

Has the NFL Become Overly Offense & Quarterback Dependent?

Introduction	General Offensive Trends	Importance of QB Play	Leaning into the Passing Game	Increased Emphasis on QB Performance	General Defensive Trends	Can Defensive Oriented Teams Adapt?
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Addressing the Issue:

- There is a consensus that the NFL has become increasingly offense centric in recent years. This is in direct contraction to the NFL of old, where defenses won championships.
- The trend towards offensive favoritism is influenced by current league rules that skew advantage to the offense by increasing the level of defensive play scrutiny and consequential penalty severity. This can be accredited towards two main factors: viewership and player safety.
- The adoption of an offensive friendly league has coincided with the increased popularity of the game but has resulted in a system that is now overly reliant upon star players. The modern NFL offensive is heavily dependent upon the play of the quarterback position, and therefore a team's success is a direct reflection of the level of its quarterback play.
- Investment in supporting quarterback play has decreased the value of the running game and well rounded teams in general that build fortitude through a multitude of positions throughout the team. The current trend is to invest heavily into a few positions of priority that can directly effect quarterback performance like Wide Receiver and Left Tackle.
- Increased offensive advantage and the rarity of elite quarterback play has created a cycle within the NFL that has promoted a few select teams to an embodiment of inevitability. As for the rest of the league, teams are in a state of limbo or just holding out hope for obtaining a savior quarterback at great cost.
- This cycle has resulted in predictability and staleness within the league that may reduce fan engagement over time.
- Can team success be had by pursuing strategies outside of elite quarterback play and offensive favored team building?

Process:

- Data was prepared through combining 20+ years of offensive and defensive data provided by Pro-Football Reference. No single dataset encompassed all necessary variables. Specific variables were identified and selected from various data sets and then amended to a data frame manually through Excel.
- The following variables were created to facilitate in-depth analysis outside of the variables provided by Pro-Football Reference:
 - EXP. Per game
 - Off. TD Per game
 - Passing Play Percentage
 - Pen FD per game
 - Rushing Play Percentage
 - Completion percentage

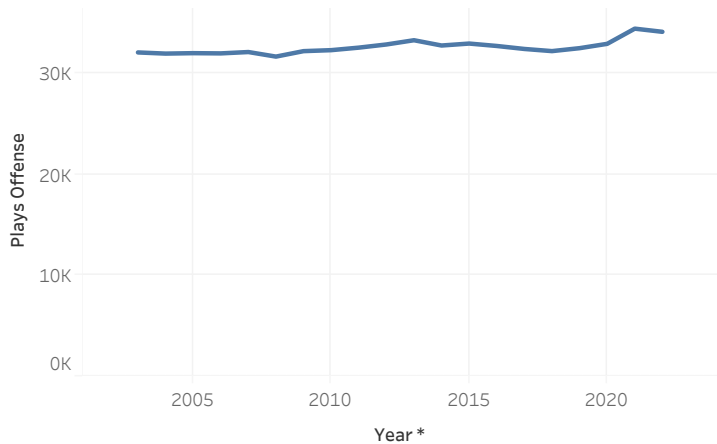
Data Provided By:

- Pro-Football Reference
<https://www.pro-football-reference.com/>

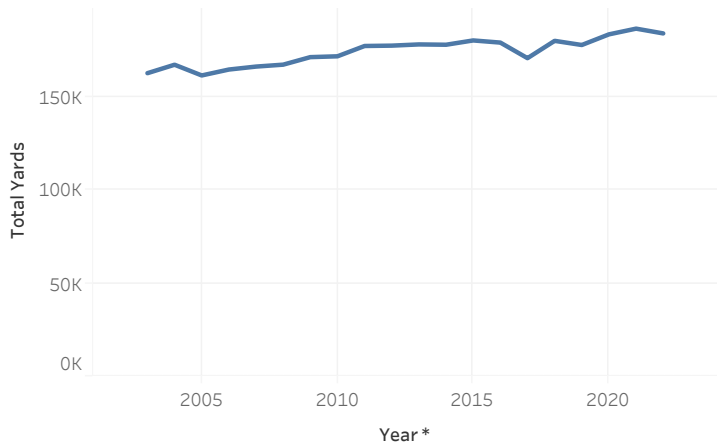
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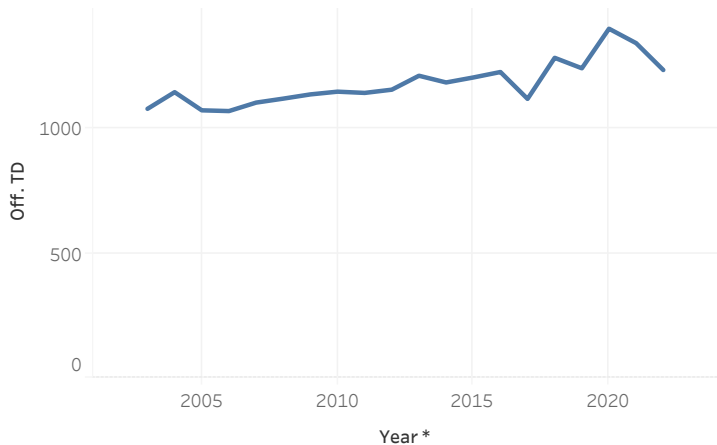
Offensive Plays by Year



