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ENSEIGNEMENT SUPÉRIEUR PRIVÉ D'INTÉRÊT GÉNÉRAL

# Management Control

## Management Control of Sales
### Method based on Annual Data


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# 4 Methods of Sales Forecasting

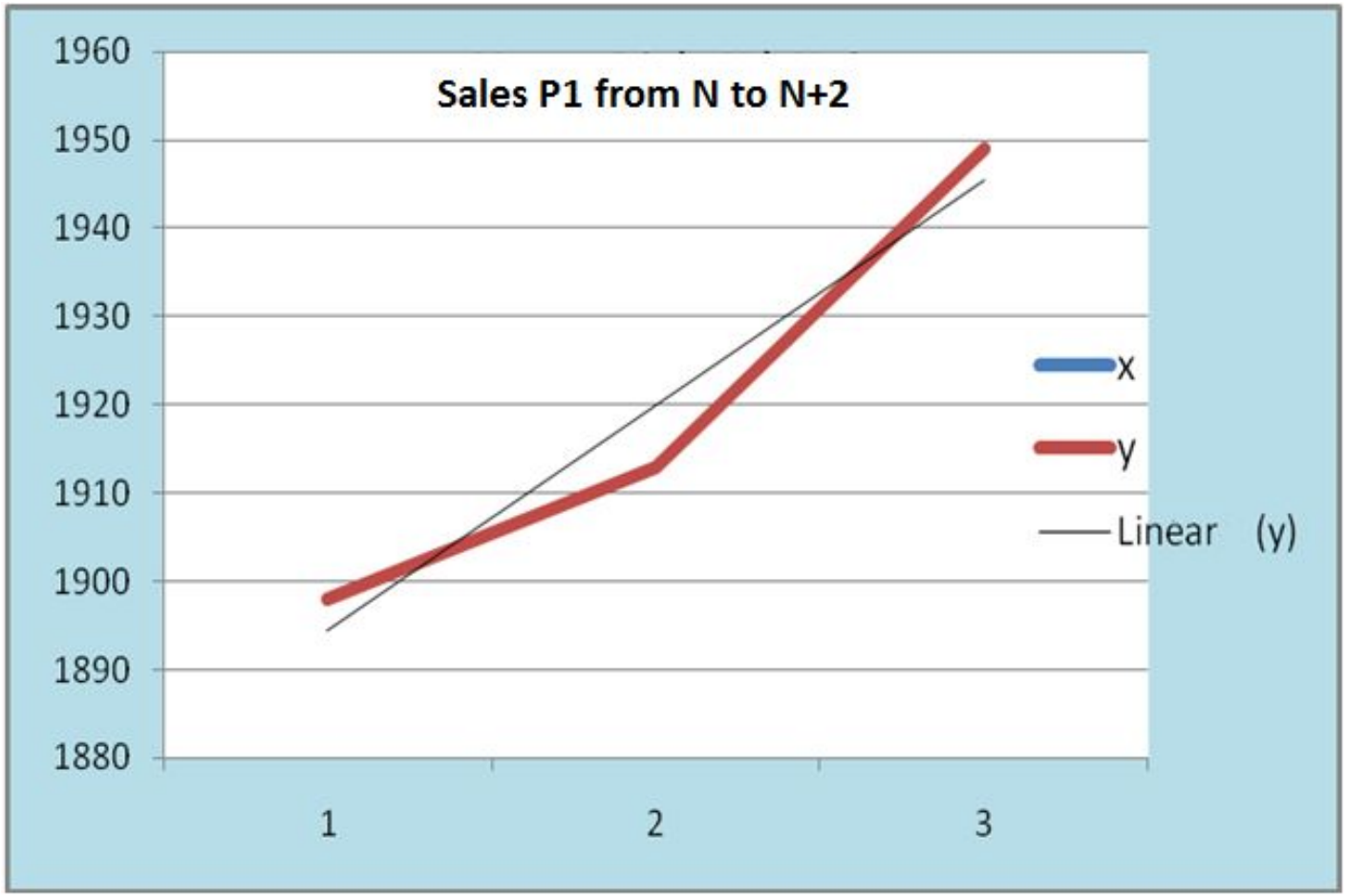
1. **Annual Data Method:**
   All calculations are first made using **the total sales for each year**. Then sales forecasts are given detail using calculations for the month or week depending on the company's needs

