**Indian Statistical Institute**

**BSDS: 2024-26**

**First Year: Semester – II**

**Economics-II**

**Practical Exercise 8**

03 April 2025

1. Size distributions of PCE (per capita total consumer expenditure on all items per 30 days) are shown below for rural India. Apply the method of quantiles to estimate the parameters of the underlying lognormal distributions. Hence, compute Lorenz Ratio.

# **Table 1: Per Thousand Distributions of Persons Over Classes of PCE:**

# **All India rural**

|  |  |
| --- | --- |
| **PCE (Rs.)** | **Number of people (per thousand)** |
| 000 – 065 | 19 |
| 065 – 080 | 31 |
| 080 – 095 | 46 |
| 095 – 110 | 89 |
| 110 – 125 | 94 |
| 125 – 140 | 101 |
| 140 – 160 | 122 |
| 160 – 180 | 96 |
| 180 – 215 | 123 |
| 215 – 280 | 139 |
| 280 – 385 | 94 |
| 385 – . | 46 |

**Answer:** For estimation of parameters, we use Method of Quantiles.

Here we equate two chosen quantiles, say, and to the theoretical expressions for the corresponding true quantiles and solve the equations for and .

We take = 0.27 and = 0.73 for estimation of .

We take = 0.07 and = 0.93 for estimation of .

|  |  |  |
| --- | --- | --- |
| **Income Class** | **Relative Frequency**  **()** | **Cum. Rel. frequency**  **()** |
| 000 – 065 | 0.019 | 0.019 |
| 065 – 080 | 0.031 | 0.050 |
| **080 – 095** | **0.046** | **0.096** |
| 095 – 110 | 0.089 | 0.185 |
| **110 – 125** | **0.094** | **0.279** |
| 125 – 140 | 0.101 | 0.380 |
| 140 – 160 | 0.122 | 0.502 |
| 160 – 180 | 0.096 | 0.598 |
| 180 – 215 | 0.123 | 0.721 |
| **215 – 280** | **0.139** | **0.860** |
| **280 – 385** | **0.094** | **0.954** |
| 385 – . | 0.046 | 1 |