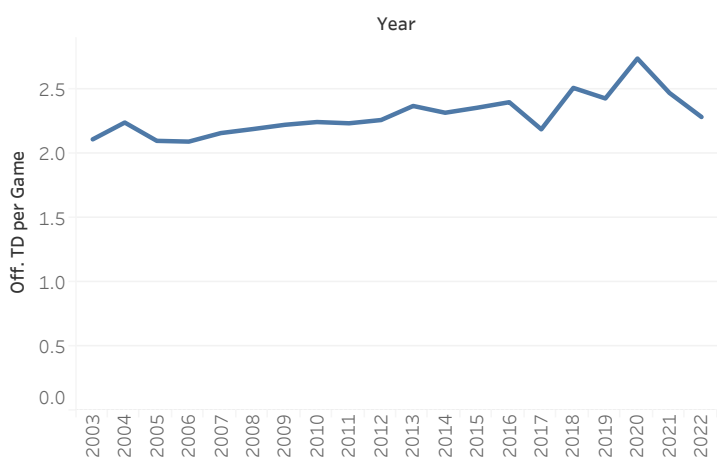
Offensive Yards by Year



Offensive TD Total by Year



Offensive Touchdowns Per Game

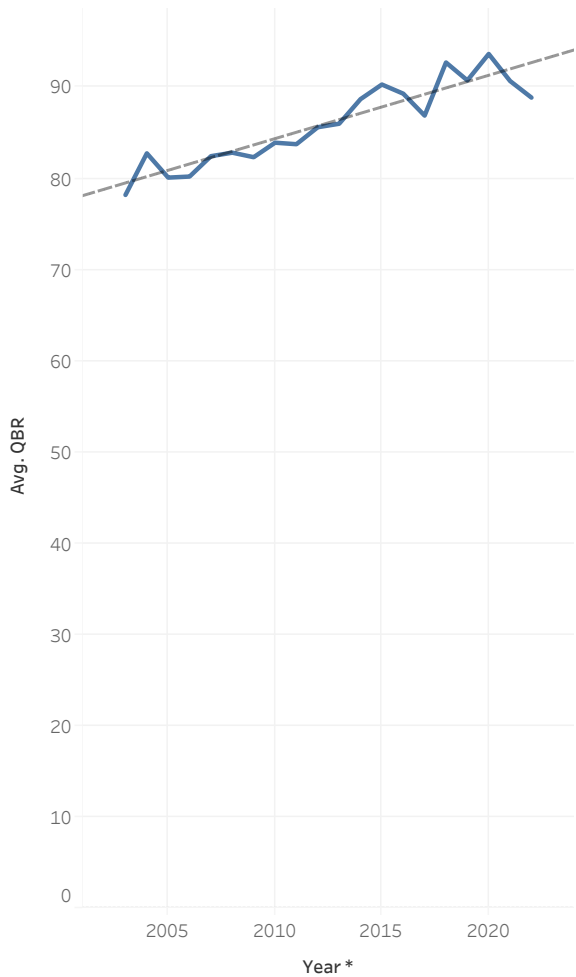


- Offensive performances have been on a steady rise over the past 20+ years.
- The number of Touchdowns and Touchdowns/Game have experienced rapid growth.
- 2017 proves to be an outlier to the overall trend. All four graphs show a significant dip in offensive performance. It should be noted that the Philadelphia Eagles won the Super Bowl that season with a backup quarterback.

