

# What if...?

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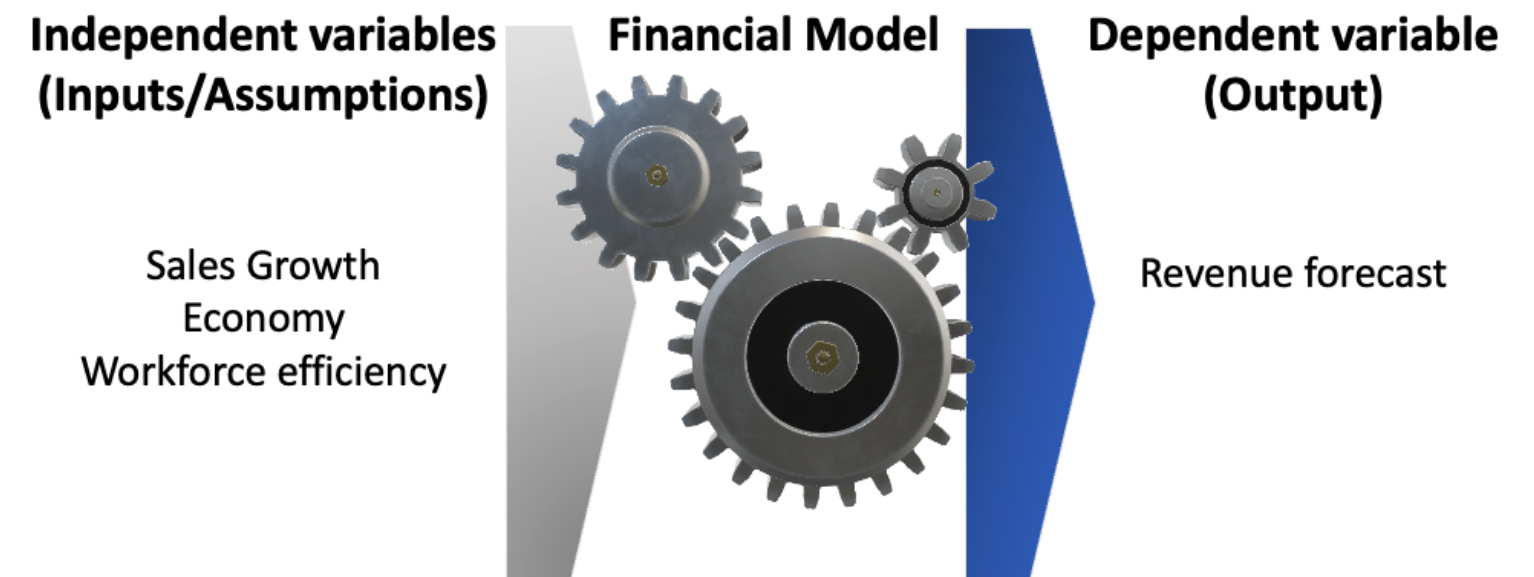


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# Scenario analysis

**Scenario analysis** is a type of *financial modeling* that evaluates the performance of a dependent variable given specific *assumptions* determined by the analyst.



## "What if" Analysis

- Goal seeking and validation
- i.e., what will revenue be if sales increase

## Stress Testing

- Input extreme scenarios to identify risks
- i.e., financial crisis, break even analysis

<sup>1</sup> [https://www.investopedia.com/terms/s/scenario\\_analysis.asp](https://www.investopedia.com/terms/s/scenario_analysis.asp)

# Forecasting in scenario analysis

**Forecasting** is the process of predicting or estimating a future outcome based on *assumptions*.

- Often used in scenario analysis
- Based on historical data

## Quantitative methodologies:

1. Straight Line
2. *Moving average*
3. *Regression analysis*

<sup>1</sup> <https://online.hbs.edu/blog/post/financial-forecasting-methods>

# Straight line forecasting

- Assumes the same growth rate
- Analysts usually use the last period's growth rate

