

## Stochastic Dominance

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The concept of Stochastic Dominance (SD) appeared in Economics in the context of the study of income distribution, where it provided various criteria for ranking income distributions according to classes of social welfare functions. Although stochastic dominance is still much in use for studies of income distribution and of poverty, more recently it has also found uses in financial economics, where it is used to rank returns from different assets.

Much earlier, a particular index was proposed as a good measure of income inequality, namely the Gini index. Not all economic theorists shared the view that the Gini was a good measure, and so other measures were proposed that had various desirable properties. Traditionally, an axiomatic approach has been used for this purpose.

In this course, I will begin by defining SD of different orders, and will give ethical interpretations of the definitions. There is considerable similarity between the analysis of complete distributions of income and the analysis of poverty, and I will review some of this material.

It was only after the usefulness of SD had been established for theorising about the welfare implications of different income distributions that econometricians turned their attention to the task of performing statistical inference on the available data. Although there are very large data sets with information about household incomes in most developed countries, there are still questions that one can reasonably ask for which sampling randomness makes it impossible to find definitive answers. In less developed countries, samples are typically, but not always, smaller, with the result that sampling randomness is again an issue. This implies that statistical inference is needed to distinguish between properties of income distributions for which there is strong evidence and those for which it is unsafe to reach definite conclusions on the basis of available data.

I will develop the mathematical and statistical foundations necessary for performing statistical inference with income data, not only for SD but also for specific indices, including the Gini index. As usual in econometrics, most of the theory is asymptotic, and thus applicable, in principle at least, only in large or very large samples. It is however possible to make use of bootstrap techniques in order to obtain greater reliability of inference in finite samples. Depending on interest and the time available, I will take up some topics in the application of the bootstrap in the context of income data, for which some new methods have been developed in order to overcome difficulties encountered when conventional bootstrap techniques are used.