What if...

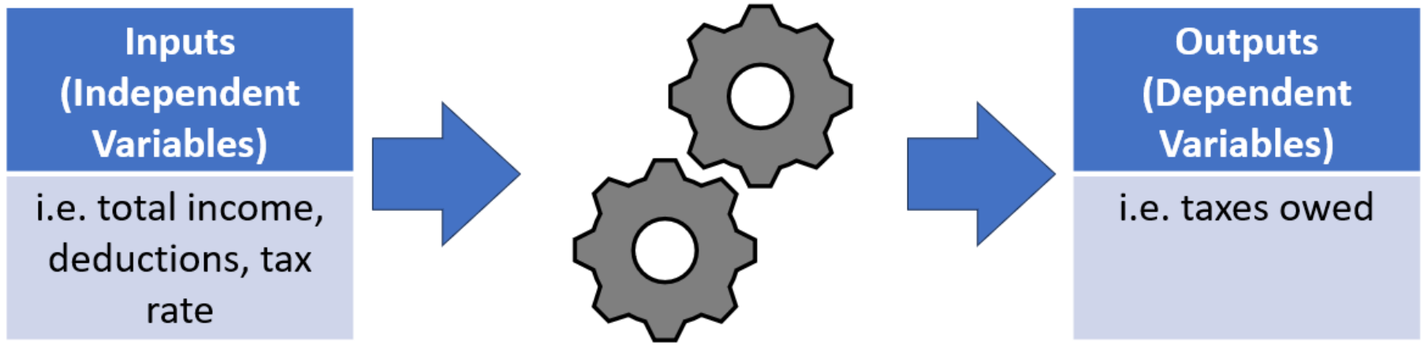
DATA ANALYSIS IN EXCEL

Nick Edwards
Analyst at Mynd

datacamp

What is scenario analysis?

- **Scenario analysis** is a type of what-if analysis that evaluates the impact of a dependent variable given one or more inputs.
  - Asks "**WHAT** is this **IF** that?"

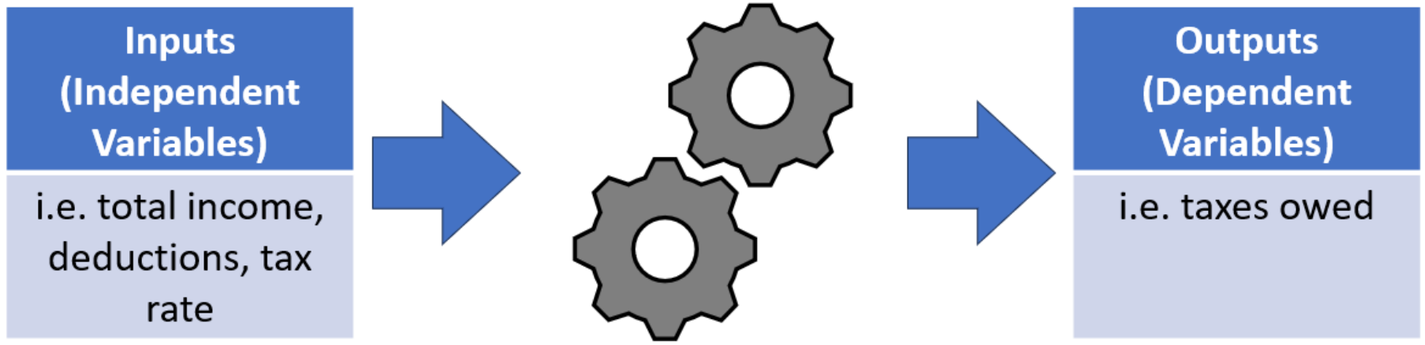


[1] https://www.investopedia.com/terms/s/scenario_analysis.asp

Dependent versus independent

- **Independent variables** derive their value from outside of the model
  - They are the inputs of the analysis
- **Dependent variables** derive their value from the model and rely on inputs
  - The observed output of the analysis

Example: `Taxes Owed = (Total Income - Deductions) * Tax Rate`



Sensitivity analysis

Sensitivity analysis is a type of what-if analysis that evaluates the impact of a dependent variable given a range of inputs.

- Is more open-ended than scenario analysis
- The goal is to understand how the dependent reacts to a range of input values.

[1] https://corporatefinanceinstitute.com/resources/knowledge/modeling/what-is-sensitivity-analysis/

Sensitivity table

Price Sensitivity

Supply \ Demand	1,000	2,000	3,000	4,000	5,000
1,000	$ 5.00	$ 10.00	$ 15.00	$ 20.00	$ 25.00
2,000	$ 2.50	$ 5.00	$ 7.50	$ 10.00	$ 12.50
3,000	$ 1.67	$ 3.33	$ 5.00	$ 6.67	$ 8.33
4,000	$ 1.25	$ 2.50	$ 3.75	$ 5.00	$ 6.25
5,000	$ 1.00	$ 2.00	$ 3.00	$ 4.00	$ 5.00

Sensitivity table

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Growth rate

- Finds the change in x between two periods

$$g = \frac{x_t - x_{t-1}}{x_{t-1}}$$

where:
g = growth rate
x = variable
t = time period

Example: Find the growth rate if total sales in year 1 is **$50M** and in year 2 is **$70M**.

1. `g = ($70M-$50M)/$50M`
2. `g = ($20M)/$50M`
3. `g = 0.4` or `40%`

Growth rate

$$x_{end} = x_{start} \times (1 + g)$$

where:
$g = growth\ rate$
$x = variable$

- Add `1` to `g` before multiplying!

Example: If total sales is **$90M** today, find what it would be at a 20% growth rate.

1. `x = $90M * (1 + 20%)`
2. `x = $90M * (1.2)`
3. `x = $108M`

Let's practice!

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What-if analysis in Excel

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Let's practice!

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