$$F_t = x_{t-1} \times (1 + g)$$

**where:**

*F = Forecast*

*x = variable*

*g = growth rate*

*t = time period*

**Example:** Forecast 2022's revenue if 2021 revenue was \$100,000 and revenue growth in 2021 was 2%.

$$F = \$100,000 * (1 + 2\%)$$

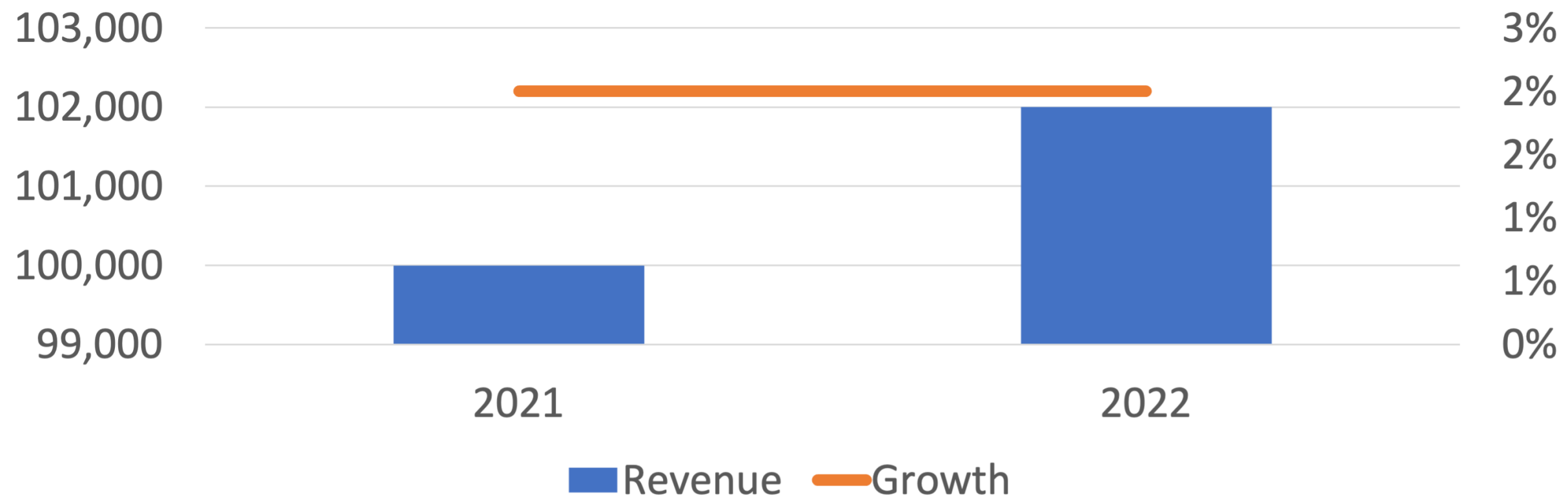
$$F = \$100,000 * (1.02)$$

$$F = \$102,000$$

<sup>1</sup> <https://online.hbs.edu/blog/post/financial-forecasting-methods>

# Straight line forecasting

- Growth is a *"straight line"*



# 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 revenue in 2019 is \$50mm and revenue in 2020 is \$70mm.

$$g = (70,000,000 - 50,000,000) / 50,000,000$$

$$g = (20,000,000) / 50,000,000$$

$$g = 0.4 \text{ or } 40\%$$

# Let's practice!

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# Scenario forecasting in Power BI

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# Sensitivity analysis

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# What is sensitivity analysis?

**Sensitivity analysis** evaluates the performance of a dependent variable given a range of inputs to understand their impact.

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

<sup>1</sup> <https://corporatefinanceinstitute.com/resources/knowledge/modeling/what-is-sensitivity-analysis/>

# Dependent versus independent

**Dependent variables** derive their value from the financial model and rely on *independent variables*.

- They are the observed output of the analysis.

**Independent variables** derive their value from outside of the financial model.

- They are the inputs of the analysis.

**Example:** Which are dependent and which are independent?

```
Revenue = Gross Sales + (Discount/Premium)
```

# 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

# Sensitivity table

		Price Sensitivity				
		Demand				
Supply		1,000	2,000	3,000	4,000	5,000
	1,000	\$ 5.00	\$ 10.00	\$ 15.00	\$ 20.00	\$ 25.00
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# Sensitivity table

## Price Sensitivity Demand

Supply	Demand					5,000
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# Sensitivity analysis in Power BI

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