BASEBALL BY THE NUMBERS

a Brownbag Presentation

by John Aleshunas

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Baseball is like a church, many attend but few understand.

Wes Westrum

Outline

- Data use example
- Sabermetrics
- Data sources
- Tools
- Resources
- Further analysis examples

Geek Warning

- This presentation is for folks who want to get data, crunch data and analyze data.
- If you want to view the highlights, please watch SportsCenter on ESPN.

Relax

The presentation PowerPoint slides and all of the presentation references can be found at:

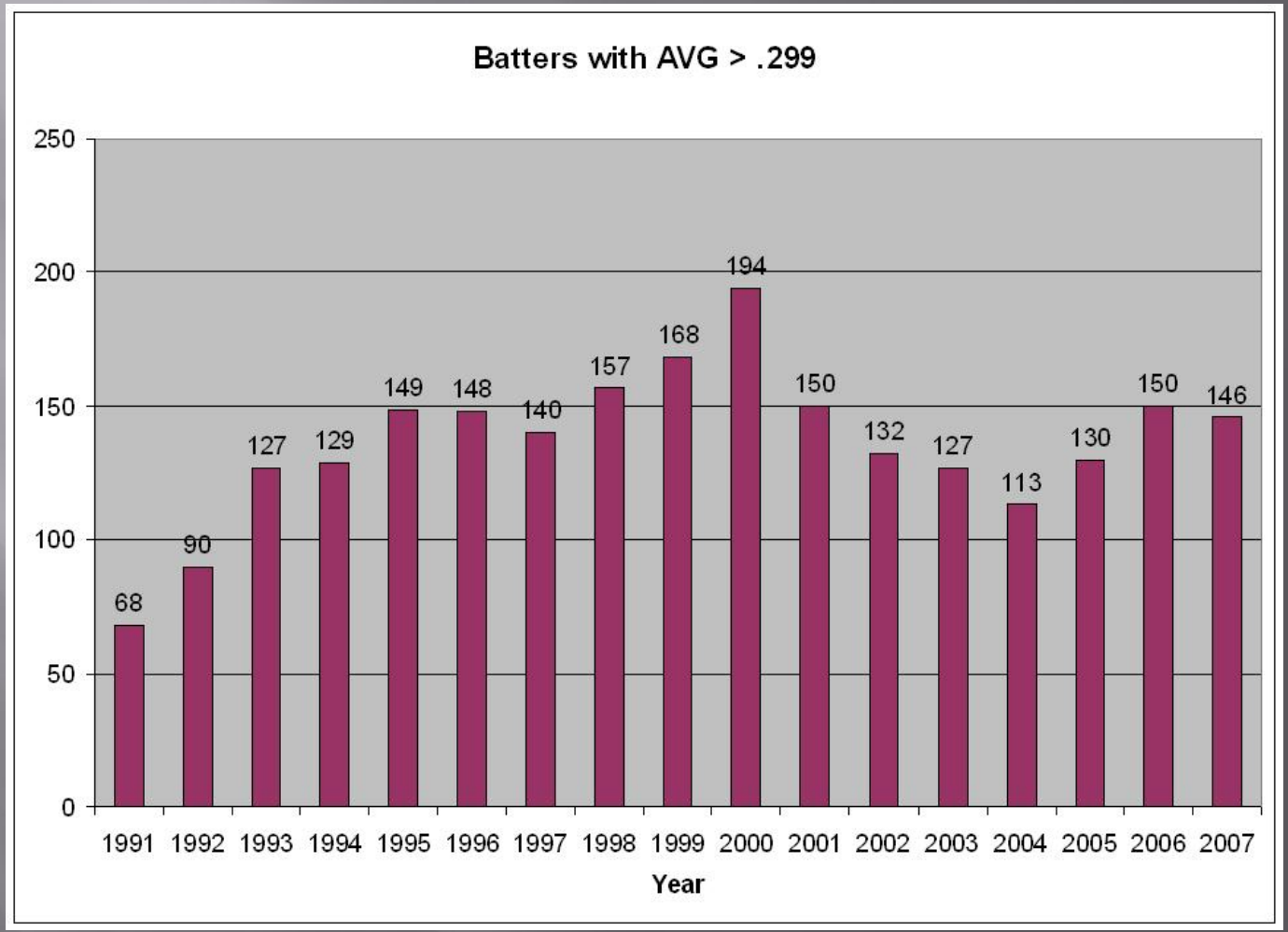
http://mercury.webster.edu/aleshunas

Batters vs. Pitchers

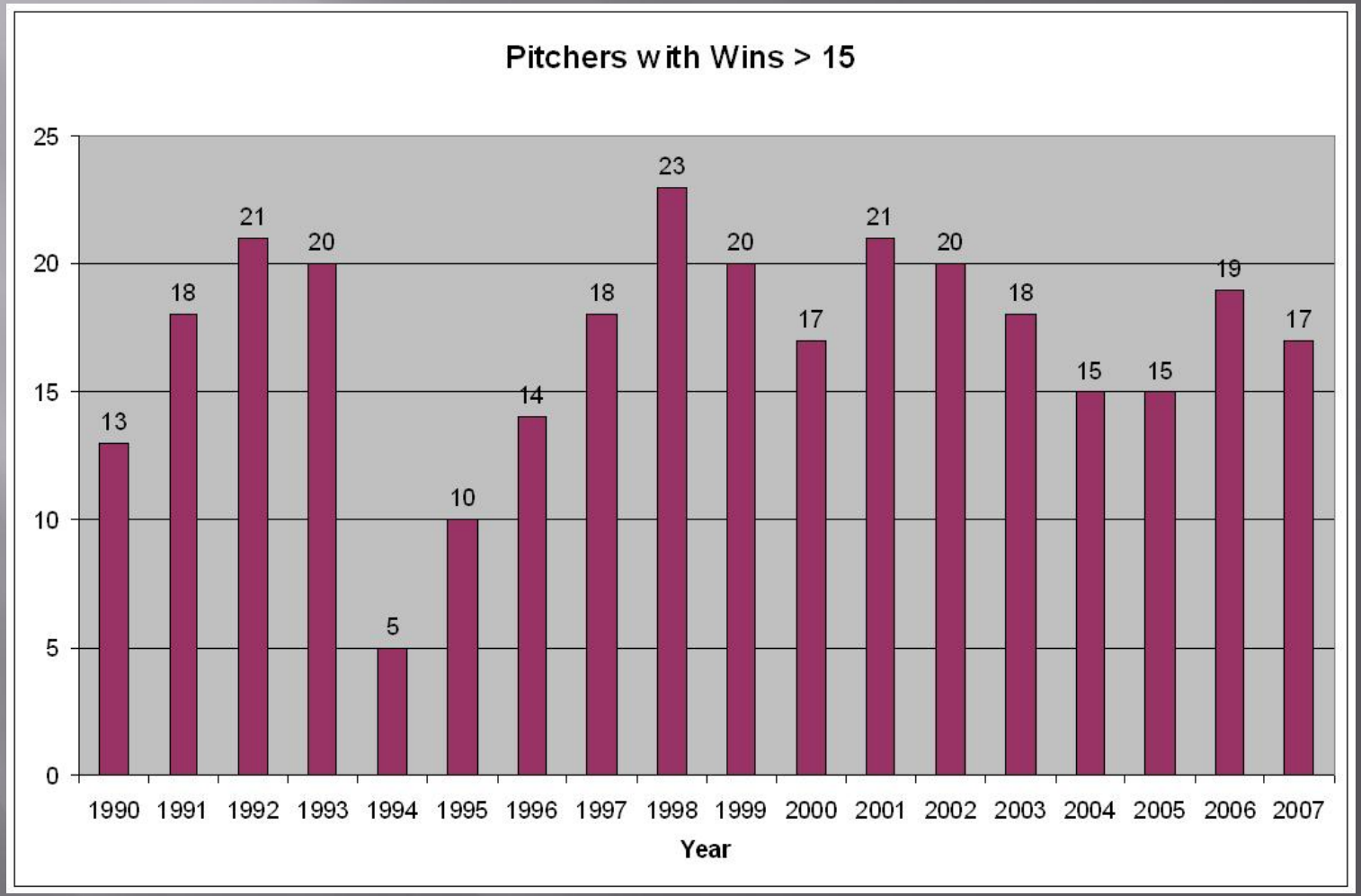
It's been going on in baseball for 100 years. When pitchers make quality pitches, batters do not make good contact.

