

Understanding NFL Team Valuations

By, Chandler Stegen

Main Question: Where should the NFL expand?

- Regions without NFL teams?
- More populated regions with already existing teams?
- International expansion?
 - Mexico
 - England
 - Germany



Why Team Valuations?

- What makes a team valuable?
 - Understanding what factors make a team valuable can help determine where the NFL might want to relocate
- NFL is a business: Profit Focused
- Hypothesis: Variables relating to a team's market size, stadium factors, and branding are most important to determining the value of an NFL franchise

Team	Team Valuation(2021 Forbes)
Dallas Cowboys	\$6,500,000,000
New England Patriots	\$5,000,000,000
New York Giants	\$4,850,000,000
Los Angeles Rams	\$4,800,000,000
Washington Commanders	\$4,200,000,000
San Francisco 49ers	\$4,175,000,000
Chicago Bears	\$4,075,000,000
New York Jets	\$4,050,000,000
Philadelphia Eagles	\$3,800,000,000
Denver Broncos	\$3,750,000,000
Houston Texans	\$3,700,000,000
Seattle Seahawks	\$3,500,000,000
Green Bay Packers	\$3,475,000,000
Pittsburgh Steelers	\$3,430,000,000
Miami Dolphins	\$3,420,000,000
Las Vegas Raiders	\$3,415,000,000
Baltimore Ravens	\$3,400,000,000
Minnesota Vikings	\$3,350,000,000
Indianapolis Colts	\$3,250,000,000
Atlanta Falcons	\$3,200,000,000
Tampa Bay Buccaneers	\$2,940,000,000
Kansas City Chiefs	\$2,930,000,000
Los Angeles Chargers	\$2,920,000,000
Carolina Panthers	\$2,910,000,000
New Orleans Saints	\$2,825,000,000
Jacksonville Jaguars	\$2,800,000,000
Arizona Cardinals	\$2,650,000,000
Tennessee Titans	\$2,625,000,000
Cleveland Browns	\$2,600,000,000
Detroit Lions	\$2,400,000,000
Cincinnati Bengals	\$2,275,000,000
Buffalo Bills	\$2,270,000,000

Data Collection

Biggest Challenges

- Properly arranging data from multiple sources
- Converting to general format
 - Dollar Amounts not listed properly
 - Removing commas
 - Accounting for inflation
- Manual Entry
 - Branding Data only available in a picture

Challenge 1: Properly Arranging data

Example of Transforming Team Valuation Data:



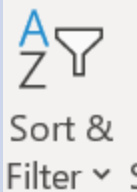
Problem: Data organized differently from different sources



