Football II

Produced by Dr. Mario | UNC STOR 538

Importance of the Quarterback

- ❖ **Historically Important for Success in NFL**
  - ❖ **Owner**
    - ❖ **Establish Team Identity**
    - ❖ **Hire Leadership**
    - ❖ **Provide Resources**
  - ❖ **General Manager**
    - ❖ **Evaluate Players**
    - ❖ **Make Trades and Acquire Players**
    - ❖ **Final Say on Personnel (20/32 Teams)**
  - ❖ **Coach**
    - ❖ **Responsible for Player Development**
    - ❖ **Responsible for On-Field Strategy**
    - ❖ **Real-Time Game Decisions**
  - ❖ **Quarterback**
    - ❖ **Throws the Rock**
    - ❖ **Highest Paid Position**

Importance of the Quarterback
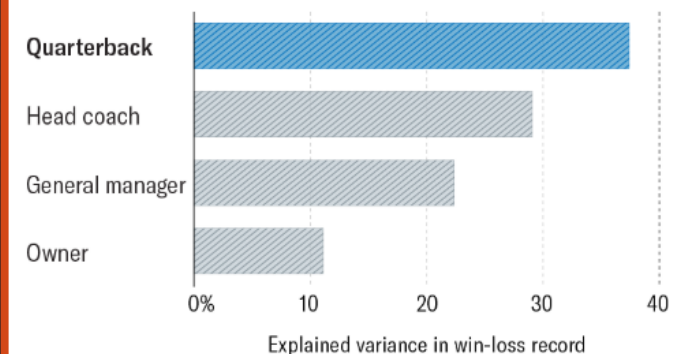
❖ We Know All Are Important #Browns

❖ What is the Most Important?

❖ Analysis Published in Harvard Business Review
  ❖ 38 Years of Data
  ❖ Basic Linear Regression (RSQ=0.682)
  ❖ Order of Importance by Percentage of RSQ
  ❖ Comparison of 80s and 90s
    ❖ Head Coach Effect Unchanged
    ❖ Owner and General Manager Effects Declined
    ❖ Value of QB has increased

Quarterbacks Are More Important Than Coaches, GMs, and Owners

A team's success or failure is most dependent on the player receiving the snap.

Explained variance in win-loss record

Metrics for Quarterbacks

❖ **Article from Bleacher Report**
  ❖ Passing YDS (Bad Metric to Measure Success)
  ❖ TD/INT (Accounts for Most Important Info)
  ❖ COMP/ATT (Misleading)
  ❖ YDS/ATT (Leaves Out Sacks and Touchdowns)
  ❖ Passer Rating (Accounts for Most QB Information)
    ❖ Dates Back to 1971 and Hasn't Changed
    ❖ Minimum = 0 & Maximum = 158.3
    ❖ Leader in 2018 Was Danny Amendola
  ❖ QBR (Produced by ESPN)
    ❖ Created in 2011
    ❖ Minimum = 0 & Maximum = 100
    ❖ Compares Outcome to Expected Outcome
    ❖ Leaders in 2018 Were Patrick Mahomes and Drew Brees
  ❖ W/G (Classic Problem Similar to Baseball Pitching)

YDS = Yards
TD = Touchdown
INT = Interception
COMP = Completion
ATT = Attempts
W = Wins
G = Games

Metrics for Quarterbacks

❖ **Advanced Stats from Football Outsiders**
  ❖ **Defense-Adjusted Value Over Average (DVOA)**
  ❖ **Defense-Adjusted Yards Over Replacement (DYOA)**

❖ **Advanced Stats from Brian Burke (Advanced Football Analytics)**
  ❖ **Win Probability Added (WPA)**
  ❖ **Expected Points Added (EPA)**

YDS = Yards
TD = Touchdown
INT = Interception
ATT = Attempts
SYDS=Sack Yards
S=Sacks

Tom Brady VS Aaron Rodgers

❖ **Quarterback's Rating Based on 4 Stats (NFL)**
  - ❖ **Comp/ATT**
  - ❖ **YDS/ATT**
  - ❖ **INT/ATT**
  - ❖ **TD/ATT**

❖ **Critique: "Any system for rating quarterbacks based on passing statistics is really rating the team's entire passing game."**

❖ **Estimated Linear Model for Wins**
  - ❖ **Conducted by Brian Burke (ESPN)**
  - ❖ **Data from 2002-2006**
  - ❖ **Created Total QBR for ESPN in 2016**

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COMP = Completion
ATT = Attempts

Tom Brady VS Aaron Rodgers

❖**Independent Variables for Wins**

TRUOPASS = offense (passing yards allowed − sack yards)/passing plays

TRUDPASS = defense (passing yards allowed − sack yards)/passing plays

ORUNAVG = offense rushing yards allowed/rushing attempts

DRUNAVG = defense rushing yards allowed/rushing attempts

OINTRATE = interceptions thrown/passing attempts

DINTRATE = interceptions made/passing attempts

OFUMRATE = offensive fumbles/all offensive plays (not fumbles lost)[6]

DFFRATE = defensive forced fumbles/all defensive plays

PENRATE = each team's penalty yards/all plays, offensive and defensive

OPPPENRATE = opponent's penalty yards/all plays, offensive and defensive

Tom Brady VS Aaron Rodgers

❖ **Results of Regression**

Variable	Coefficient	p-value
const	5.2602	0.06281
TRUOPASS	1.54337	<0.00001
TRUDPASS	−1.66731	<0.00001
ORUNAVG	0.91979	0.00071
DRUNAVG	−0.553532	0.04842
OINTRATE	−50.0957	0.0012
DINTRATE	83.6627	<0.00001
OFUMRATE	−63.9657	0.00053
DFFRATE	78.6917	0.0001
PENRATE	−4.48514	0.01283
OPPPENRATE	6.5826	0.0004

All Passing Information

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Contribution from Offense QB

$$QBR\ (Book) = 1.543(TRUOPASS) - 50.096(OINTRATE)$$

Tom Brady VS Aaron Rodgers

❖ **Comparing Ratings in 2016**

Player	Our Ranking	OldQBR	TOTALQBR
Matt Ryan	1	117.1	79.6
Tom Brady	2	112.2	79.4
Dak Prescott	3	104.9	77.6
Aaron Rodgers	12	104.2	72.4
Drew Brees	5	101.7	66.8
Kirk Cousins	4	97.2	66.5
Andrew Luck	9	96.4	65.9
Matthew Stafford	13	93.3	65.2
Tyrod Taylor	18	89.7	62.4
Alex Smith	14	91.2	60.8

Tom Brady VS Aaron Rodgers

❖ **Correlation Between Ratings**
    ❖ Book with QBR (0.9)
    ❖ Book with Total QBR (0.82)

❖ **Further Adjustment Needed to Measure the Quality of the Quarterback?**

❖ **Book Points Out the Difficulty in Understanding How the Offensive Line Contributes to the QB's Success**

Final Inspiration

All I know is grind.

- Reverend Ray Lewis