# Offense Pass Completion as a Predictor of NFL Score Differential*

**A comparision betweeen**

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Measuring the importance of an NFL team's offense by

## Introduction

Increase in quarterback pay as % of salary cap (**CBS?**)

## Data

The `nfl-team-statistics.csv` dataset provided by SCORE Sports Data Repository (n.d.) contains statistics about the regular season performance for each NFL team from 1999 to 2022. The data was collected using the `nflreadr` package (Ho and Carl 2025)in R.

## Methods

I fit the simple linear regression model

$$Y_i = \beta_0 + \beta_1 X_i + \varepsilon_i$$

to understand the relationship between our predictor variable, offense completion percentage, and our outcome variable, score-differential. In this model, $X_i$ represents offense completion percentage of the $i$th observation and $Y_i$ represents the score-differential of the $i$th outcome.$\beta_0$ represents the intercept coefficient, what we expect score-differential to be when the offense
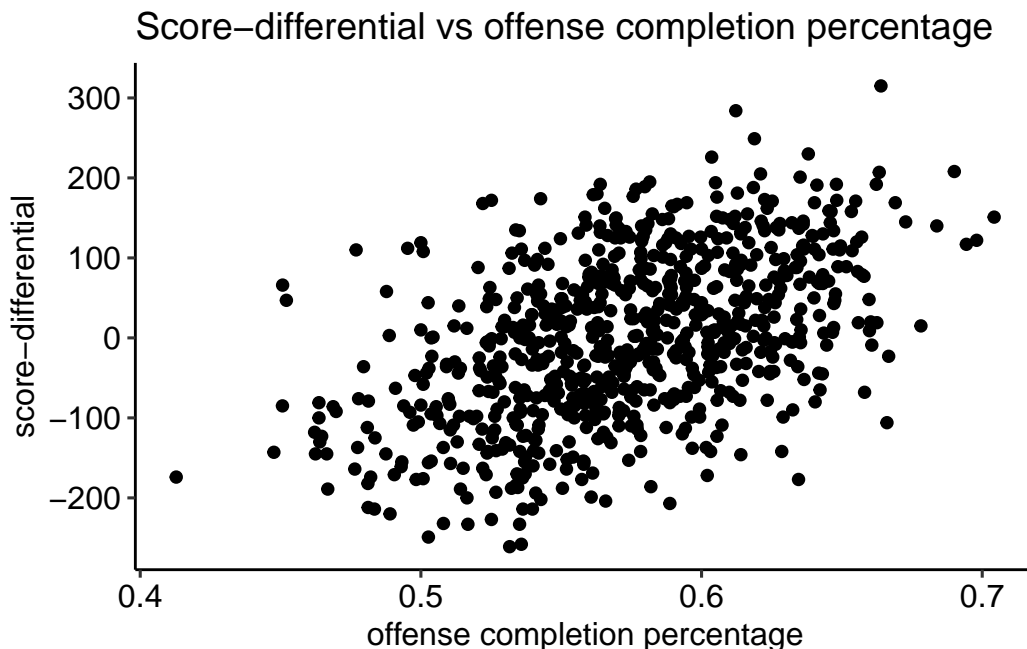
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Figure 1: Scatter plot with offense completion percentage as the predictor values and score-differential as the outcome values

has a completion percentage of 0%. $\beta_1$ represents the slope coefficient, what we expect the increase in score-differential will be for every percent increase in completion percentage. In this model, we assume the error term, $\varepsilon_i$ to be random with mean 0 and finite variance $\sigma^2$.

I implemented this analysis using the R programming language (R Core Team 2025)

## Results

weakness: Quality of receiver. This regression analysis also ignores the quality of the team's defense. Sc

## References

n.d. https://data.scorenetwork.org/football/nfl-team-statistics.html.

Ho, Tan, and Sebastian Carl. 2025. *Nflreadr: Download 'Nflverse' Data.* https://CRAN.R-project.org/package=nflreadr.

R Core Team. 2025. *R: A Language and Environment for Statistical Computing.* Vienna, Austria: R Foundation for Statistical Computing. https://www.R-project.org/.