Twitter Thread by Subhadip Nandy



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IV - A thread

In financial mathematics, implied volatility of an option contract is that value of the volatility of the underlying instrument which, when input in an option pricing model) will return a theoretical value equal to the current market price of the option (1/n)

Implied volatility, a forward-looking and subjective measure, differs from historical volatility because the latter is calculated from known past returns of a security. .
https://t.co/iC5wVf7kvj (2/n)

To understand where Implied Volatility stands in terms of the underlying, implied volatility rank is used to understand its implied volatility from a one year high and low IV.
https://t.co/NFPOidRRcH

https://t.co/qNqinEqaKY

(3/n)

Options traders are always looking at the IV and IVR/IVP. For option buyers, a low IV environment is best to initiate positions as the subsequent rise in IV actually helps their positions . Even if the IV remains flat, the position is not hurt by volatility (4/n)

Option sellers on the other hand are looking for high IV scenarios, where the subsequent fall in IV (known a vol crush , most often seen after earnings/events) helps their positions. Here also, if the IV does not rise, it does not hurt a seller's positions (5/n)

IVR and IVP help both parties to understand where the IV is standing relative to the last one year OR six months. Based upon IVR/IVP , these

parties initiate their respective strategies. (6/n)

IV Rank and IV Percentile

IV Rank is a description of where the current IV lies in comparison to its yearly high and low IV.

IV Percentile tells the percentage of days over the past year, that were below the current IV.

S&P 500 IV Rank	14%
S&P 500 IV Percentile	64%

Now we come to the problem which I have faced in using IVR/IVP. See the attached chart of SBI with IV (chart taken from https://t.co/uqGUOSVFb5).



The recap day lead to a huge spike in IV. As a result the IVR post the movevnent will be skewed for the next 6 months. Even a normally high IV (historically) will have a low IVR due to this spike, which basically is an outlier (7/n)

Post the 6 month or 1 year timeframe used to calculate the IVR, the day in which that spike day goes out of calculation, the whole IVR scenario changes. What was a high IV environment can become a very low IV environment in a single day (due to dropping off that spike data)

One can argue that one can drop of the spike day IV value and thus check the IVR. But what distinguishes an outlier ? Is there any objective measure which takes care of this ?

Is there a way in which from the very next day of the spike, I can statistically determine high or low IV keeping the high spike day in consideration ?

Using Data Science : The #BoxPlot (10/n)

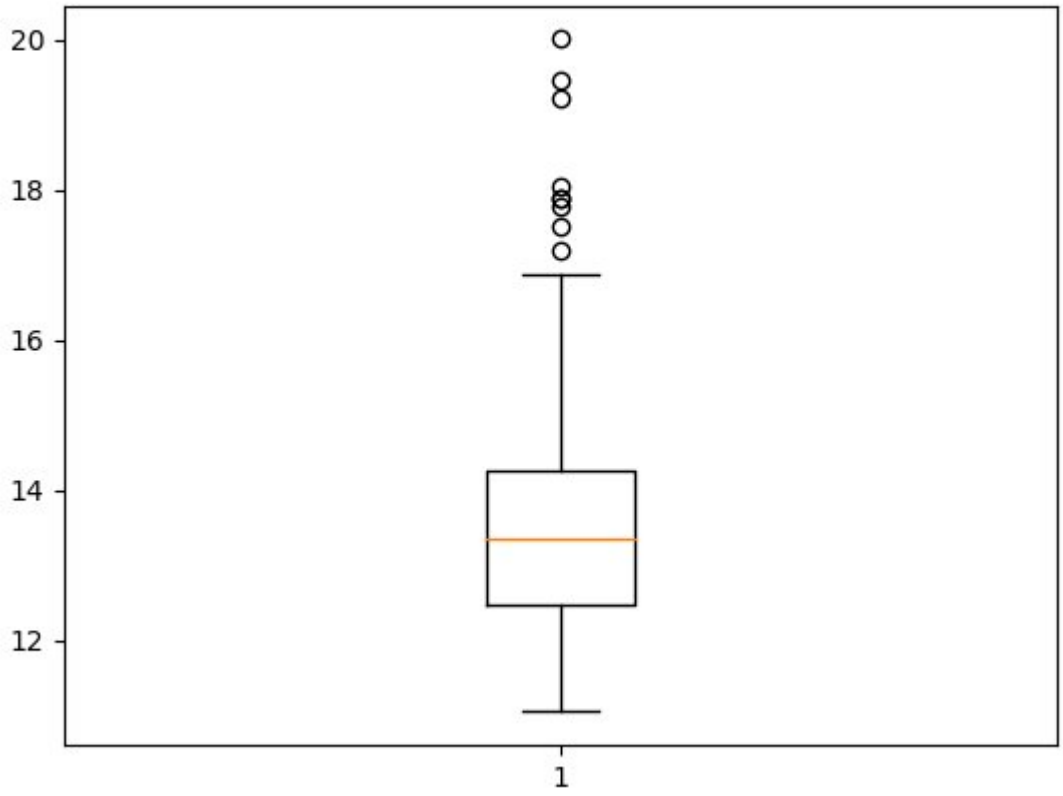
In descriptive statistics, a #BoxPlot is a method for graphically depicting groups of numerical data through their quartiles. #BoxPlot may also have lines extending vertically from the boxes (whiskers) indicating variability outside the upper and lower quartiles,