Solution: Sort data alphabetically by team name



How: Utilized sort function in excel

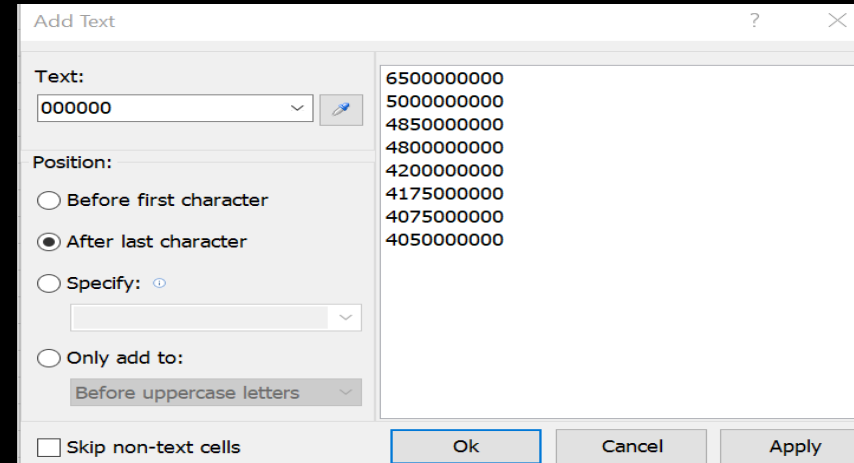


Value of National Football League franchises 2021	
Franchise value of National Football League teams in 2021 (in million U.S. dollars)	
Dallas Cowboys	6500
New England Patriots	5000
New York Giants	4850
Los Angeles Rams	4800
Washington Football Team	4200
San Francisco 49ers	4175
Chicago Bears	4075
New York Jets	4050
Philadelphia Eagles	3800
Denver Broncos	3750
Houston Texans	3700
Seattle Seahawks	3500
Green Bay Packers	3475
Pittsburgh Steelers	3430
Miami Dolphins	3420
Las Vegas Raiders	3415
Baltimore Ravens	3400
Minnesota Vikings	3350
Indianapolis Colts	3250
Atlanta Falcons	3200
Tampa Bay Buccaneers	2940
Kansas City Chiefs	2930
Los Angeles Chargers	2920
Carolina Panthers	2910
New Orleans Saints	2825
Jacksonville Jaguars	2800
Arizona Cardinals	2650
Tennessee Titans	2625
Cleveland Browns	2600
Detroit Lions	2400
Cincinnati Bengals	2275
Buffalo Bills	2270

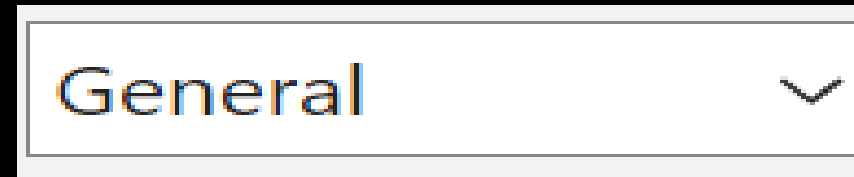
Team	Team Valuation(2021 Forbes)
Arizona Cardinals	2650000000
Atlanta Falcons	3200000000
Baltimore Ravens	3400000000
Buffalo Bills	2270000000
Carolina Panthers	2910000000
Chicago Bears	4075000000
Cincinnati Bengals	2275000000
Cleveland Browns	2600000000
Dallas Cowboys	6500000000
Denver Broncos	3750000000
Detroit Lions	2400000000
Green Bay Packers	3475000000
Houston Texans	3700000000
Indianapolis Colts	3250000000
Jacksonville Jaguars	2800000000
Kansas City Chiefs	2930000000
Las Vegas Raiders	3415000000
Los Angeles Chargers	2920000000
Los Angeles Rams	4800000000
Miami Dolphins	3420000000
Minnesota Vikings	3350000000
New England Patriots	5000000000
New Orleans Saints	2825000000
New York Giants	4850000000
New York Jets	4050000000
Philadelphia Eagles	3800000000
Pittsburgh Steelers	3430000000
San Francisco 49ers	4175000000
Seattle Seahawks	3500000000
Tampa Bay Buccaneers	2940000000
Tennessee Titans	2625000000
Washington Commanders	4200000000

Challenge 2: Converting to a usable format

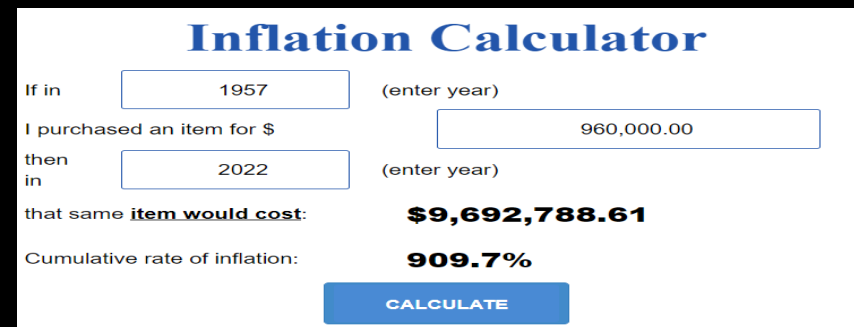
Problem 1: Some data was not in proper value



