

EE425 (1/2012)

An Example of Heteroscedastic Disturbance

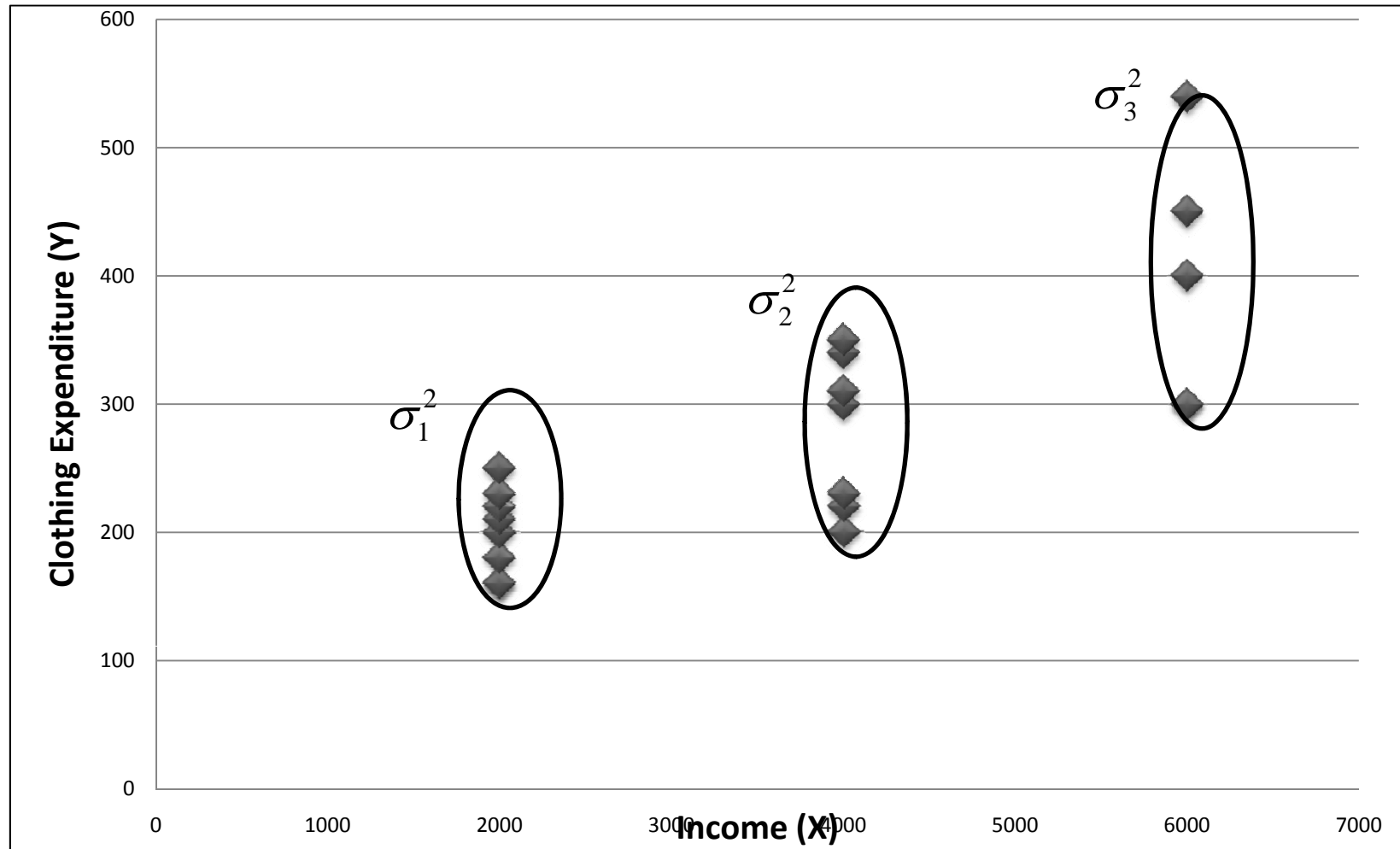
# Data

<b>Group 1 (n1 = 8)</b>	
Income(x)	Clothing Expenditure (y)
2000	160
2000	160
2000	180
2000	200
2000	210
2000	220
2000	230
2000	250

<b>Group 2 (n2 =7)</b>	
Income(x)	Clothing Expenditure (y)
4000	200
4000	220
4000	230
4000	300
4000	310
4000	340
4000	350

<b>Group 3 (n3 = 5)</b>	
Income(x)	Clothing Expenditure (y)
6000	300
6000	300
6000	400
6000	450
6000	540

# Plotting the Data



# OLS Estimation

$$\text{Model: } Y_{ij} = \alpha + \beta X_i + u_i \quad , \text{ where } \begin{array}{l} i = 1, 2, 3 \\ j = 1, 2, \dots, n_i \end{array}$$

$$\left. \begin{array}{l} m = 3 \\ n_1 = 8 \\ n_2 = 7 \\ n_3 = 5 \end{array} \right\} \sum_{i=1}^m n_i = 20 = n$$

$$\text{From OLS; } \begin{array}{l} Y = 98.7649 + 0.0483(X) \\ \text{(s.e.) } \quad (36.38) \quad \quad (0.01) \end{array}$$

# Standard Deviations of $Y_i$

$$S_i^2 = \frac{1}{n_i - 1} \sum_{j=1}^{n_i} (Y_{ij} - \bar{Y}_i)^2$$

$$S_1^2 = \frac{1}{8-1} (7487.50) = 1069.64$$

$$S_2^2 = \frac{1}{7-1} (22285.71) = 3714.29$$

$$S_3^2 = \frac{1}{5-1} (42080.00) = 10520.00$$