

What if...

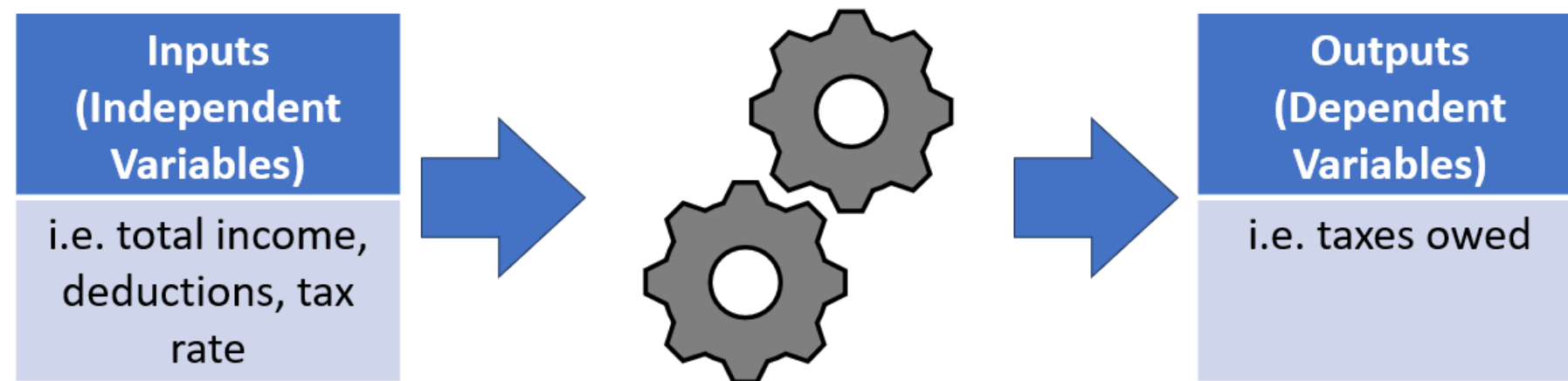
DATA ANALYSIS IN EXCEL



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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?"

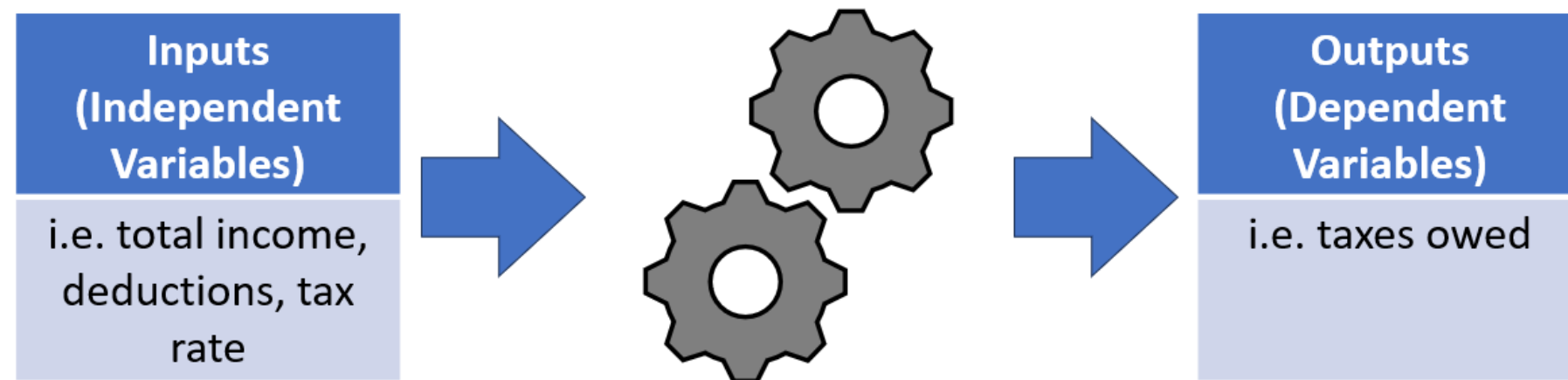


¹ https://www.investopedia.com/terms/s/scenario_analysis.asp

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: $\text{Taxes Owed} = (\text{Total Income} - \text{Deductions}) * \text{Tax Rate}$



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				
		Demand				
		1,000	2,000	3,000	4,000	5,000
Supply	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

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	4,000	\$ 1.25	\$ 2.50	\$ 3.75	\$ 5.00
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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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