Tony La Russa

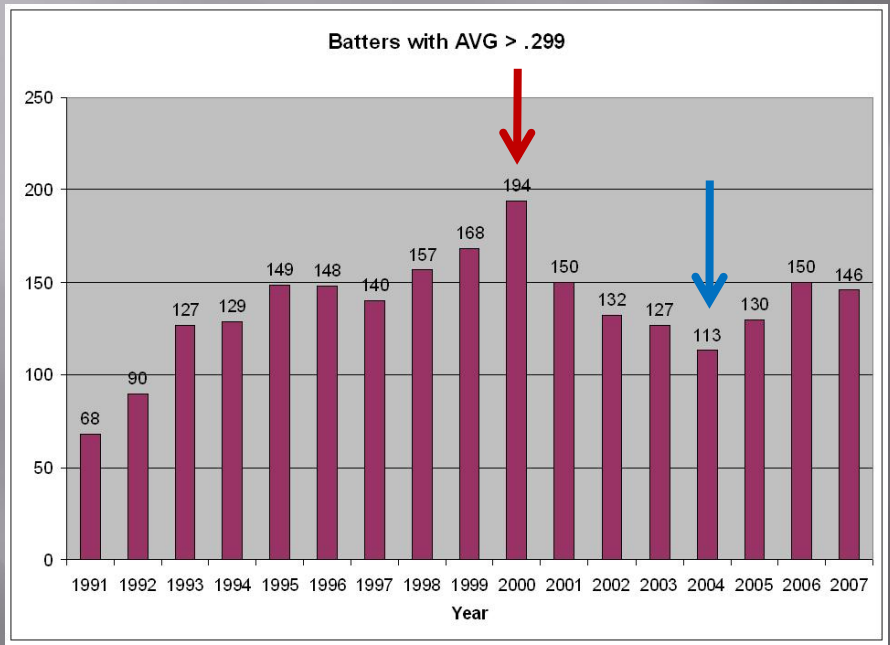
Batter Analysis

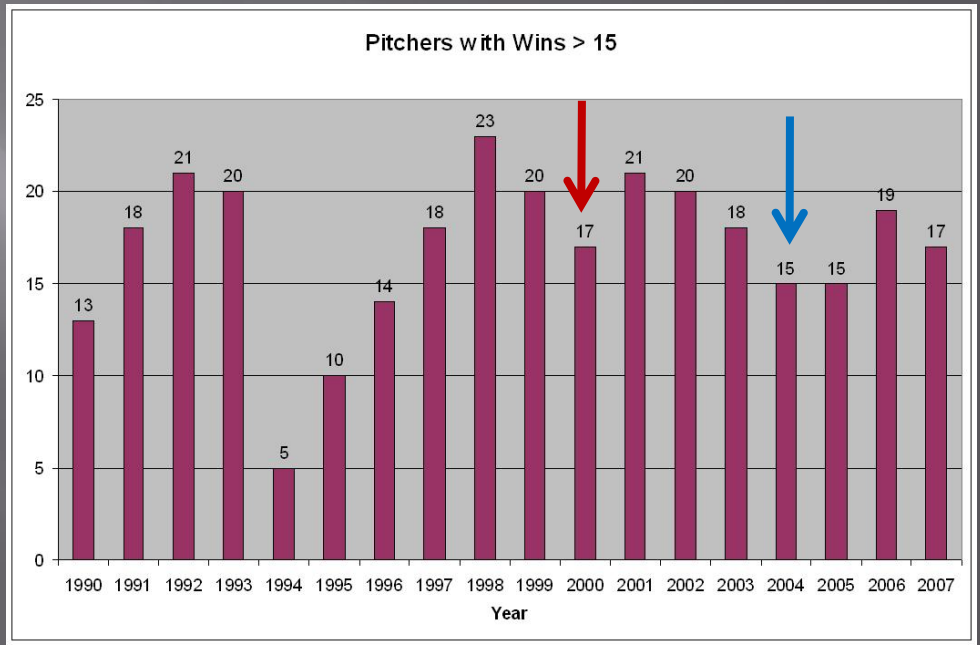


Pitcher Analysis



Batters vs. Pitchers





Bill James

George William "Bill" James (born October 5, 1949, in Holton, Kansas) is a baseball writer, historian, and statistician whose work has been widely influential. Since 1977, James has written more than two dozen books devoted to baseball history and statistics. His approach, which he termed sabermetrics in reference to the Society for American Baseball Research (SABR), scientifically analyzes and studies baseball, often through the use of statistical data, in an attempt to determine why teams win and lose. In 2006, Time magazine named him in the Time 100 as one of the most influential people in the world.

http://en.wikipedia.org/wiki/Bill_James

SABR

- Society for American Baseball Research

- The Society for American Baseball Research (**SABR**) was established in Cooperstown, New York in August, 1971. Their mission is to foster the study of baseball past and present, and to provide an outlet for educational, historical and research information about the game.

- http://www.sabr.org/

Data Sources (pay)

- The Baseball Cube
- Baseball Info Solutions
- Baseball Prospectus
- Baseball Reference

- All of these sources offer good service, for a fee

Data sources (free)

- Society for American Baseball Research (SABR)
- Lahman database
- Retrosheet
- Baseball Index
- The Official MLB Website