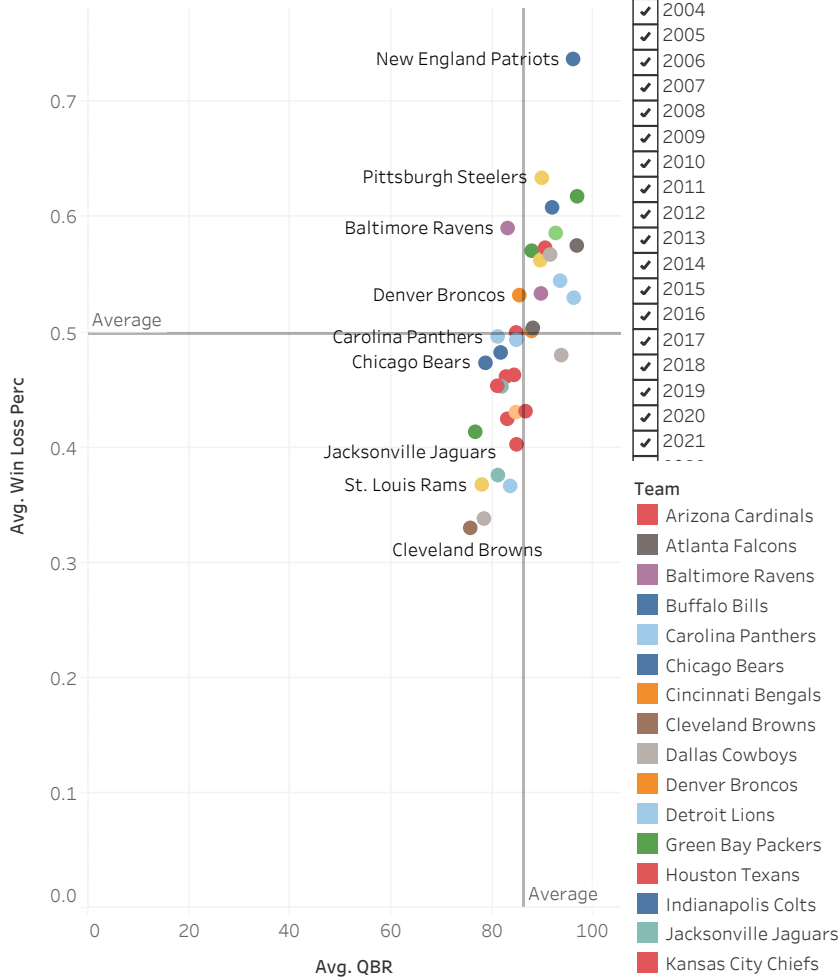
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Average QBR over time



Overall QBR and Win Percentage by Team

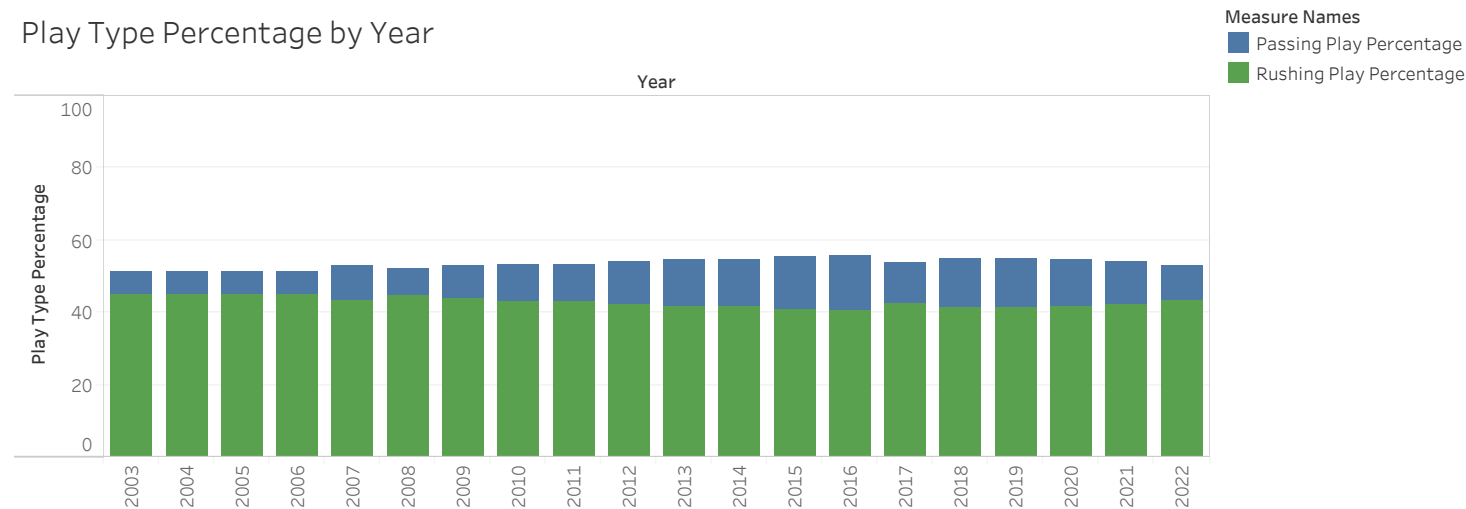


- QBR is a metric that evaluates quarterback play.
- QBR has increased greatly overtime, which a recent decline.
- QBR is heavily correlated with winning percentage.
- Most of the teams in the upper right quadrant (high win rate and QBR) have had elite and well-known quarterbacks on their rosters.

