

Regression Analysis

The regression equation is
 $\text{Win \%} = 0.102 + 0.000209 \text{ RushYard}$

$S = 0.204864$ $R\text{-sq} = 13.27\%$ $R\text{-sq(adjusted)} = 10.38\%$ $R\text{-sq(predicted)} = 3.07\%$

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Regression	1	0.1926	0.19262	4.59	0.040
RushYard	1	0.1926	0.19262	4.59	0.040
Error	30	1.2591	0.04197		
Lack-of-Fit	29	1.0638	0.03668	0.19	0.972
Pure Error	1	0.1953	0.19531		
Total	31	1.4517			

Method and Purpose

The purpose of this study was to determine the relationship between total rushing yards and win percentage in the 2020 regular season of the NFL, and to determine whether the two were even related. I hypothesized that more win percentage would increase as the number of total rushing yards increased as well. I was curious to explore this topic because generally people believe, from what I gathered through casual conversations with friends, that most NFL wins occur due to long ranged touchdown passes. However, I believe that rushing the field plays a huge role. I collected my data from the Pro Football Reference and official NFL website, which shows a variety of NFL statistics. The sample for the data was all 32 teams in the NFL. Since there are not too many teams, I decided to use all of them for my analysis (Total Population & Census). Based on the results, a correlation coefficient of 0.364 explains that there was a relatively low correlation between a teams total rushing yards and the win percentage in the 2020 season. The correlation of determination suggests that there is a 13.27% of variation in the total win percentages and that only 13.27% of the data fit the regression model.

		G	ATT	Yds	TD	N	YA	Y/G	FMB	EXP
1	Baltimore Ravens	16	555	3071	24	72	5.5	191.9	25	116.76
2	Tennessee Titans	16	521	2690	26	94	5.2	168.1	15	58.09
3	Cleveland Browns	16	495	2374	21	59	4.8	148.4	23	33.06
4	New England Patriots	16	502	2346	20	49	4.7	146.6	19	57.63
5	Minnesota Vikings	16	468	2283	20	70	4.9	142.7	22	32.49
6	New Orleans Saints	16	494	2265	30	49	4.6	141.6	27	49.14
7	Arizona Cardinals	16	479	2237	22	69	4.7	139.8	22	49.64
8	Green Bay Packers	16	443	2118	16	77	4.8	132.4	11	43.48
9	Philadelphia Eagles	16	403	2027	16	82	5.0	126.7	31	30.39
10	Los Angeles Rams	16	473	2018	19	61	4.3	126.1	19	-21.02
11	Indianapolis Colts	16	459	1996	20	62	4.3	124.8	8	12.49
12	Seattle Seahawks	16	411	1971	15	50	4.8	123.2	14	26.56
13	Denver Broncos	16	442	1918	13	65	4.3	119.9	23	-13.97
14	Las Vegas Raiders	16	457	1916	20	43	4.2	119.8	24	17.40
15	San Francisco 49ers	16	437	1889	19	80	4.3	118.1	20	-18.51
16	Kansas City Chiefs	16	403	1799	13	32	4.5	112.4	19	31.62
17	Dallas Cowboys	16	430	1788	14	42	4.2	111.8	19	21.70
18	Los Angeles Chargers	16	466	1784	12	36	3.8	111.5	16	-15.56
19	New York Giants	16	399	1768	13	80	4.4	110.5	20	-2.39
20	Buffalo Bills	16	411	1723	16	51	4.2	107.7	18	-1.50
21	Carolina Panthers	16	407	1704	19	45	4.2	106.5	13	20.87
22	Miami Dolphins	16	428	1688	15	31	3.9	105.5	17	-19.99
23	New York Jets	16	406	1683	9	46	4.1	105.2	8	-6.76
24	Cincinnati Bengals	16	411	1668	13	55	4.1	104.3	20	-28.73
25	Chicago Bears	16	393	1647	12	80	4.2	102.9	20	1.57
26	Washington Football Team	16	400	1611	18	40	4.0	100.7	24	19.76
27	Atlanta Falcons	16	409	1532	13	62	3.7	95.8	16	-17.02
28	Jacksonville Jaguars	16	337	1519	9	47	4.5	94.9	16	9.41
29	Tampa Bay Buccaneers	16	369	1519	16	98	4.1	94.9	12	-11.99
30	Detroit Lions	16	367	1499	17	54	4.1	93.7	13	-12.40
31	Houston Texans	16	344	1466	10	48	4.3	91.6	21	-9.85

32	Pittsburgh Steelers	16	373	1351	12	59	3.6	84.4	22	-45.84
	Avg Team		431.0	1902.1	16.6	59	4.4	118.9	18.7	12.7
	League Total		13792	60868	532	98	4.4	118.9	597	
	Avg Tm/G		26.9	118.9	1.0		4.4	118.9	1.2	

RushYard and WIN % DATA: <https://www.pro-football-reference.com/years/2020/index.htm>
<https://www.nfl.com/stats/team-stats/>

Descriptive Statistics

Variable	N	*	Mean	SE Mean	StDev	Minimum	Q1	Median	Q3	Maximum
RushYard	3	0	1901.8	66.6	376.7	1351.0	1652.3	1788.5	2095.3	3071.0
%	3	0	0.500	0.0383	0.216	0.0630	0.313	0.4690	0.688	0.8750
	2		2		4		0		0	

Conclusion + Flaws

Many different factors go into winning a professional football game; Playcalling, adaptation, passing offense, rushing defense, and passing defense. Connor, an applied Statistics major at Purdue University, conducted a sports study explaining the many correlations between these factors and win percentages for the 2018 NFL season.

<https://www.samford.edu/sports-analytics/fans/2019/The-Most-Important-Aspect-to-Winning-Football-Games-from-Last-Years-NFL-Season>

As shown in the study, the results from my studies are unable to apply to a larger population and should only be kept to a specific season. Sports statistics are too unpredictable which results in flaws when conducting a single season correlational study.

R = .6370 for Rushing Offense 2018