Problem 2: Data that already had commas or in dollar amounts



Manually copy pasted values into an inflation calculator



Inflation Calculator

If in (enter year)

I purchased an item for \$

then in (enter year)

that same **item would cost:** **\$9,692,788.61**

Cumulative rate of inflation: **909.7%**

CALCULATE

<https://www.usinflationcalculator.com/>

Challenge 3: Manual Entry

- **Example: Converting Branding Data**
 - Issue:
 - Data not in a text format
 - Data ordered by Total Rank and NOT alphabetical

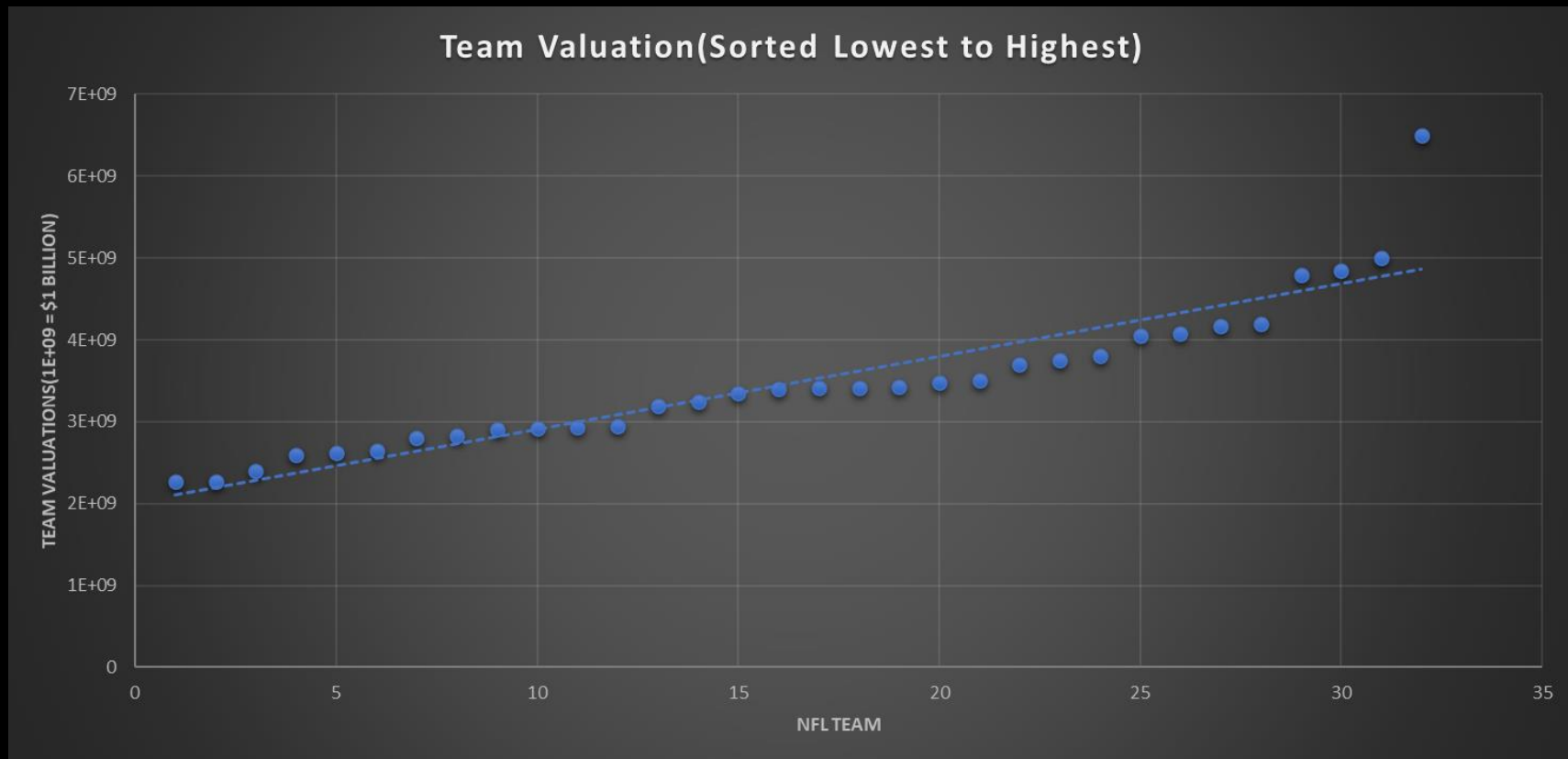
TEAM	FAN EQUITY RANK	SOCIAL EQUITY RANK	TOTAL RANK
COWBOYS	2	3	1
PATRIOTS	5	1	2
PACKERS	1	7	3
BRONCOS	3	6	4
STEELERS	11	2	5
EAGLES	9	4	6
49ERS	4	12	7
GIANTS	8	10	8
PANTHERS	14	5	9
BEARS	6	14	10
SEAHAWKS	13	8	11
TEXANS	12	13	12
SAINTS	7	19	13
FALCONS	18	9	14
CHARGERS	16	17	15
LIONS	19	15	16
RAVENS	10	24	17
COLTS	15	20	18
RAIDERS	26	11	19
DOLPHINS	17	21	20
JETS	23	18	21
BROWNS	27	16	22
BILLS	22	23	23
VIKINGS	20	28	24
CARDINALS	24	25	25
WASHINGTON FT	21	31	26
BENGALS	31	22	27
JAGUARS	25	29	28
CHIEFS	28	27	29
BUCCANEERS	30	26	30
TITANS	29	30	31
CARDINALS	32	32	32