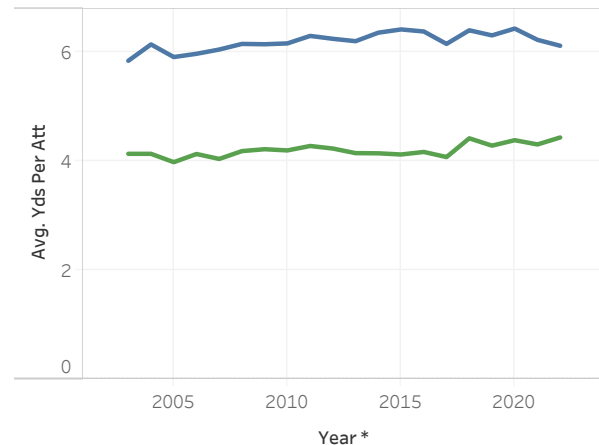
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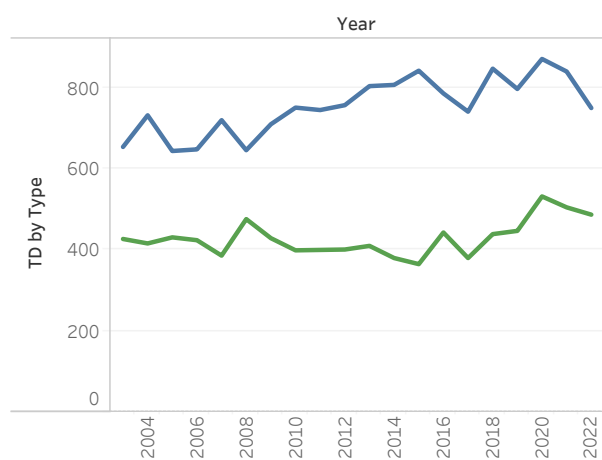
Play Type Percentage by Year



Yds. Per Attempt by Year by Play Type



Touchdowns by Type

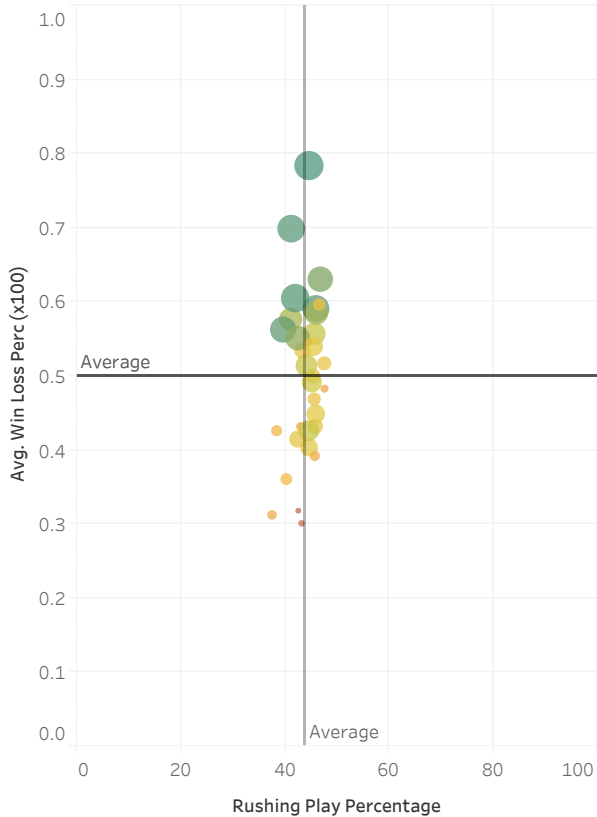


- The number of passing plays have always outnumbered the number of rushing plays. This is not a new trend.
- The difference in the two types of play calls saw a period of consistent growth beginning in 2009 through 2020, where the difference began to decrease.
- It should be noted that many NFL defenses began to implement 2 high safety shell formations more often around 2020. These schemes discourage passing plays by "inviting" teams to run the ball.

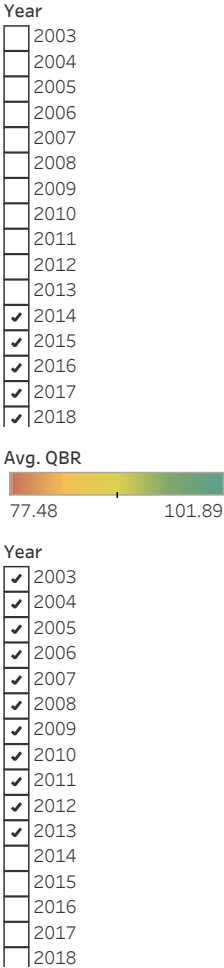
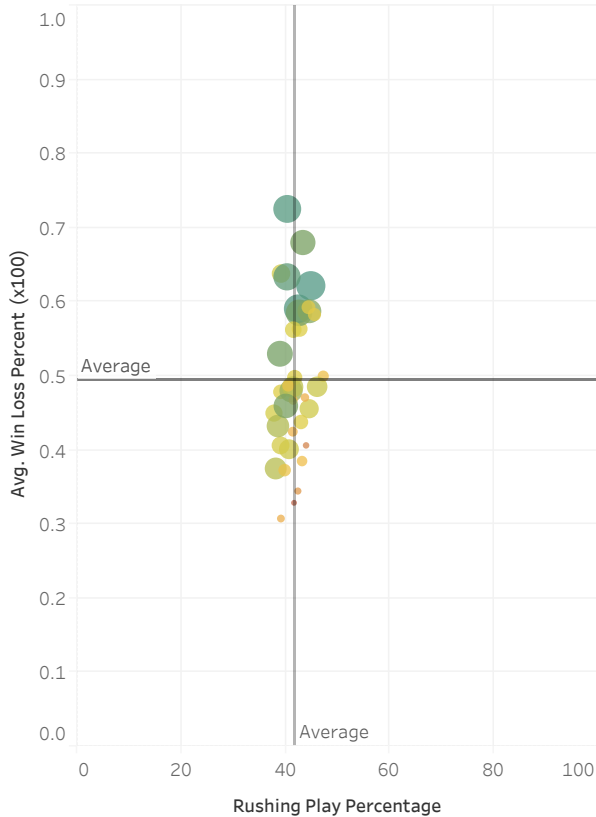
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Rushing Play Percentage and Win Percentage Considering QBR (2003-2013)



