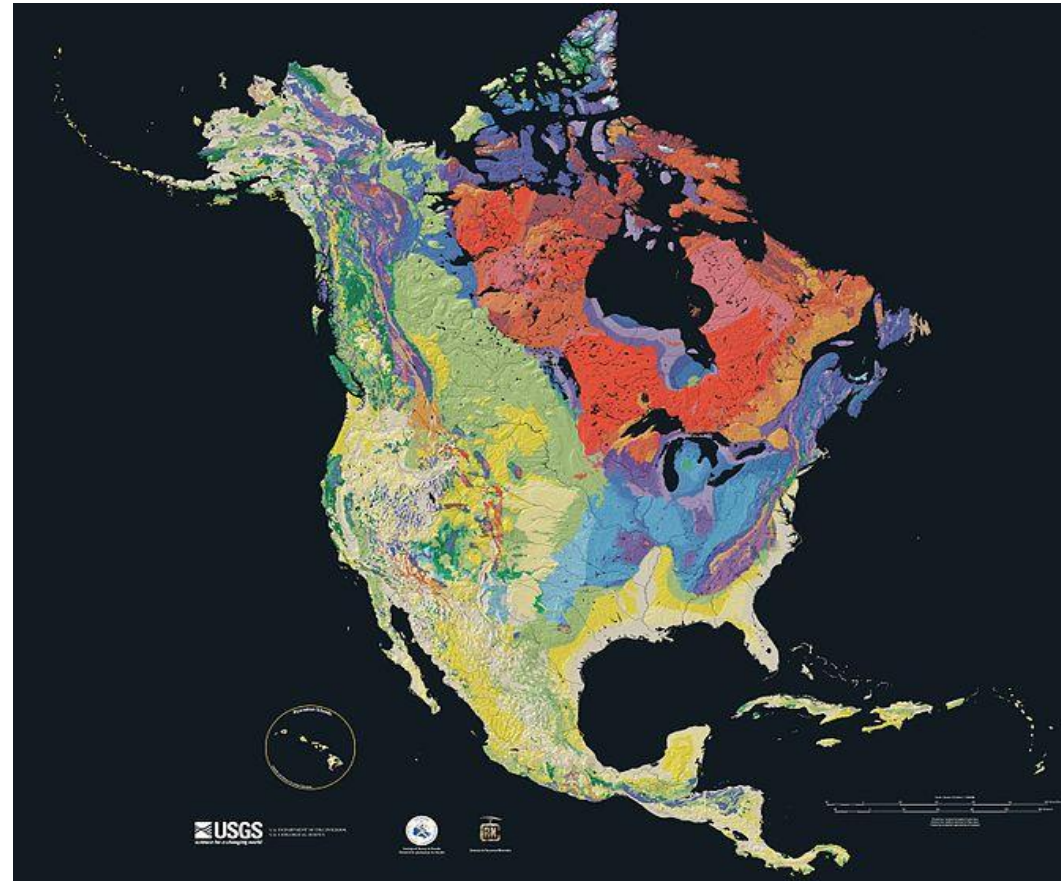
Different Purposes, Different Maps

Different Purposes, Different Maps

SINGAPORE MRT/LRT MAP

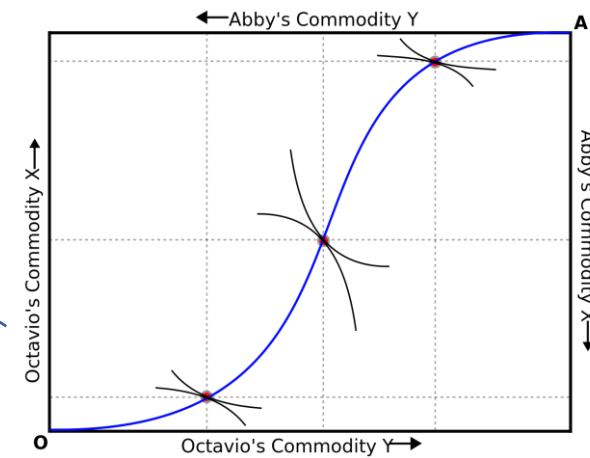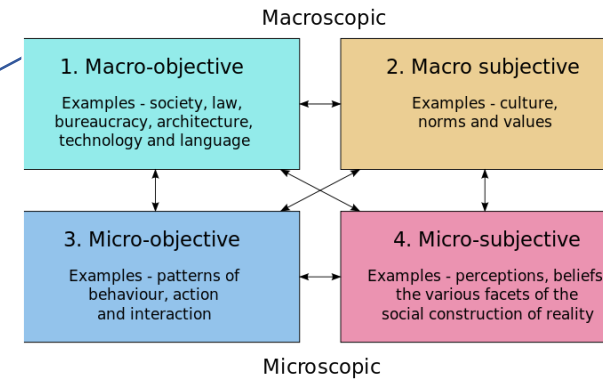# Different Purposes, Different Maps

All models are wrong ...

... but some are useful

George Box, *Empirical Model-Building and Response Surfaces*, 1987

Different Purposes, Different Models

Ritzer's integrative (micro-macro) theory of social analysis.

Macroscopic

1. Macro-objective	2. Macro subjective
Examples - society, law, bureaucracy, architecture, technology and language	Examples - culture, norms and values
3. Micro-objective	4. Micro-subjective
Examples - patterns of behaviour, action and interaction	Examples - perceptions, beliefs; the various facets of the social construction of reality

Microscopic

←Abby's Commodity Y   A

Octavio's Commodity X→

Abby's Commodity X→

O   Octavio's Commodity Y→

Models as experiments

Model as an artificial experimental environment

Neither experiment nor model = real life

In both cases we must argue that we are close enough to real life

We All Use Models!

Not just in the Social Sciences

- Engineering: aircraft models

- Computing: graph modelling

- In Physics: simple pendulum model

We All Use Models!

Our own **mental models**

Making one's model explicit

Write down the model

Work out its logic,
inconsistencies

Next up...
a famous model