

You can access the full *Doing Economics* eBook via this link: <https://www.core-econ.org/doing-economics/index.html>

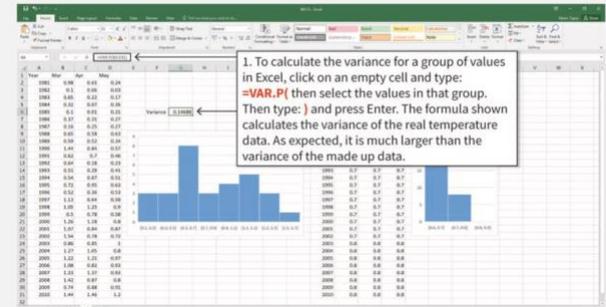
Overview

Through *Doing Economics*, students investigate policy issues using real-world data, and also experience a non-technical introduction to statistics and statistical software. *Doing Economics* is a collection of 12 standalone projects, each focused on a pressing social issue such as climate change, inequality, and wellbeing. Each project takes students through the steps needed to answer a research question, from downloading the raw data to generating and interpreting charts and tables, with step-by-step guidance (via annotated screenshots and walk-through videos) in R and Excel. By working on these projects, students develop transferable skills in data handling and presentation, and communicating to non-specialists, which will also improve their employability.

Key features of Doing Economics

1. Focus on intuitive, policy-relevant questions.
For example, Project 1 (climate change) asks ‘How can we measure the extent of climate change and determine what is causing it?’. Table 1 on the next page lists the projects and topics covered.
2. Intuitive explanation of statistical concepts.
 - Doing Economics focuses on intuition rather than mathematical formulas, and closely links concepts to use of statistical software and interpretation of the output.
 - Concepts such as p-values and confidence intervals can be tricky for beginning students. *Doing Economics* tries to avoid the binary statement of ‘statistically significant/not statistically significant’ and instead gets students to think about the likelihood that the variation occurred by chance, effect size, and correlation vs. causation.
3. Emphasis on practical implementation
 - Focus on how to use statistical software to answer the questions at hand, how to interpret the software’s output, and a non-technical explanation of how the software works (suitable for absolute beginners).

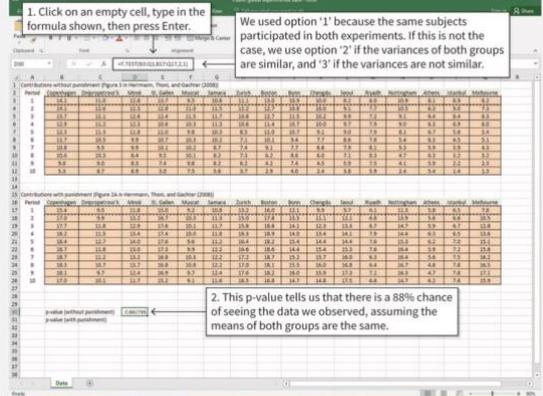
Some examples of annotated screenshots for Excel are shown below.



1. To calculate the variance for a group of values in Excel, click on an empty cell and type: `=VAR.P` (then select the values in that group. Then type `)` and press Enter. The formula shown calculates the variance of the real temperature data. As expected, it is much larger than the variance of the made up data.

Calculating and interpreting the variance

The variance is a measure of how spread out the data is. Just looking at the charts, we would expect the real temperature data to have a higher variance than the made up data. *Note:* There is a similar function in Excel called VAR.S, which is used to calculate the variance for other types of data. For this temperature data though, we will use VAR.P.



1. Click on an empty cell, type in the formula shown, then press Enter. We used option '1' because the same subjects participated in both experiments. If this is not the case, we use option '2' if the variances of both groups are similar, and '3' if the variances are not similar.

2. This p-value tells us that there is a 88% chance of seeing the data we observed, assuming the means of both groups are the same.

Calculate the p-value for Period 1 data

Excel's TTEST function will calculate the p-value for the two groups of cells selected. In the example shown, the formula to type is `=TTEST(B3:Q3,B17:Q17,2,1)`.

Using Doing Economics in your teaching

- Each empirical project in Doing Economics is divided into two or three parts. Each part can be completed independently (unless specified otherwise). The time needed to complete one part will depend on the structure and pace of the course, though as a rough guide, one project can be a term-long assignment.
- The projects can be done independently, since the same key concepts are repeated in a number of projects (see Table 2).
- The empirical projects can be used independently, or in conjunction with units in Economy, Society, and Public Policy and The Economy. Each project contains information about the unit to which the material is related, and has links to sections in the eBooks that may help students to understand the project.

| Project | Topic |
|---------|---|
| 1 | Measuring climate change |
| 2 | Collecting and analysing data from experiments |
| 3 | Assessing the effect of a sugar tax |
| 4 | Measuring wellbeing |
| 5 | Measuring economic inequality |
| 6 | Measuring management practices |
| 7 | Supply and demand |
| 8 | Measuring the non-monetary cost of unemployment |
| 9 | Credit-excluded households in a developing country |
| 10 | Characteristics of banking systems around the world |
| 11 | Measuring the WTP for climate change abatement |
| 12 | Government policies and popularity |

Table 1 List of *Doing Economics* projects and topics.

| Concept | Project(s) |
|--|--------------------|
| Summary statistics (mean, range, SD, variance) | 1, 4 |
| Percentiles | 1, 5, 6, 8, 9, 12 |
| Correlation (vs causation) | 1, 2, 3 |
| Hypothesis testing | 2, 6, 8, 9, 10, 11 |
| Gini coefficient/Lorenz curve | 5, 12 |
| Natural log transformation | 4, 7 |
| Dummy variables | 7, 9 |
| Differences-in-differences | 2, 3 |
| Other types of means (geometric, weighted) | 4, 10 |
| Box and whisker plots | 6, 10 |

Table 2 List of statistical concepts covered, and related projects.