Rushing Play Percentage and Win Percentage Considering QBR (2014-2022)

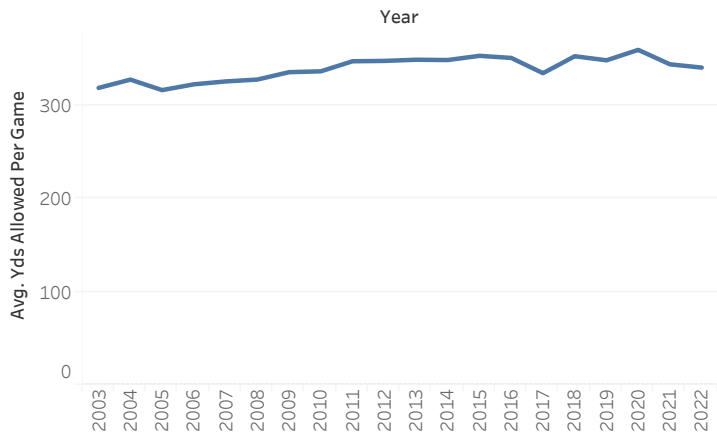


- There is a clear separation of top performing teams in the later plot, success has become heavily dependent on QBR.
- Most average to poor QBR teams have migrated towards a below avg winning percentage during this past decade. The previous decade saw much more team success with average QBR.
- This has resulted in the creation of a "middle class". These teams are in a "purgatory" in which they experience consistent average QBR and average win percentage. These teams are forced to look to the draft and free agency for greater quarterback play.
- Despite this, there is a clear shift in rushing play percentage towards a lower percentage (2 percent). Many teams have skewed towards below average rushing play percentage proving that the emphasis is on passing plays regardless of QBR.
- Elite QB play has continued to have the same effect on win percentage. It has always been correlated with success.

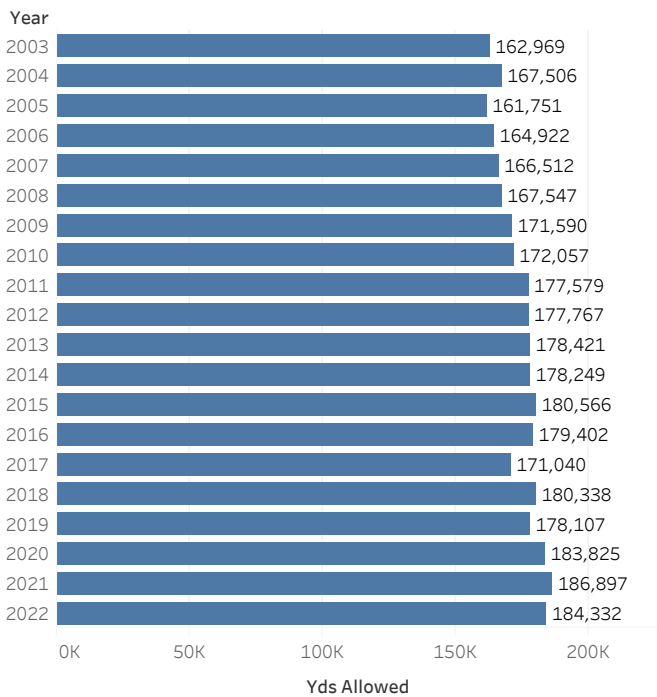
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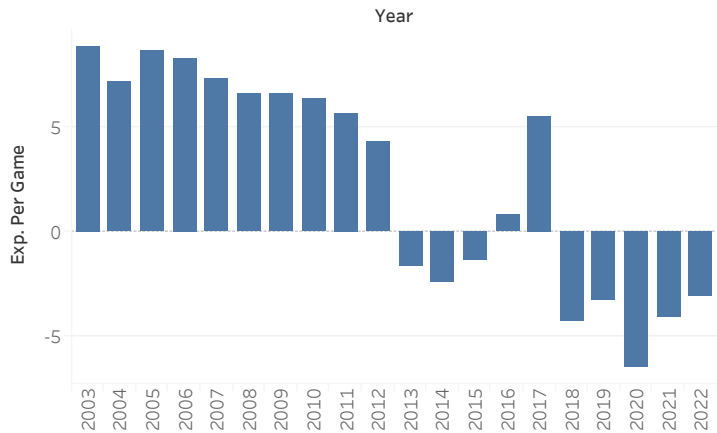
YDS Allowed Per Game Avg.