- These are good low-cost data sources

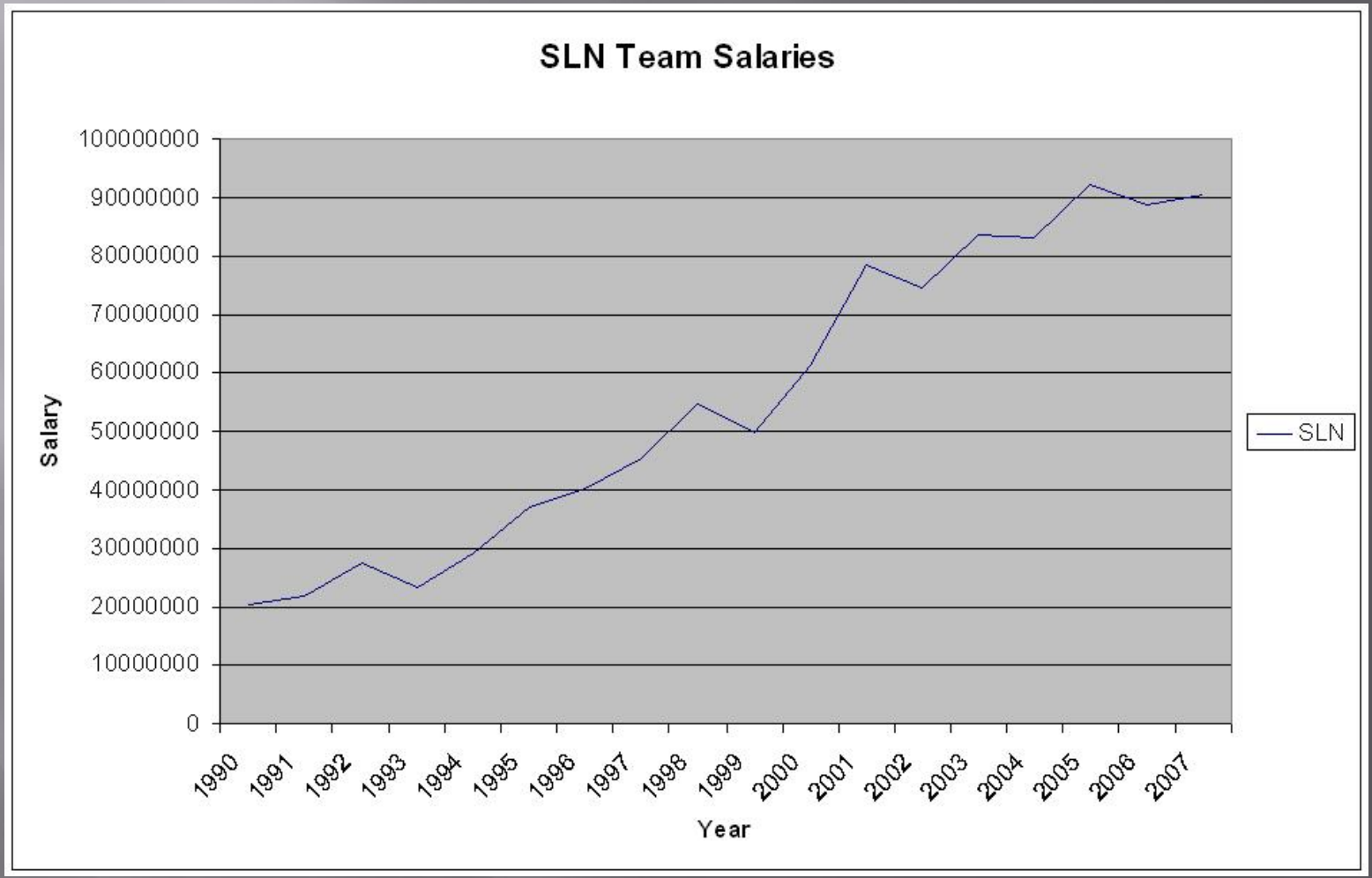
Lahman Database

- Compiled annual data for batters, fielders, pitchers, managers and teams
- Covers all major league baseball from 1870 to present (current to 2007)
- MS Access DB - http://www.baseball1.com/
- MySQL DB - http://www.baseball-databank.org/