hence the terms box-and-whisker plot and box-and-whisker diagram. Outliers may be plotted as individual points. #BoxPlot are non-parametric: they display variation in samples of a statistical population without making any assumptions of the underlying statistical distribution.

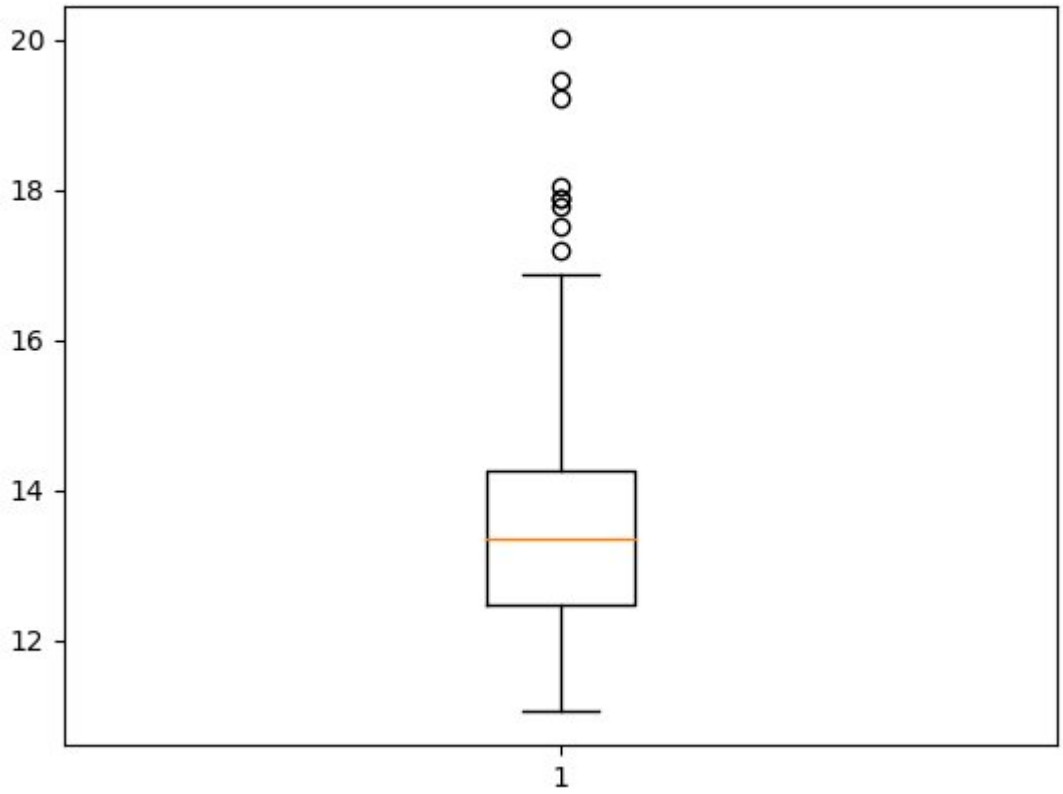
The spacings between the different parts of the box indicate the degree of dispersion (spread) and skewness in the data, and show outliers.

