

A Simple Visualization of S & P 500 Index Performance

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1. Representing self, this work has no affiliation to author's employer, Agilent Technologies Inc.

2. Abstract submitted for Poster session in area of Visualization & Graphics

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The historic performance of the Standard and Poors 500 (S&P Index) is calculated and represented visually using a simple algorithm implemented in R. The graph allows a casual observer to compare the index, on any chosen date, to the historical index performance. Information on over, under-performing the Index is easily seen.

Boxplot parameters such as range, min, max, mean, median and quantile points are calculated for each index value for various time intervals such as 30 days, 90 days, 1, 2, 3, 5 years, and so on. Box plot parameters are normalized by the range and plotted on a polar plot, with each unit radii representing one time interval. Calculating these same changes for any one index point, and plotting on the graph allows a visual comparison.

Algorithm in pseudo code

Start with a dataset of the S&P Index from 1/3/1950 in descending chronological order
`Index[] = read.table(S&P Index csv data file)`

Create the visual plot of the S&P Index

for each **interval** in {30 day, 90 day, ..., 5 year} repeat the following

Calculating the historical performance data

for each **day** in SandP Index, repeat the following

$change[day] = (Index[day] - Index[day - interval]) / interval$

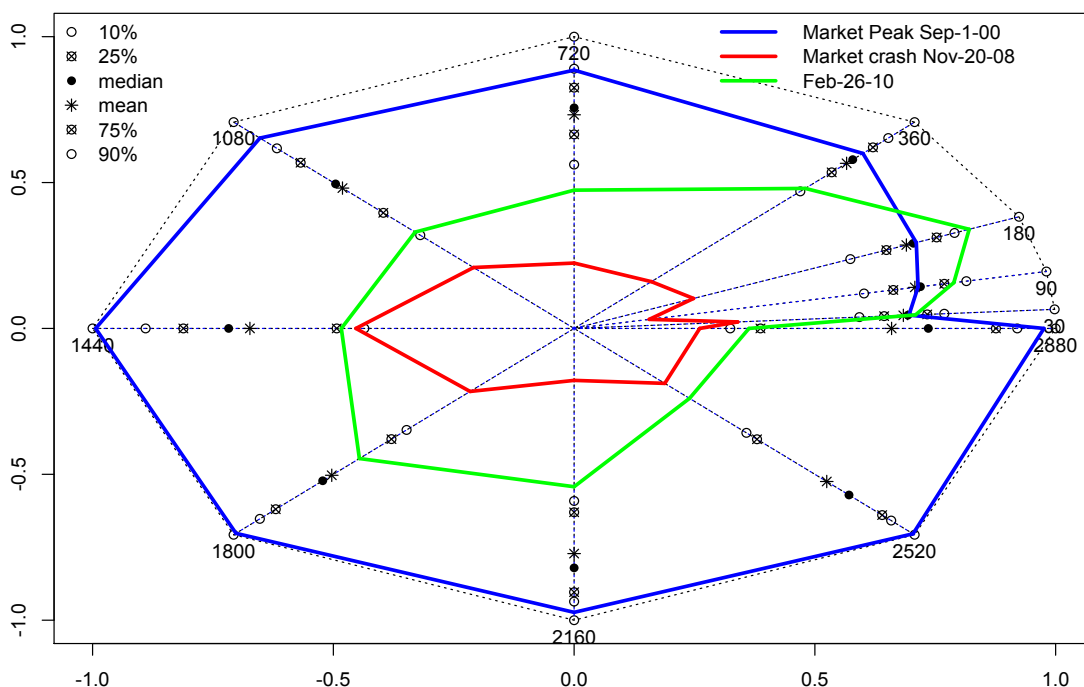
calculate $mean(change[])$ repeat for $quantile(0, .1, .25, .5, .75, .9, 1)$

Creating the polar plot

normalize each parameter, for eg: $mean/range$, $median/range$, etc.

plot normalized parameters along radius at $360 * interval / max(interval)$

A Visualization of S&P 500 - from 1950 to present



References

Peter Dalgaard (2008). Introductory Statistics with R, Springer, 2nd edition, August 2008.

Yahoo Inc. (2010). S&P Index Data available at Yahoo Finance Website, <http://finance.yahoo.com/>

Note from author to reviewers:

R was well suited to crunching the S&P Index dataset (a large 800KB ascii text file). It had the graphics functionality to create polar plots from basic elements. The actual R program is relatively small, and no special library functions outside what's loaded by default in R 2.10.1 were used.

I started learning R in December 2009, this work was a simple project towards testing my progress.

I intend to use this graph to gauge if recent Index performance is approaching outliers of historical performance.