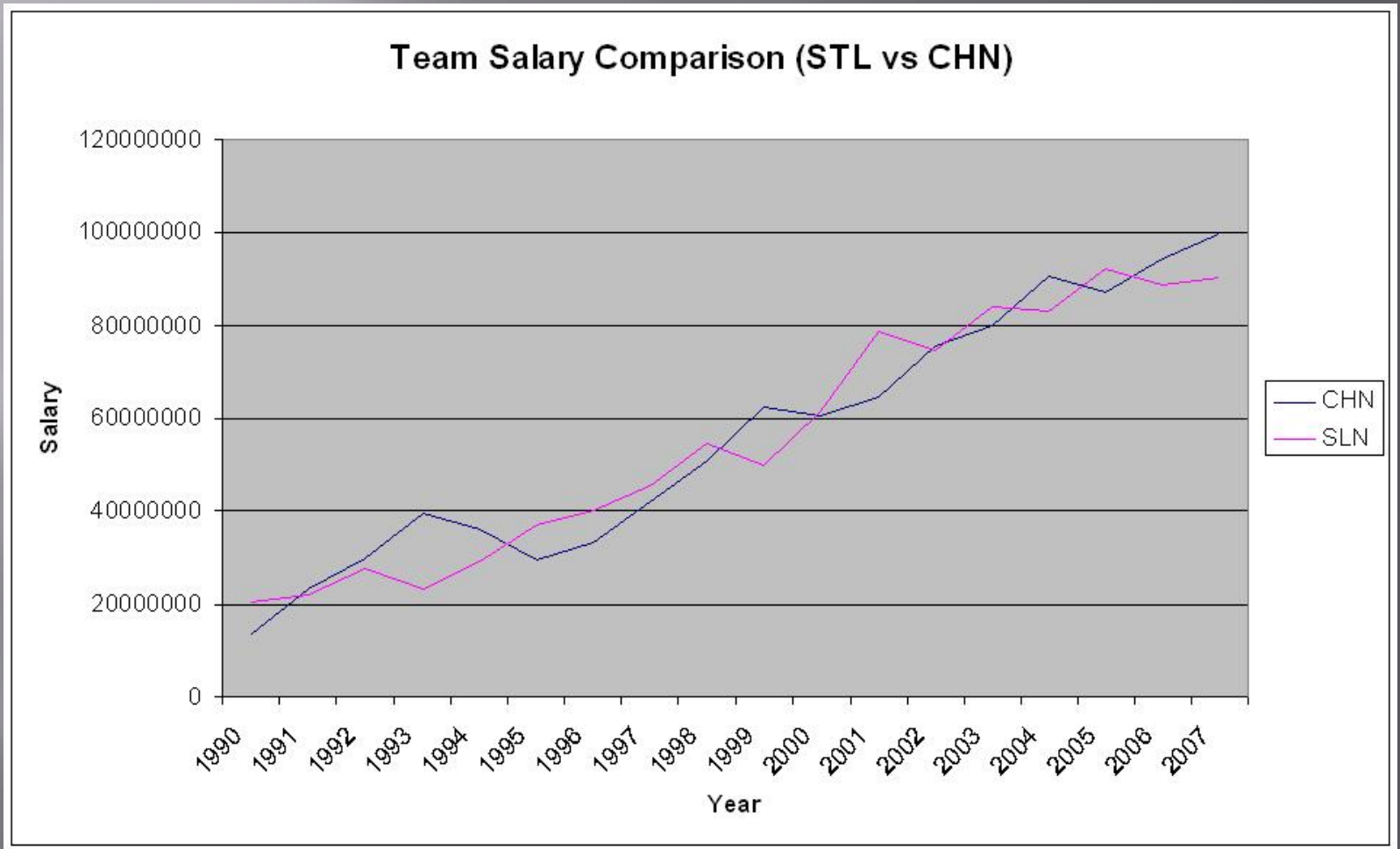
Retrosheet Data

- Retrosheet is a non-profit corporation, incorporated in the State of Delaware in 1994.
- Retrosheet's work has three distinct aspects.
  - First is the collection of the game accounts, which have been obtained from several sources.
  - The second activity is the translation of these accounts to a unified, modern system which is essential since there are an extraordinary variety of scoring systems which have been used.
  - The final activity is the entry of the translated accounts into the computer.
- The first meeting of Retrosheet, Inc. was held in Arlington, TX on June 17, 1994.

Salary Analysis



Salary Analysis (STL vs. CHC)



Data Manipulation & Analysis Tools (pay)

- Microsoft Office
  - Excel (spreadsheet)
  - Access (database)
- SPSS, SAS (statistical analysis software)
