

$$Y = a + bx + cx^2$$

Keterangan:

Y = Biaya Total (Total Cost)

X = Volume Produksi

b/c = Koefisien Regresi

a = Konstanta

Persamaan diatas dapat dicari dengan menggunakan:

$$\text{Persamaan I : } \Sigma Y = N \cdot a + b \cdot \Sigma x + c \cdot \Sigma x^2$$

$$\text{Persamaan II : } \Sigma XY = a \cdot \Sigma x + b \cdot \Sigma x^2 + c \cdot \Sigma x^3$$

$$\text{Persamaan III : } \Sigma X^2 Y = a \cdot \Sigma x^2 + b \cdot \Sigma x^3 + c \cdot \Sigma x^4$$

$$\text{Persamaan IV : Persamaan I} - \text{Persamaan II}$$

$$\text{Persamaan V : Persamaan II} - \text{Persamaan III}$$

$$\text{Persamaan VI : Persamaan IV} - \text{Persamaan V}$$

Nilai c dapat diperoleh dari persamaan VI, nilai b dapat diperoleh dari persamaan IV dan V, dan nilai a dapat diperoleh dari persamaan I, II, atau III. Persamaan-persamaan yang diperoleh dari lampiran 2:

$$\text{I} \quad : 22.218.240 = 12. a + 20.863.000 b + 36.378.019.000.000. c$$

$$\text{II} \quad : 38.708.396.150.000 = 20.863.000. a + 36.378.019.000.000 b + 63.609.918.247.000.000.000. c$$

$$\text{III} \quad : 67.631.802.132.680.000.000 = 36.378.019.000.000 a + 63.609.918.247.000.000.000 b + 111.529.318.871.011.000.000.000.000. c$$

Substitusikan Persamaan I dan Persamaan II, akan diperoleh Persamaan IV dengan cara:

**Persamaan IV:**

$$\text{I.} \quad 22.218.240 = 12. a + 20.863.000 b + 36.378.019.000.000 c$$

$$\text{II.} \quad 38.708.396.150.000 = 20.863.000 a + 36.378.019.000.000 b + 63.609.918.247.000.000.000 c$$

$$\text{I.} \quad \times 1.738.583$$

$$\text{II.} \quad \times 1$$

$$\begin{aligned}
 \text{I.} \quad & 38.627.254.353.920 = 20.863.000. a + 36.272.057.129.000. b + 63.246.205.407.077.000.000. c \\
 \text{II.} \quad & \underline{38.708.396.150.000 = 20.863.000. a + 36.378.019.000.000. b + 63.609.918.247.000.000.000. c} - \\
 & - 81.141.796.080 = 0 - 105.961.871.000. b - 363.712.839.923.000.000. c
 \end{aligned}$$

**Persamaan V:**

$$\begin{aligned}
 \text{II.} \quad & 38.708.396.150.000 = 20.863.000. a + 36.378.019.000.000. b + 63.609.918.247.000.000.000 c \\
 \text{III.} \quad & 67.631.802.132.680.000.000 = 36.378.019.000.000. a + 63.609.918.247.000.000.000. b + 111.529.318.871.011.000.000.000.000. c \\
 & \text{II.} \quad \times 1.743.662 \\
 & \text{III.} \quad \times 1 \\
 \text{II.} \quad & 67.494.359.447.701.300.000 = 36.378.019.000.000. a + 63.430.969.365.578.000.000. b + 110.914.197.270.400.514.000.000.000. c \\
 \text{III.} \quad & \underline{67.631.802.132.680.000.000 = 36.378.019.000.000. a + 63.609.918.247.000.000.000. b + 111.529.318.871.011.000.000.000.000. c} - \\
 & - 137.442.684.978.700.000 = 0 - 178.948.881.422.000.000. b - 615.121.600.610.486.000.000.000. c
 \end{aligned}$$

**Persamaan VI:**

$$\text{IV.} \quad -81.141.796.080 = 0 - 105.961.871.000. b - 363.712.839.923.000.000. c$$

$$\text{V.} \quad -137.442.684.978.700.000 = 0 - 178.948.881.422.000.000. b - 615.121.600.610.486.000.000.000. c$$

$$\text{IV.} \quad \times 1.688.804$$

$$\text{V.} \quad \times 1$$

$$\text{IV.} \quad -137.032.589.787.088.320 = -178.948.881.422.000.000. b - 614.239.698.913.322.092.000.000. c$$

$$\text{V.} \quad -137.442.684.978.700.000 = -178.948.881.422.000.000. b - 615.121.600.610.486.000.000.000. c \quad -$$

$$410.095.191.611.680 = 881.901.697.163.908.000.000. c$$

$$c = \frac{410.095.191.611.680}{881.901.697.163.908.000.000}$$

$$c = 0,000000468$$

Persamaan IV masukkan c:

- $81.141.796.080 = -105.961.871.000. b - 363.712.839.923.000.000. c$
- $81.141.796.080 = -105.961.871.000. b - 363.712.839.923.000.000. (0,000000468)$
- $81.141.796.080 = -105.961.871.000. b - 170.217.609.084$
- $81.141.796.080 + 170.217.609.084 = -105.961.871.000. b$

$$89.075.813.004 = -105.961.871.000. b$$

$$b = \frac{89.075.813.004}{-105.961.871.000}$$

$$b = -0,8406402432$$

Dari persamaan I masukkan nilai b dan c akan diperoleh nilai a:

$$I \quad 22.218.240 = 12. a + 20.863.000 b + 36.378.019.000.000. c$$

$$22.218.240 = 12. a + 20.863.000 (-0,8406402432) + 36.378.019.000.000 (0,000000468)$$

$$22.218.240 = 12. a - 17.538.277 + 17.024.913$$

$$22.218.240 = 12. a - 513.364$$

$$22.218.240 + 513.364 = 12. a$$

$$22.731.604 = 12. a$$

$$a = \frac{22.731.604}{12}$$

$$a = 1.894.300,3333$$

Dengan diketahui nilai a, b dan c maka fungsi Biaya (TC) adalah:

$$TC = a + bx + cx^2$$

$$TC = 1.894.300,3333 - 0,8406402432x + 0,000000468x^2$$