2. **Non-annual data method:**
   With this method, we start first using **monthly or weekly data** to find the sales forecast
3. **Rolling total method:**
   We take the historical data and create a new rolling set that adds a new month and drops the oldest month to obtain a new total. The forecast for the next year is made from these groups of **sliding data**
4. **Causal or correlation method**
   We look for an external variable that could explain our sales and on which we have reliable data. If we find a **strong link or relationship** using a calculation, we then calculate the forecast based on the external variable to forecast our sales

# 1st method : Sales forecasted based on ANNUAL DATA

- We use total annual historical sales data to calculate the sales forecast for the next year.

# 1st Method : Sales Forecasting based on Annual Data



# 1st Method : Sales Forecasting based on Annual Data

The following unit sales quantities were observed over the last 12 quarters.

Assuming that you use the linear adjustment method based on annual values,
**what will be the sales forecast by quarter for Year 4?**

| | Q1 | Q2 | Q3 | Q4 | Annual Total |
|---|---|---|---|---|---|
| Year 1 | 43 | 28 | 62 | 77 | 210 |
| Year 2 | 41 | 29 | 56 | 74 | 200 |
| Year 3 | 50 | 38 | 70 | 72 | 230 |
| Quarter Total | 134 | 95 | 188 | 223 | 640 |

# Sales Forecasting based on Annual Data - Linear Adjustment

1. **Calculation of the equation of the line:** $y = ax + b$

where **x = number of the year** and **y = Annual units sold**

$$a = \sum XY / \sum X^2 \text{ and } b = \text{average } y - (a * \text{average } x)$$

2. **To find the forecasted units for year 4,** **x = number of the year 4**

3. **Calculation of a monthly /quarterly/weekly seasonal factor:**

**sum or average for the month (quarter, week...) / sum or average for the year**

4. **Month sales forecast (quarter, week...) =.**

**Forecast for the year X monthly seasonal factor (quarterly, weekly...)**

## Assuming that you use the linear adjustment method based on annual values, what will be the sales forecast by quarter for Year 4?

| YEAR | x | y | X | Y | X * Y | $X^2$ |
|---|---|---|---|---|---|---|
| | | | | | | |
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| | |
|---|---|
| $a = \sum XY / \sum X^2$ | b = average y - a * average x |
| a = 20 / 2 = 10 | b = 213.33 - (10 * 2) = 193.33 |
| y = (a*x) + b | If x = 4, (10*4) + 193.33 = 233.33 |

| Quarter | Sales | Seasonal Factor | | Quarter Forecast |
|---|---|---|---|---|
| 1 | 134 | 20.94% | * 233.33 = | 48.85 |
| 2 | 95 | 14.84% | * 233.33 = | 34.63 |
| 3 | 188 | 29.38% | * 233.33 = | 68.54 |
| 4 | 223 | 34.84% | * 233.33 = | 81.30 |
| Total | 640 | 100% | | 233.33 |

## If you use the linear adjustment method based on annual values, what will be the sales forecast by quarter for Year 4?

## SOLUTION

| Year | x = # of year | y = Annual units sold | X = (x - average x) | Y = (y - average y) | X*Y | $X^2$ |
|---|---|---|---|---|---|---|
| 1 | 1 | 210 | -1 | -3.33 | 3.333333 | 1 |
| 2 | 2 | 200 | 0 | -13.33 | 0 | 0 |
| 3 | 3 | 230 | 1 | 16.67 | 16.66667 | 1 |
| **Total** | **6** | **640** | **0** | - | **20** | **2** |
| **Average** | 2 | 213.3333333 | | | | |
| | x | y | | | | |

| $a = \sum XY / \sum X^2$ | b = average y - a * average x |
|---|---|
| a = 20 / 2 = 10 | b = 213.33 - (10 * 2) = 193.33 |

$y = (a*x) + b$ If $x = 4$, $(10*4) + 193.33 = 233.33$

Units Forecasted for Year 4

134 units / 640 Total Units = 20.94%

| Quarter | Sales | Seasonal Factor | | Quarter Forecast |
|---|---|---|---|---|
| 1 | 134 | 20.94% | * 233.33 = | 48.85 |
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