Team	Fan Equity Rank	Social Equity Rank	Total Rank
Arizona Cardinals	24	25	25
Atlanta Falcons	18	9	14
Baltimore Ravens	10	24	17
Buffalo Bills	22	23	23
Carolina Panthers	14	5	9
Chicago Bears	6	14	10
Cincinnati Bengals	31	22	27
Cleveland Browns	27	16	22
Dallas Cowboys	2	3	1
Denver Broncos	3	6	4
Detroit Lions	19	15	16
Green Bay Packers	1	7	3
Houston Texans	12	13	12
Indianapolis Colts	15	20	18
Jacksonville Jaguars	25	29	28
Kansas City Chiefs	28	27	29
Las Vegas Raiders	26	11	19
Los Angeles Chargers	16	17	15
Los Angeles Rams	32	32	32
Miami Dolphins	17	21	20
Minnesota Vikings	20	28	24
New England Patriots	5	1	2
New Orleans Saints	7	19	13
New York Giants	8	10	8
New York Jets	23	18	21
Philadelphia Eagles	9	4	6
Pittsburgh Steelers	11	2	5
San Francisco 49ers	4	12	7
Seattle Seahawks	13	8	11
Tampa Bay Buccaneers	30	26	30
Tennessee Titans	29	30	31
Washington Commanders	21	31	26

Additionally: Cardinals listed TWICE!

What Model to Use?



