Adv. Microeconometrics Computer Assignment

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1 - Size distortions

Simulate data from the following model:

$$
\begin{aligned}
Y &= X\beta + \varepsilon \\
X &= Z\Pi + V
\end{aligned}
$$

where: * Y and X are $n \times 1$ vectors which contain the endogenous variables; * Z is a $n \times k$ matrix of instruments; * ε and V are $n \times 1$ vectors that contain disturbances. * The different rows of $\begin{pmatrix} \varepsilon \vdots V \end{pmatrix}$, are independently normally distributed, i.e.,

$$
\begin{pmatrix} \varepsilon_i \\ V_i \end{pmatrix} \sim \mathcal{N}(0, \Sigma), \qquad \Sigma = \begin{pmatrix} 1 & \vdots & \rho \\ \rho & & 1 \end{pmatrix}
$$

* $n = 100$, $k = 10$, $\Pi = a \times e_{10}$ with $e_{10} \in \mathbb{R}^{10}$ whose first element is 1 and the remaining are equal to zero. * All elements from Z are independently distributed and follows a standard normal distribution. * $a \in \{0.3, .0.25, 0.2, 0.15, 0.1, 0.05, 0\}$ * $\rho \in \{0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 0.95\}$