Total YDS Allowed Per Year



Defensive Points Expected Per Game

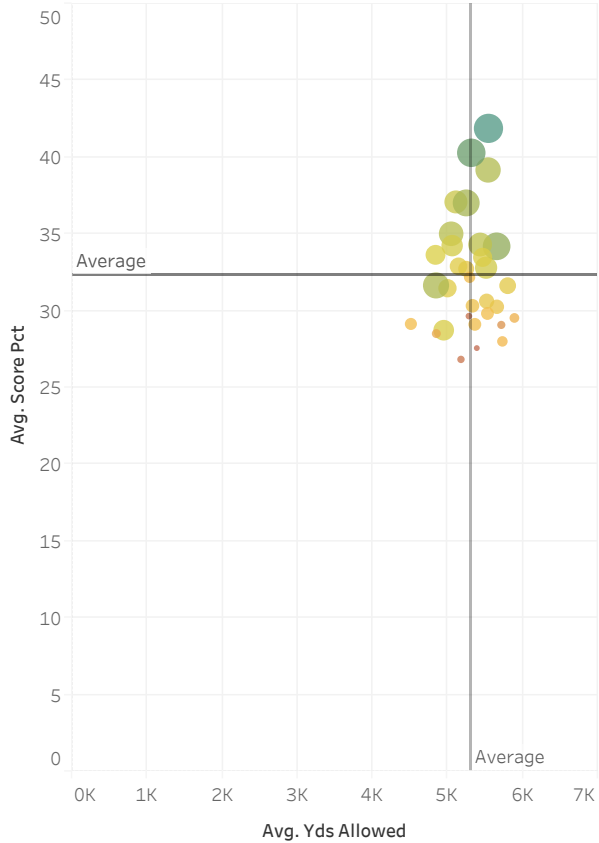


- Defensive Performance has been trending down over the time span of the data set.
- Defensive Points Expected is a relatively complex statistic that can be summed up as the quantification of the impact a defensive unit on preventing the opposing team from scoring or reducing their potential to score.
- This trend can be attributed to an emphasis on offense when team building, influx of physical talent on the offensive side due to higher pay, or increased penalties called. Further analysis would need to be conducted to find the cause.

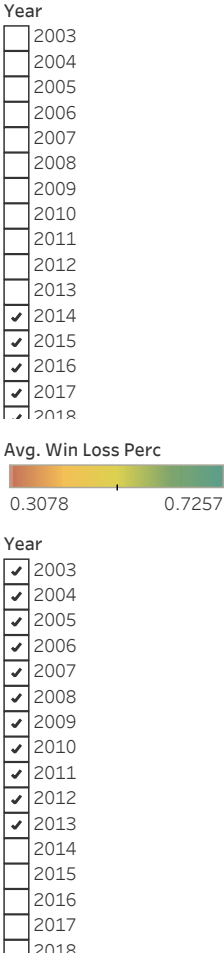
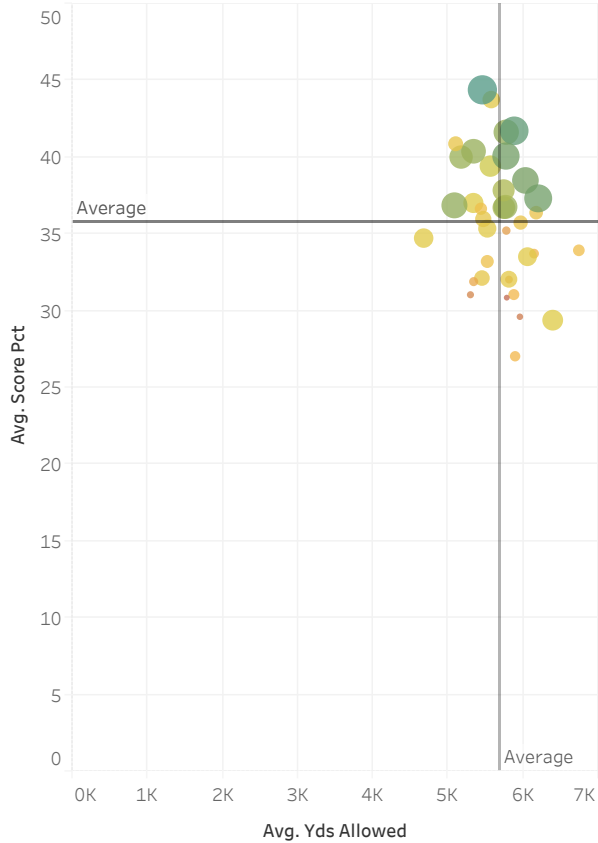
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Defensive and Offensive Performances vs Win-Percentage (2003-2013)



Defensive and Offensive Performances vs Win-Percentage (2014-2022)