Method:
Linear Regression Model

Three Main Variables

Market Size

Stadium Factors

Branding

Additional Variables: Help test validity of hypothesis

Organizational Performance

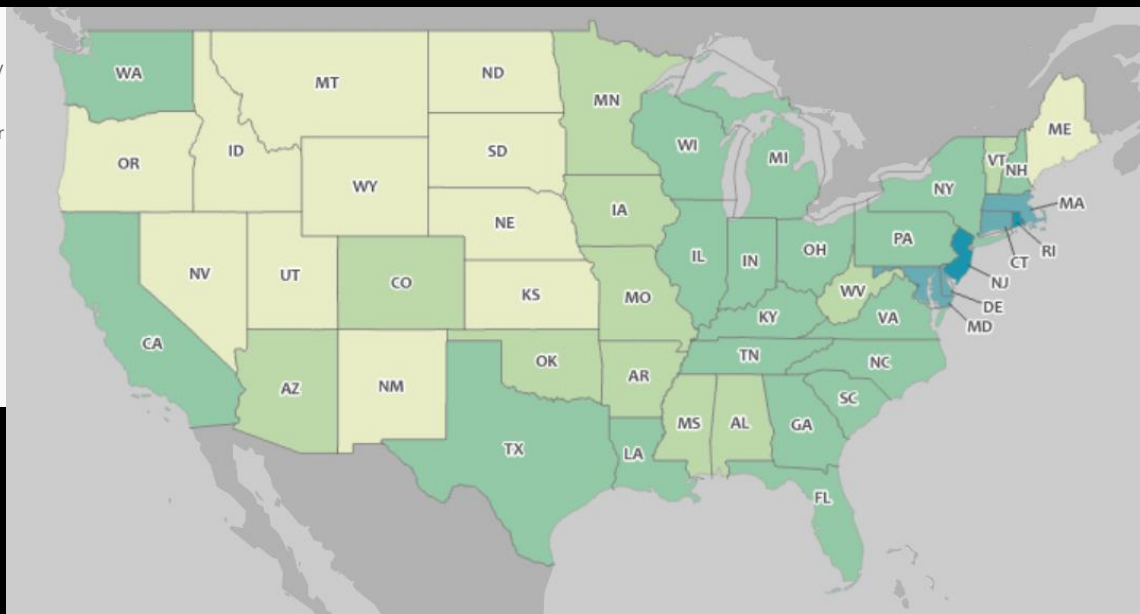
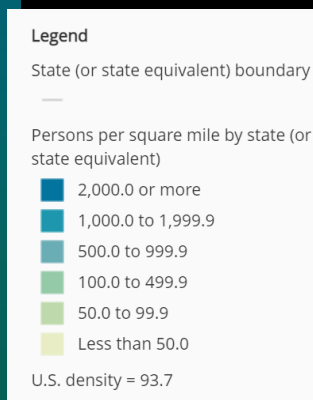
Team Finances

Market Size

Population Data:

- 2020 State Population (2020 Census)

Future: Look at regions with updated map and take populations (Use an updated map of course)



(2020 Population Map)

Team	StatePopulation(ESTBASE2020)
Arizona Cardinals	7151502
Atlanta Falcons	10711908
Baltimore Ravens	6177224
Buffalo Bills	20201249
Carolina Panthers	10439388
Chicago Bears	12812508
Cincinnati Bengals	11799448
Cleveland Browns	11799448
Dallas Cowboys	29145505
Denver Broncos	5773714
Detroit Lions	10077331
Green Bay Packers	5893718
Houston Texans	29145505
Indianapolis Colts	6785528
Jacksonville Jaguars	21538187
Kansas City Chiefs	6154913
Las Vegas Raiders	3104614
Los Angeles Chargers	39538223
Los Angeles Rams	39538223
Miami Dolphins	21538187
Minnesota Vikings	5706494
New England Patriots	7029917
New Orleans Saints	4657757
New York Giants	20201249
New York Jets	20201249
Philadelphia Eagles	13002700
Pittsburgh Steelers	13002700
San Francisco 49ers	39538223
Seattle Seahawks	7705281
Tampa Bay Buccaneers	21538187
Tennessee Titans	6910840
Washington Commanders	689545

Stadium Factors

- Overall Game Attendance (R.S.)
- Average Game Attendance
- Home Game Attendance
- Away Game Attendance
- Stadium Capacity
- Stadium Cost w/ Inflation

