Football I

What Makes Teams Win

YDS = Yards
ATT = Attempt

❖ **Two Ways Offense Gains Yards**
   ❖ **Passing**
   ❖ **Rushing**

❖ **Analysis by Bud Goode**
   ❖ **Statistician from the 1960s**
   ❖ **Passing YDS and Rushing YDS Not Effective**
   ❖ **Showed YDS/ATT Good Predictors of Success**
   ❖ **Measures of Efficiency are Better Than Counts**
   ❖ **Both Passing and Rushing Attempts Use Up a Down**
   ❖ **Downs in Football are Important Resources**

What Makes Teams Win

- ❖ **Scoring Margin for a Team**
  - ❖ **Often Called the Spread**
  - ❖ **Formula**

  $$Spread = PTS\ For - PTS\ Against$$

  - ❖ **Positive Spread = Team Won**
  - ❖ **Negative Spread = Team Lost**

- ❖ **Offensive Predictors of Spread**
  - ❖ **Passing YDS/ATT**
  - ❖ **Rushing YDS/ATT**
  - ❖ **TOs Committed**

PTS = Points
YDS = Yards
ATT = Attempt
TO = Turnover

What Makes Teams Win

❖ **Defensive Predictors of Spread**
  ❖ **Passing YDS/ATT Allowed**
  ❖ **Rushing YDS/ATT Allowed**
  ❖ **Defensive TOs Caused**

❖ **Differential Predictors of Spread**
  ❖ **Difference Between PEN**
  ❖ **Difference Between Return TDs (Off Fumbles, Interceptions, Kickoffs, and Punts)**

YDS = Yards
ATT = Attempts
TO = Turnover
PEN = Penalty
TD = Touchdown

What Makes Teams Win

❖ **Regression on the Team Level**
- ❖ **Covers 2003 – 2006 Seasons**
- ❖ **All Predictors are Significant Except the Intercept**
- ❖ **RSQ of 0.87**
- ❖ **Standard Error of 35**
- ❖ **Approximately 95% of the Time, the True Scoring Margin Would Be Within 70 Points**

❖ **Interesting Insight**
- ❖ **Coefficients for Passing Efficiency Triple Coefficients for Defensive Efficiency**
- ❖ **Extra Passing YDS/ATT Worth 61.67 PTS (+3.85 PTS/G)**
- ❖ **Extra Rushing YDS/ATT Worth 26.44 PTS (+1.65 PTS/G)**
- ❖ **What is the Problem with This Interpretation?**

PTS = Points
YDS = Yards
ATT = Attempts
G = Games

Based on 16 Game Season

What Makes Teams Win

TO = Turnover

❖ **Modified Regressions for Spread**
  ❖ **Regression Based ONLY on Passing Info (RSQ = 0.7)**
  ❖ **Regression Based ONLY on Defensive Info (RSQ = 0.06)**

❖ **Impact of Turnovers**
  ❖ **Offensive TOs Worth 3.7 Points**
  ❖ **Defensive TOs Worth 3.4 Points**
  ❖ **Overall, TO Worth Approximately 3.55 Points**

What Makes Teams Win

❖ **Correlation Matrix of Predictors**

	Returned for TD	Penalty Differential	OFF Pass Yds. per Att.	OFF Rush Yds. per Att.	OFF Turnovers	DEF Pass Yds. per Att.	DEF Rush Yds. per Att.	DEF Turnovers
Returned for TD	1	−0.10949	0.07646	0.15469	−0.31181	−0.21578	−0.08204	0.37086
Penalty Differential	−0.10949	1	−0.17464	−0.03113	0.13023	0.06286	−0.1739	−0.10505
OFF Pass Yds. per Att.	0.07646	−0.17464	1	0.0999	−0.44827	0.01083	0.17965	0.15363
OFF Rush Yds. per Att.	0.15469	−0.03113	0.0999	1	−0.31013	0.06501	0.09502	−0.03066
OFF Turnovers	−0.31181	0.13023	−0.44827	−0.31013	1	−0.02521	−0.09825	−0.13314
DEF Pass Yds. per Att.	−0.21578	0.06286	0.01083	0.06501	−0.02521	1	0.2759	−0.29984
DEF Rush Yds. per Att.	−0.08204	−0.1739	0.17965	0.09502	−0.09825	0.2759	1	−0.14402
DEF Turnovers	0.37086	−0.10505	0.15363	−0.03066	−0.13314	−0.29984	−0.14402	1

What Makes Teams Win

❖**Relationship Between Passing and Rushing Stats**
- ❖**Correlation of 0.10 Between Passing YDS/ATT and Rushing YDS/ATT**
- ❖**Many Believe Rushing Improves the Passing**
- ❖**Contradicts the Actual Seasonal Data**
- ❖**Why Low Correlation? Possibly Due to Payroll Decisions**

YDS = Yards
ATT = Attempt

Final Inspiration

If you don't remember if you played football, you probably played football.

- Mahatma Mario