

## Seminario Aleatorio

*Sesión 386*

### The Difference-in-Variance Test for Asymmetry

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#### Abstract

Applied statistics use intensively mean (centrality or location) and variance (dispersion or spread) of probability distributions, but less so higher moments referring to their shape. Skewness or lack of symmetry in a probability distribution is a salient property that may uncover relevant insights in fields such as finance, where it informs on investors' preference for positive yields. We propose a simple asymmetry test comparing the variance estimators from realisations on either side of the mean. We prove that both variance estimates are equal asymptotically for symmetric distributions, and we construct a test for asymmetry based on this equality. The test statistic is normally distributed under the null hypothesis and is consistent since it diverges to infinity under the alternative. Monte Carlo simulations show that the proposed test displays a better level-power trade-off in finite samples than classical tests for asymmetry. Moreover, our test circumvents the computation of the third moment and is robust to outliers and heteroskedasticity. A brief empirical application is presented using financial data.

**Viernes 13 de mayo de 2022,  
13:00 hora de CDMX,**

<https://itam.zoom.us/j/99656602458?pwd=MHdiVVhQcVVwbHNTM0xxeW1JZ2ppZz09>

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