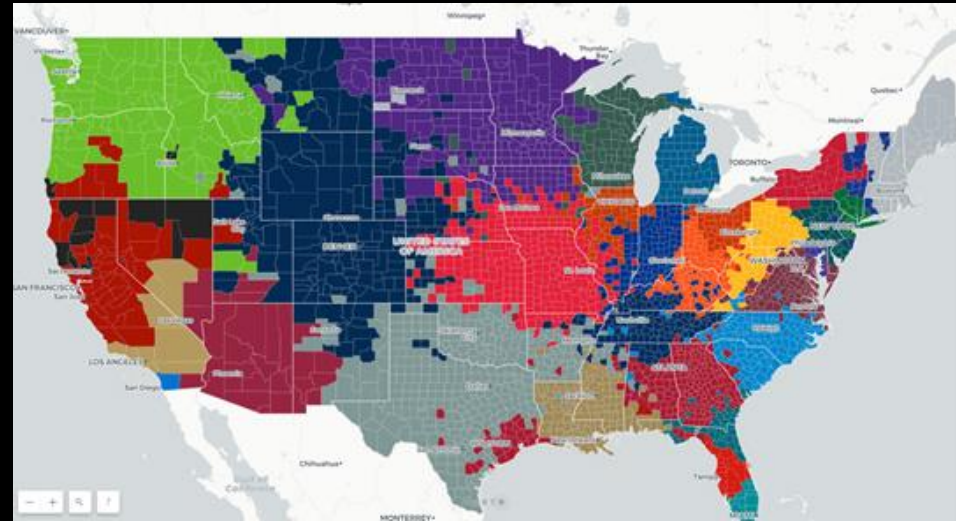
Team	Overall Attendance	Average Game Attendance	AVG Away Attendance	AVG Home Attendance	Cost of Stadium w/ Inflation	Stadium Capacity
Arizona Cardinals	1090961	93421	64174	62622	640331250	63400
Atlanta Falcons	1173908	77991	69053	67586	1736186357	71000
Baltimore Ravens	1141157	76236	67126	70537	382929570	71008
Buffalo Bills	1159638	73882	68214	67816	140580000	71608
Carolina Panthers	1202143	73227	70714	71906	437598929	74867
Chicago Bears	1079841	71906	63520	60834	925160869	61500
Cincinnati Bengals	1056115	71676	62124	60325	741418118	65515
Cleveland Browns	1160004	71598	68235	67431	493863385	67895
Dallas Cowboys	1366866	70537	80403	93421	1719194358	80000
Denver Broncos	1243881	70240	73169	76236	583461152	76125
Detroit Lions	1027002	69796	60411	51522	678142745	65000
Green Bay Packers	1187232	68566	69837	77991	9692788	81441
Houston Texans	1114558	68408	65562	66811	708107192	71795
Indianapolis Colts	1081420	67816	63612	62475	948781577	67000
Jacksonville Jaguars	1070491	67586	62970	59968	249461574	67264
Kansas City Chiefs	1192945	67431	70173	73227	291860956	76416
Las Vegas Raiders	1136163	66811	66833	61185	2082834191	65000
Los Angeles Chargers	1187786	66701	69869	71598	5371519757	70000
Los Angeles Rams	1153356	66670	67844	70240	5371519757	70000
Miami Dolphins	1110828	65878	65342	64374	287212500	65326
Minnesota Vikings	1118294	65372	65782	66701	1300327074	66200
New England Patriots	1150306	64929	67665	65878	512549749.9	65878
New Orleans Saints	1117104	64374	65712	64929	706653234	74295
New York Giants	1207895	62622	71052	73882	2081784496	82500
New York Jets	1173183	62475	69010	71676	2081784496	82500
Philadelphia Eagles	1177614	61185	69271	69796	798722217	67594
Pittsburgh Steelers	1103916	60834	64936	60488	450419186	68400
San Francisco 49ers	1109442	60488	65261	66670	1557983577	68500
Seattle Seahawks	1141021	60325	67118	68408	567747415	68740
Tampa Bay Buccaneers	1132824	59968	66636	65372	337674257	65890
Tennessee Titans	1137282	52751	66898	68566	493863385	69143
Washington Commanders	1081052	51522	63591	52751	441925233	79000

*Attendance numbers inflated because stadiums have additional general standing areas