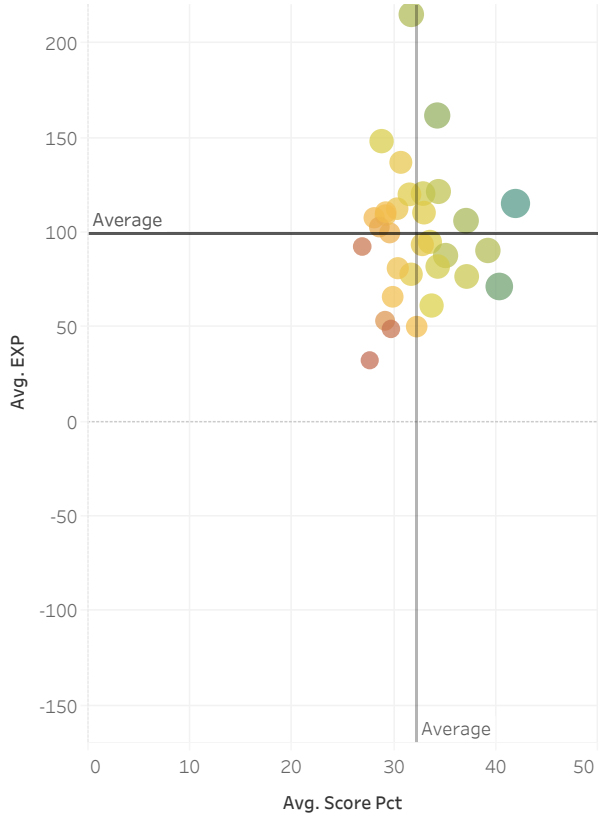


- The previous decade produced average to above-average win percentage teams that experienced below average offensive performances but above average defenses (lower right quadrant).
- Above average Scoring Percentage has always correlated with a higher win rate percentage.
- Scoring Percentage average has experienced significant increase.
- This past decade has produced a higher range of variability in yards allowed. The previous decade produced yards allowed metrics skewed more toward average.
- This past decade has not produced any successful teams in the lower right quadrant.
- This past decade has produced many successful teams with below average defensive yards allowed.

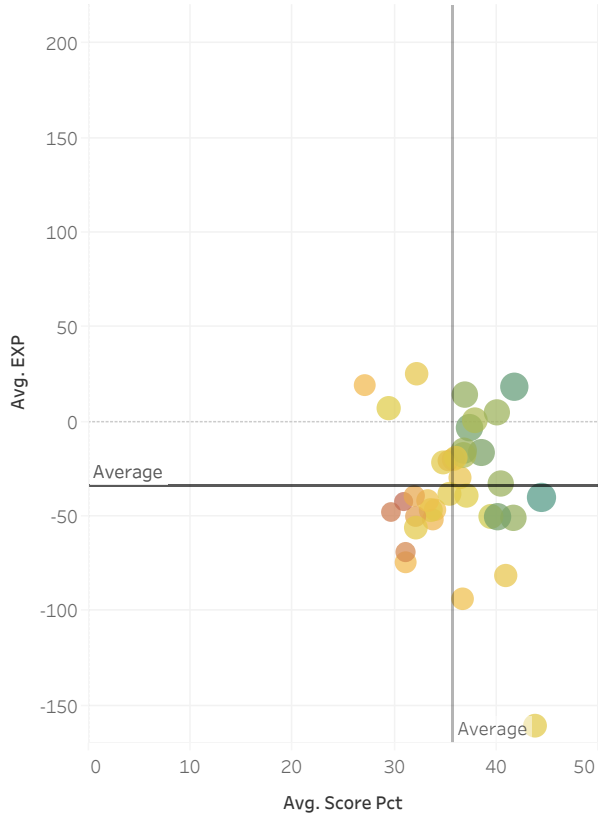
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Defensive Points Expected and Offensive Scoring against Win Percentage (2003-2013)



Defensive Points Expected and Offensive Scoring against Win Percentage (2014-2022)



Avg. Win Loss Perc
0.3013 0.7842

- Year
- ☐ 2003
 - ☐ 2004
 - ☐ 2005
 - ☐ 2006
 - ☐ 2007
 - ☐ 2008
 - ☐ 2009
 - ☐ 2010
 - ☐ 2011
 - ☐ 2012
 - ☐ 2013
 - ☒ 2014
 - ☒ 2015
 - ☒ 2016
 - ☒ 2017
 - ☒ 2018

