SKEWNESS AND KURTOSIS

Lectured By- Dr. Anil Meel

12/06/2023

- Skewness literaly means lack of symmetary. Thus it helps us to understand the shape of distributions.

Types of Skewness

- Positive Skewness: Here the variation is more towards the higher value of variables. Mean is maximum and Mode is minimum.

- Negative Skewness: Here the variation is more towards the Lower value of variables. Mode is maximum and Mean is minimum

Indicators of Skewness

- Frequency curve is not Symmetrical bell shaped.
- Values of Mean, Median, and Mode do not coincide.
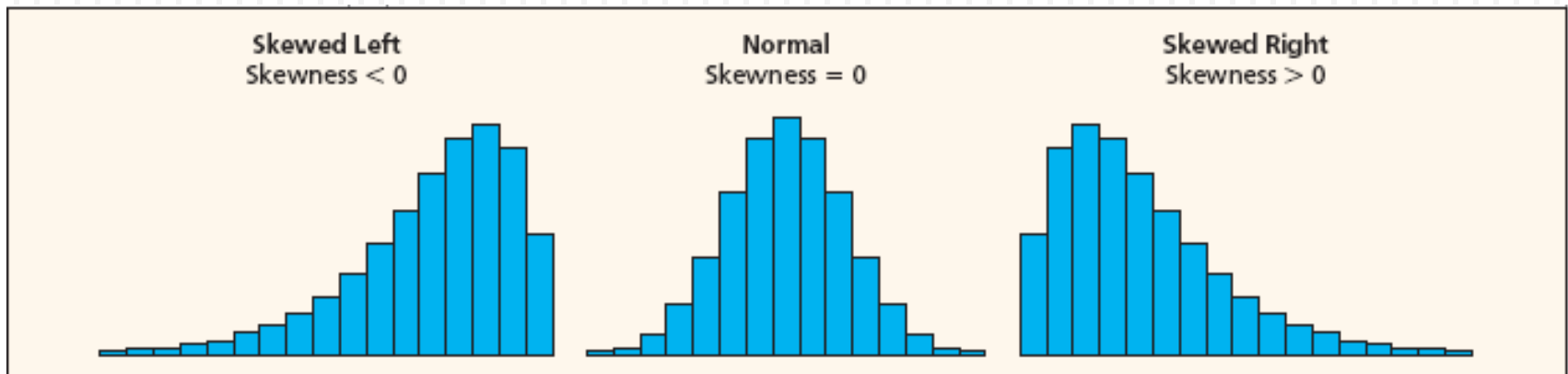- Sum of positive deviation is not equal to sum of negative deviation.

Measures of Skewness

☐ Karl Pearson's coefficient of skewness

$$S_k = \frac{\text{Mean} - \text{Mode}}{\text{Standard Deviation}}$$

Graphically presented

- Generally, *skewness* may be indicated by looking at the sample histogram or by comparing the mean and median.

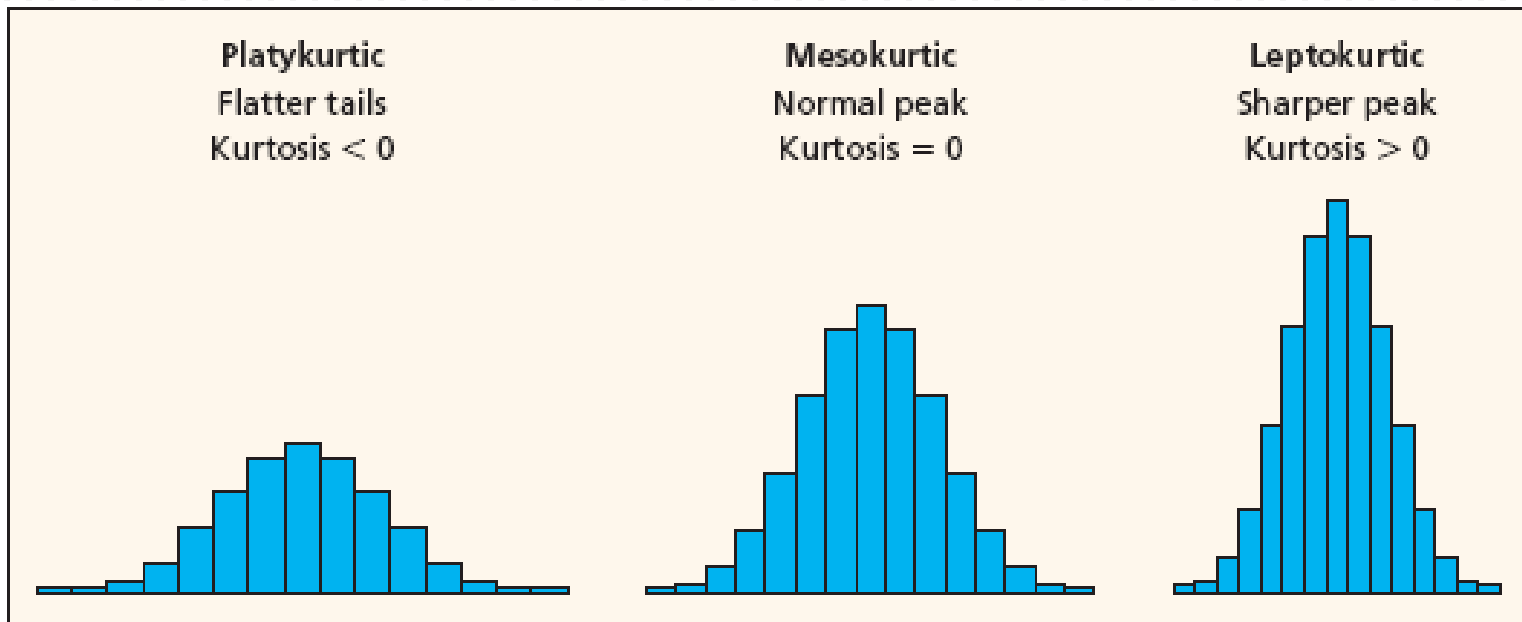| Skewed Left | Normal | Skewed Right |
| Skewness < 0 | Skewness = 0 | Skewness > 0 |

- This visual indicator is imprecise and does not take into consideration sample size n.

Kurtosis

- Kurtosis: It is concerened with the degree of Flatness or Peakedness in a curve.

Kurtosis

- *Kurtosis* is the relative length of the tails and the degree of concentration in the center.

- Consider three kurtosis prototype shapes.

Platykurtic	Mesokurtic	Leptokurtic
Flatter tails	Normal peak	Sharper peak
Kurtosis < 0	Kurtosis $= 0$	Kurtosis > 0

Types of Kurtosis

- Leptokurtic: A curve which is more peaked then the normal.
- Mesokurtic: A normal curve is called mesokurtic curve.
- PlatyKurtic: A flat curve than normal is called platykurtic.

Measures of Kurtosis

□

$$\beta_2 = \mu_4 / \mu_2^2$$

□ μ_4 = Forth moment about mean

□ $\mu_2 =$ Second moment about mean

Interpretation

- If $\beta_2 < 3$ Curve is Leptokurtic
- If $\beta_2 = 3$ Curve is Mesokurtic
- If $\beta_2 > 3$ Curve is PlatyKurtic