

## What are Data?

“Data”: etymology, from the Latin, *dare*, to give. (singular *datum*, plural *data*). “That which is given”.

Data are generally not handed to us on a plate by nature (the story of Newton and the apple notwithstanding!). In the natural sciences data-collection often involves technologies of observation and of record that themselves embody previous hard-won scientific results. E.g. extracting the data from a collision in a particle accelerator, getting data from a quasar, collecting data on the genetic structure of wild grasses.

In economics, data are generally produced by computer-assisted bureaucracies, working on materials assembled from surveys, tax returns and the like. The set-up of the surveys depends on both economic theory and commercial practice.

So in what sense are data “given”? (Roughly) once they obtained, they can’t be messed with. If theory is in disagreement with the data, the data can’t be warped to match the theory; the theory will have to be adjusted, refined or perhaps rejected. (This may have to be qualified in various ways, but scientific fraud is generally detected fairly quickly.)

The a priori and the empirical. This theme is raised in the reading from Hume. “A priori” means “prior to experience”. Something known *a priori* is known by the exercise of reason alone, without requiring any sensory or experiential input.

Contrast with “empirical”: this means, “pertaining to, or founded upon, experiment or experience.”

Does this give us a clear-cut dichotomy? Some philosophers (Wittgenstein, Quine) think not.

*Exercise:* Consider the following statements. For each one, say whether you think it is a priori or empirical (or perhaps somewhere in between). Explain your view.

1. Two plus two equals four.
2. The car that just went by was red.
3. There can be no such thing as a round triangle.
4. There can be no such thing as a blue swan.
5. This desk is two feet from the wall.
6. The earth is 93 million miles from the sun.
7. The boiling point of water at sea level is 100 °Celsius.
8. The melting point of tungsten is 3422 °C.

9. A rational consumer will select that plan of action which appears likely to satisfy his/her desires to the greatest possible extent, given the available information.
10. A rational consumer will arrange his/her expenditure so as to equalize the marginal utility per dollar spent on each of the goods he/she consumes.
11. Consumers can generally be regarded as rational.
12. The government expenditure multiplier is greater in absolute magnitude than the tax multiplier.
13. Investment is the component of aggregate demand that shows the greatest degree of independent variation.
14. A high rate of interest discourages investment spending; a low rate of interest encourages investment.
15. A profit-maximizing firm equates marginal cost and marginal revenue.
16. Monopoly is detrimental to the pace of technical progress in an industry.

*Exercise:* From the field of microeconomics, identify one proposition that seems clearly a priori, and one that seems clearly empirical. Write them down, and be prepared to justify your choices.