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Scaling of ensemble fluctuation and Pareto laws in the distributions of average property prices per block in Bogotá

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An econophysical study of datasets on cadastral and commercial values of average prices per property per block in Bogotá leads us to identify the existence of ensemble fluctuation scaling. This scaling, which is a property of complex systems observed in a variety of natural scenarios and is characterized by a power-law relationship between the variance and the mean of the data, is found for the first time in data on average urban property prices. Furthermore, we find that the scaling of ensemble fluctuations exhibit spatial scale invariance when considering average property prices per block at the following spatial scales: blocks, neighborhoods, zoning planning units, and localities. Finally, for low and medium average price values, we find that the probability distribution fits a lognormal distribution, while the distribution above a certain price threshold follows a Pareto law for heavy tails.

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