R in Finance Conference - Chicago
May 2016

Measuring Income Statement Sharpe Ratios using R
Mark J. Bennett
mjbennett@uchicago.edu

# The American football Passing Effiency Ratio provides an analytical measurement of the success of the quarterback

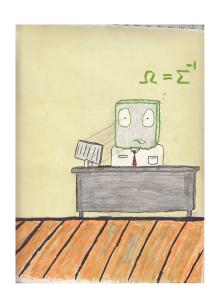
$$PssrRtg_{NCAA} = \\ \underline{(8.4 \times Yds) + (330 \times TDs) + (100 \times Compl) - (200 \times Intcps)}_{Atmps}$$

- While Aaron Rogers was a quarterback in college, playing for the University of California at Berkeley ("Cal"), he played two seasons
  - ▶ 5,469 total passing yards
  - 424 completions
  - ▶ 665 attempts
  - only 13 interceptions
  - ▶ a hefty 43 touchdown passes
- ► This yielded, according to our formula above, to a Cal record career passer rating of 150.2 and high QB NFL draft pick



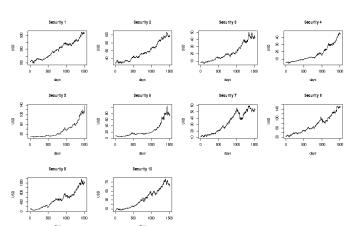
### What is one of the most important Financial Ratios?

- "Sure returns are important"
- "But what about volatility?"
- "Consistency is the key in sports..."
- ▶ "... and finance"

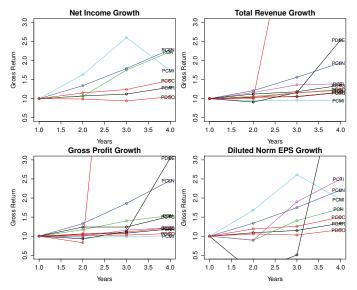


The Sharpe Ratio (SR) is well known analytical metric to compare securities. It rewards good Financial Returns and it penalizes Irratic Behavior of those returns.

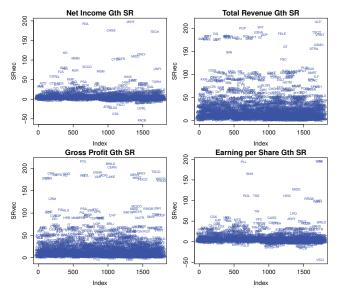
$$r_{S} = \frac{E\left\{R_{P}\right\} - \mu_{f}}{\sigma_{P}}$$



# Income statement figures for thousands of stock tickers can be read via R program using *quantmod* package



## The Income Statement Sharpe Ratio (ISSR) can be computed like Sharpe Ratio of log returns of price history



#### The 4 ISSRs can be sorted and we can 'cherry pick' best

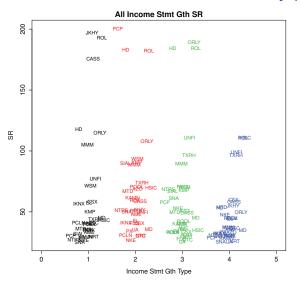
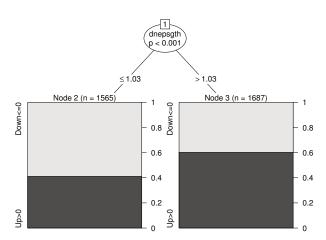


Figure: 33 candidates & ISSRs 1=Income Growth, Net;2=Total Rev Growth; 3=Gross Profit Growth;4=Diluted Norm Earn per Share Growth

The 4 IS RVs can be used as predictors of Up/Down price behavior for Long/Short positions with 61% accuracy using the *party* decision tree package in R



### Financial Analytics with R: Building a Laptop Laboratory for Data Science

- ► From Cambridge University Press in Fall 2016
- For professionals and students seeking financial analytics training in data science.
- Business, investor, and consumer-level problems are attacked with tools from statistics, computer science and finance.
- Thousand of lines of operational R code are included to help the reader build their "Laptop Laboratory"

