Statistic - not in the real word - not normally distributed

-in theory it is normally distributed , but in reality it is more cauchy distributed -  no moment (different level of integration)

empirical distribution - based on your direct observation of the outcomes, it is based on real data

theoretical distribution - based on the distribution and the parameters ( normal, cauchy  )

-the first moment is always the mean, the second moment is always the variance

-cauchy distribution - no moment, when you calculate the mean, variance, you will get the number but it has no meaning

-under cauchy distribution, very high and small arithmetic number can exist, that is why it is bad to use mean to estimate, so we need to use median instead.

-under cauchy distribution, data is distributed like T distribution when df is 0

normal distribution - etc. human height

two-key - more in real life

cauchy distribution- etc. stock market

-normal and cauchy exist in reality, but not often because they are like the two extreme on the spectrum

-choose the estimator, consider two thing- variance, bias (not so much bias in this class)

-when selecting the estimator( trim number # , choose the lowest or smallest variance(standard deviation) because it is the most precise estimator of the central tendency of the data

-why some estimator have different variance,

-Table, delimma it is that if we don’t know how the data is distributed, we can choose trim which is 2nd best

mean is best for symmetric distributions without outliers

median is useful for skewed distributions or data with outliers

         Mean            Median        Trimmed estimator

Cauchy Horrible           Best                2nd best

Normal                     Best                Bad        2nd best

if we are in a scenario that whether the distribution is cauchy  or normal,

`when the variance is big then suddenly jump into very small number, we assume it is not normally distributed(maybe cauchy but we are not certain about that)

`when the variance is basically the same and small, we say it is probably normally distributed

`when under cauchy, the standard deviation of mean might be over 50 and variance is very large etc, 3000

Go to wiki - learn about econometrics definition

in the class, much more about conceptual definition and intuitive learning