- Oracle (database) *

Microsoft Excel & Access

- Familiar
- Established applications
- Reference materials
- User generated files
- Cost: $500 (retail – MS Office Professional)

SPSS

- GUI based statistical software
- Industry leader
- http://www.spss.com/
- Cost: $639 (Base – Higher Ed, $1699 Commercial)

Data Manipulation & Analysis Tools (free)

- Open Office
  - Calc (spreadsheet)
  - Base (database)
- R, Octave, Sage (statistical and mathematical analysis)
- MySQL (database)
- Perl (programming language)

Open Office Calc & Base

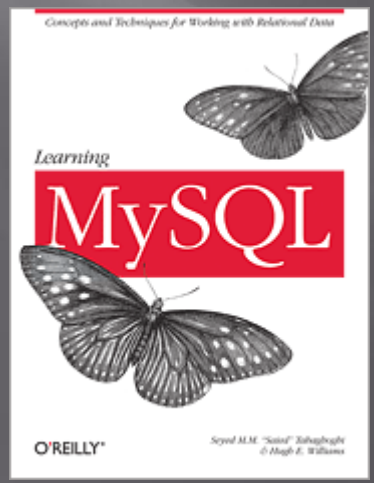
- OpenOffice.org is a multiplatform and multilingual office suite and an open-source project
- Compatible with all other major office suites
- The product is free to download, use, and distribute
- http://www.openoffice.org/