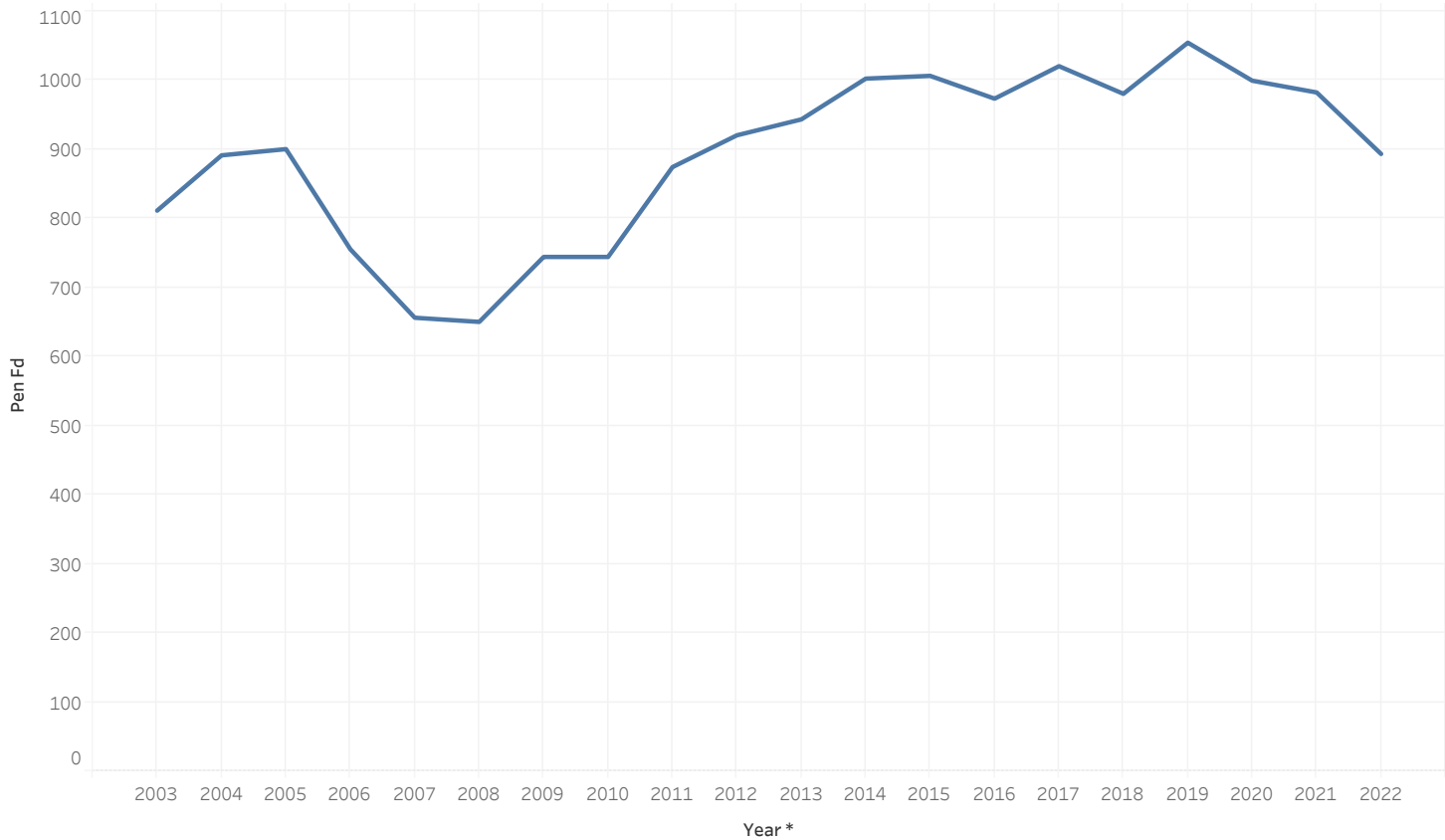
- Year
- ☒ 2003
 - ☒ 2004
 - ☒ 2005
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 - ☒ 2011
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 - ☐ 2015
 - ☐ 2016
 - ☐ 2017
 - ☐ 2018

- Defensive Points Expected has dropped at an alarming rate, to well below zero.
- There are no longer any outliers in terms of high Average Defensive EXP. These outliers represent teams that had success through elite defensive efforts and average offensive production.
- Win precentage was much more variable in the older decade. This is made evident by the locations of the green dots which can be found in many various places within the graph. This past decade saw successful teams primarily in the upper left quadrant which correlates with above average offenses and defenses.
- It appears that teams must deploy successful offenses and above average defenses in order to win at a high rate. This does not speak to an emphasis on defensive play as the average has dropped so heavily. Defense is still correlated with win rate, but actual contribution is trending down across the league.

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First Downs Awarded Through Penalty by Year



- A potential explanation to a decrease in defensive performances can lie within the number of penalties called against defenses.
- The NFL has recognized that an increase in offensive play and scoring leads to higher viewership rates. They have also become increasingly concerned with solving various moral issues surrounding player safety as medical research into the subject has provided increased insight into the true risks that players face.
- As such, the NFL has implemented a double-edged sword by placing the burden of player safety upon modern defenses through player safety related rules that also happen to favor the offense and keep offensive units on the field.
- This issue can be examined through the rise in penalties called against defenses that award first downs and extend offensive drives which can result in a higher scoring percentage and lower defensive unit statistics.
- A recent downward trend reflects the criticism that the league has received regarding this issue. It is clear that the league is committed to reducing frivolous penalties and eliminate controversy.