https://t.co/O536rZS0AE (12/n)

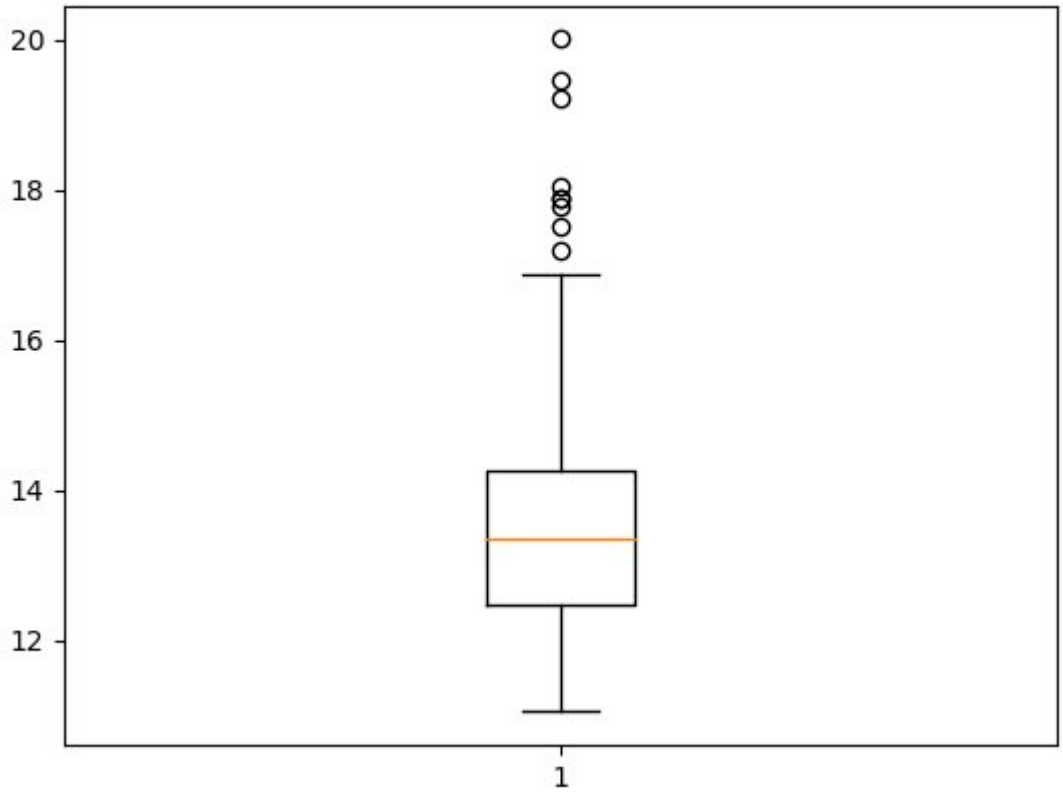
See the picture below for a simple explantion. This is a #BoxPlot of NSE VIX , uses data of the last one year. What this #BoxPlot says is :



1. The red line is the median value, with 50% of all observations above and 50% below
2. VIX above 17 is wild wild west where anything can happen, both buyers and sellers should be very very careful (13/n)



3. The lowest quartile 12.5 and below. Sellers will be at a disadvantage in initiating their strategies here. This is options buy strategies market
4. The topmost quartile 14.5-17 is where one can initiate selling strategies, buying strategies obviously will be at a disadvantage



This explanation will vary in individual stocks (different IV regime), but we will get statistically valid zones to determine what kind of strategies should we deploy. Infinitely more rpeferable than flying blind. And the #BoxPlot solves the IV spike problem (15/n)

A link to understand the maths behind how the box plot is created and how to interpret : https://t.co/e3PsZvMt0X (16/n)

No normal charting software has the facility to create BoxPlot charts. This chart has been generated using python. My next project is forecasting volatility and how IV moves between the different quartiles of a #BoxPlot
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Bouquets and brickbats welcome ■ @VohiCapital @KatariyaPran @alkd1976 @Raghunath_TL @iamvishchauhan @shubham_quant @Tinagadodia