R, Octave & Sage

- R is a free software environment for statistical computing and graphics
- GNU Octave is a high-level language, primarily intended for numerical computations
  - It is mostly compatible with Matlab
  - It is also freely redistributable software
- SAGE is a viable free open source alternative to Magma, Maple, Mathematica, and Matlab

MySQL Database

- The world's most popular open source database (free for personal use)
- http://www.mysql.com/
- Learning MySQL by Seyed Tahaghoghi & Hugh Williams



http://www.oreilly.com/

PERL Language

- Programming PERL by Larry Wall, Tom Christiansen & Jon Orwant

http://www.oreilly.com/

Manager Career Winning

- Which MLB manager has the most career wins?
- We'll use the Lahman database on MySQL

Salary Analysis - revisited

- Let's redo the team salary analysis to show the steps in developing the chart
- We'll add Houston to the mix, just to add additional interest

Retrosheet Download and Processing

- Let's download a file from Retrosheet and process it.
  - Download
  - Bevent processing
  - Opening in a spreadsheet
  - Loading into MySQL

Double Play Analysis

- Which MLB batter hit into the most double plays in 2007?
- We'll use Retrosheet data, again on MySQL

Intentional Walk Analysis

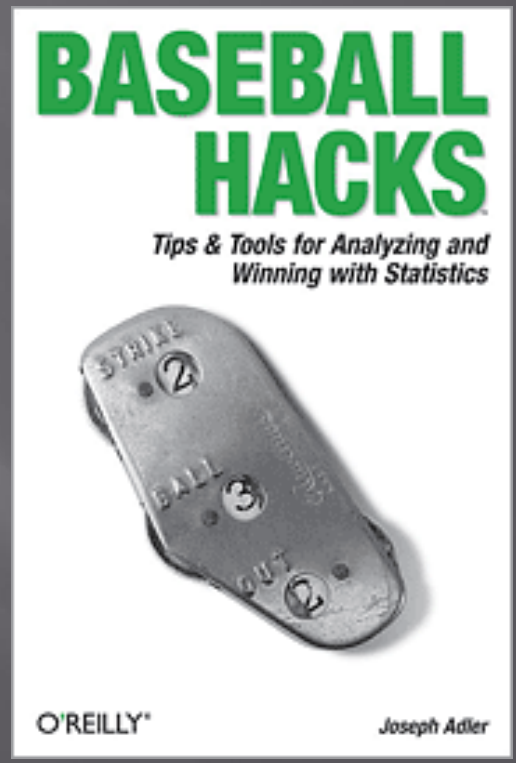
- The goal, in baseball, is to score more runs than your opponent
- You score runs by putting runners on base
- Therefore it seems counter-intuitive for the defense to put a runner on base
- Reasons for an intentional walk
  - Avoid a dangerous hitter
  - Set up a double play situation

Intentional Walk Analysis

- In 2006 NL play, 37.6% of IWs were followed by a run scored
- An average NL batter had a .272 BA (>149 AB)
- The best batter had a .344 BA
- A hit resulted in a run 53.2%
- Advantage = P(hit) * P(run)
  - Average hitter = (.272)*(.532) = 0.145
  - Best hitter = (.344)*(.532) = .183
  - Intentional walk = (1.000)*(.376) = 0.376

Further Reading

Baseball Hacks by Joseph Alder



http://www.oreilly.com/

Summary

- Data use example
- Sabermetrics
- Data sources
- Tools
- Resources
- Further analysis examples

You know how to pitch God?

Hard stuff inside, then down and away, and if you get it there you'll get Him out. Even though He'll know it's coming. Or at least they say He knows.

Jim Lefebvre

References

Will, George (1990), Men at Work the Craft of Baseball, New York, Macmillan Publishing Company

Bill James Article, http://en.wikipedia.org/wiki/Bill_James

My Web Site, http://mercury.webster.edu/aleshunas