Football I

Produced by Dr. Mario | UNC STOR 538

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 a Down**
  ❖ **Downs in Football are Important Resources**

What Makes Teams Win

❖ **Scoring Margin for a Team**
  ❖ **Related to the Spread**
  ❖ **Formula**

  $$Scoring\ Margin = PTS\ For\ - PTS\ Against$$

  ❖ **Positive Margin = Team Won**
  ❖ **Negative Margin = Team Lost**

❖ **Offensive Predictors of the Scoring Margin**
  ❖ **Passing YDS/ATT**
  ❖ **Rushing YDS/ATT**
  ❖ **TOs Committed**

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

What Makes Teams Win

❖ **Defensive Predictors of the Scoring Margin**
  - ❖ **Passing YDS/ATT Allowed**
  - ❖ **Rushing YDS/ATT Allowed**
  - ❖ **Defensive TOs Caused**

❖ **Differential Predictors of the Scoring Margin**
  - ❖ **Difference Between PEN**
  - ❖ **Difference Between Return TDs (Off Fumbles, Interceptions, Kickoffs, and Punts)**

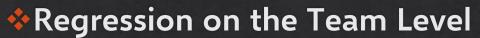YDS = Yards
ATT = Attempts
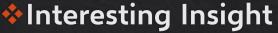TO = Turnover
PEN = Penalty
TD = Touchdown

What Makes Teams Win

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

❖ **Regression on the Team Level**
  ❖ **Covers 2014 – 2017 Seasons**
  ❖ **All Predictors are Significant Except Penalty Difference**
  ❖ **RSQ of 0.79**
  ❖ **Standard Error of 44**
  ❖ **Approximately 95% of the Time, the True Scoring Margin Would Be Within 88 Points**

❖ **Interesting Insight**
  ❖ **Coefficients for Passing Efficiency Triple Coefficients for Defensive Efficiency**
  ❖ **Extra Passing YDS/ATT Worth 69.04 PTS (+4.3 PTS/G)**
  ❖ **Extra Rushing YDS/ATT Worth 23.24PTS (+1.45 PTS/G)**
  ❖ **What is the Problem with This Interpretation?**

Based on 16 Game Season

❖ **Correlation Matrix of Predictors**

	RET TD	PENDIF	PY/A	RY/A	TO	DPY/A	DRY/A	DTO
RET TD	1							
PENDIF	−0.0411544	1						
PY/A	0.11048133	−0.0159983	1					
RY/A	−0.0576343	0.14013158	0.117779	1				
TO	−0.0812525	0.00623663	−0.3247161	−0.1171398	1			
DPY/A	−0.231602	−0.0861299	−0.0057858	0.04259182	0.24926699	1		
DRY/A	0.01902488	−0.220135	0.22861	−0.0454787	−0.2443873	0.23895137	1	
DTO	0.20411428	−0.0429489	0.11200158	−0.1535111	−0.0576773	−0.1431152	0.14203155	1

What Makes Teams Win

TO = Turnover

❖ **Modified Regressions for Scoring Margin**
  ❖ Regression Based ONLY on Passing Info (RSQ = 0.63)
  ❖ Regression Based ONLY on Rushing Info (RSQ = 0.17)

❖ **Impact of Turnovers**
  ❖ Offensive TOs Costs 4.99 Points
  ❖ Defensive TOs Worth 2.01 Points
  ❖ Overall, TO Worth Approximately 3.5 Points

What Makes Teams Win

❖ **Relationship Between Passing and Rushing Stats**
   ❖ **Correlation of 0.12 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