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A Distance and a Binary Relation Related to Income Comparisons

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Abstract. We define a distance and a binary relation among income distributions which is closely related to Lorenz dominance. An income distribution is represented by a vector $(x_1, x_2, \ldots, x_n)$ when the society under consideration consists of n individuals or households. The component x_i denotes the income of the i-th individual and the sum $\sum_{i=1}^{n} x_i$ is the total wealth of the society. The distance is defined on the n-dimensional Euclidean space R^n mathematically, and it gives indices of difference between two income distributions with not only the same total wealth but also the different total wealths. Thus, the distance might give a criterion for income distributions taking account of equity and efficiency.

Key words: Lorenz dominance, distance, binary relation, minimax theorem