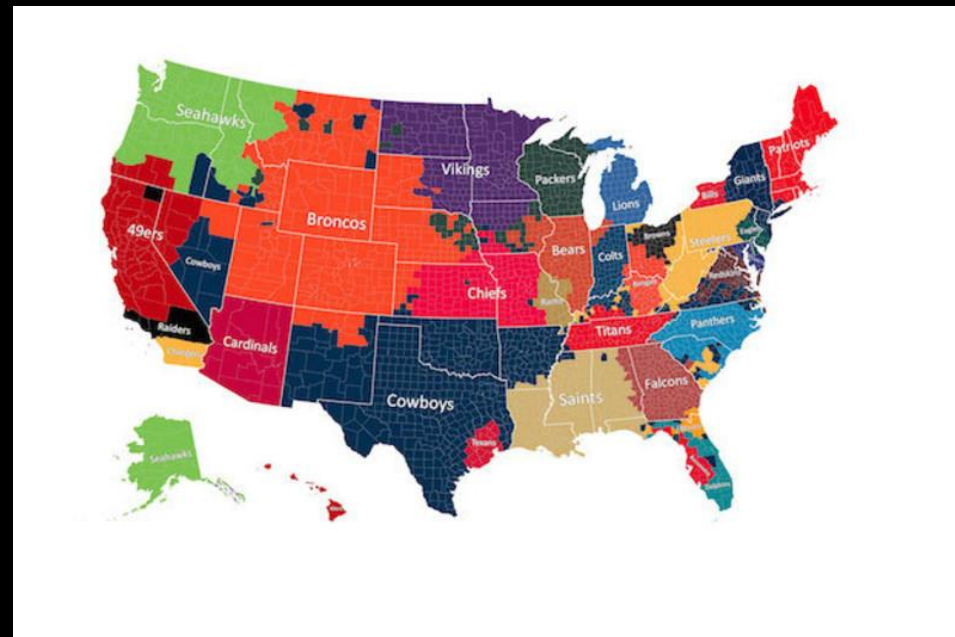
Branding

- Fan Equity Rank
- Team Social Rank
- Total Rank

TEAM	FAN EQUITY RANK	SOCIAL EQUITY RANK	TOTAL RANK
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PATRIOTS	5	1	2
PACKERS	1	7	3
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CARDINALS	32	32	32



(SeatGeek team with most bought tickets per county as of 2018)



(NFL team with highest number of Facebook likes as of 2014)

Additional Variables

Team Performance (Wikipedia)

- Regular season games played
- Regular season win percentage
- Playoff games played

Team	R.S. Games Played	R.S. Win Percentage	P.G Played
Arizona Cardinals	1395	0.428	17
Atlanta Falcons	865	0.438	24
Baltimore Ravens	417	0.56	27
Buffalo Bills	949	0.477	36
Carolina Panthers	433	0.475	17
Chicago Bears	1435	0.56	37
Cincinnati Bengals	837	0.449	23
Cleveland Browns	1019	0.49	33
Dallas Cowboys	947	0.571	64
Denver Broncos	949	0.527	42
Detroit Lions	1298	0.452	20
Green Bay Packers	1401	0.572	61
Houston Texans	321	0.433	10
Indianapolis Colts	1031	0.53	48
Jacksonville Jaguars	433	0.416	14
Kansas City Chiefs	949	0.541	38
Las Vegas Raiders	949	0.523	45
Los Angeles Chargers	949	0.499	30
Los Angeles Rams	1200	0.508	53
Miami Dolphins	865	0.553	41
Minnesota Vikings	935	0.544	51
New England Patriots	949	0.562	59
New Orleans Saints	851	0.468	23
New York Giants	1370	0.527	49
New York Jets	949	0.44	25
Philadelphia Eagles	1253	0.489	47
Pittsburgh Steelers	1237	0.536	63
San Francisco 49ers	1067	0.532	56
Seattle Seahawks	725	0.517	35
Tampa Bay Buccaneers	725	0.402	21
Tennessee Titans	949	0.491	39
Washington Commanders	1267	0.498	43

Team Finances (Forbes)

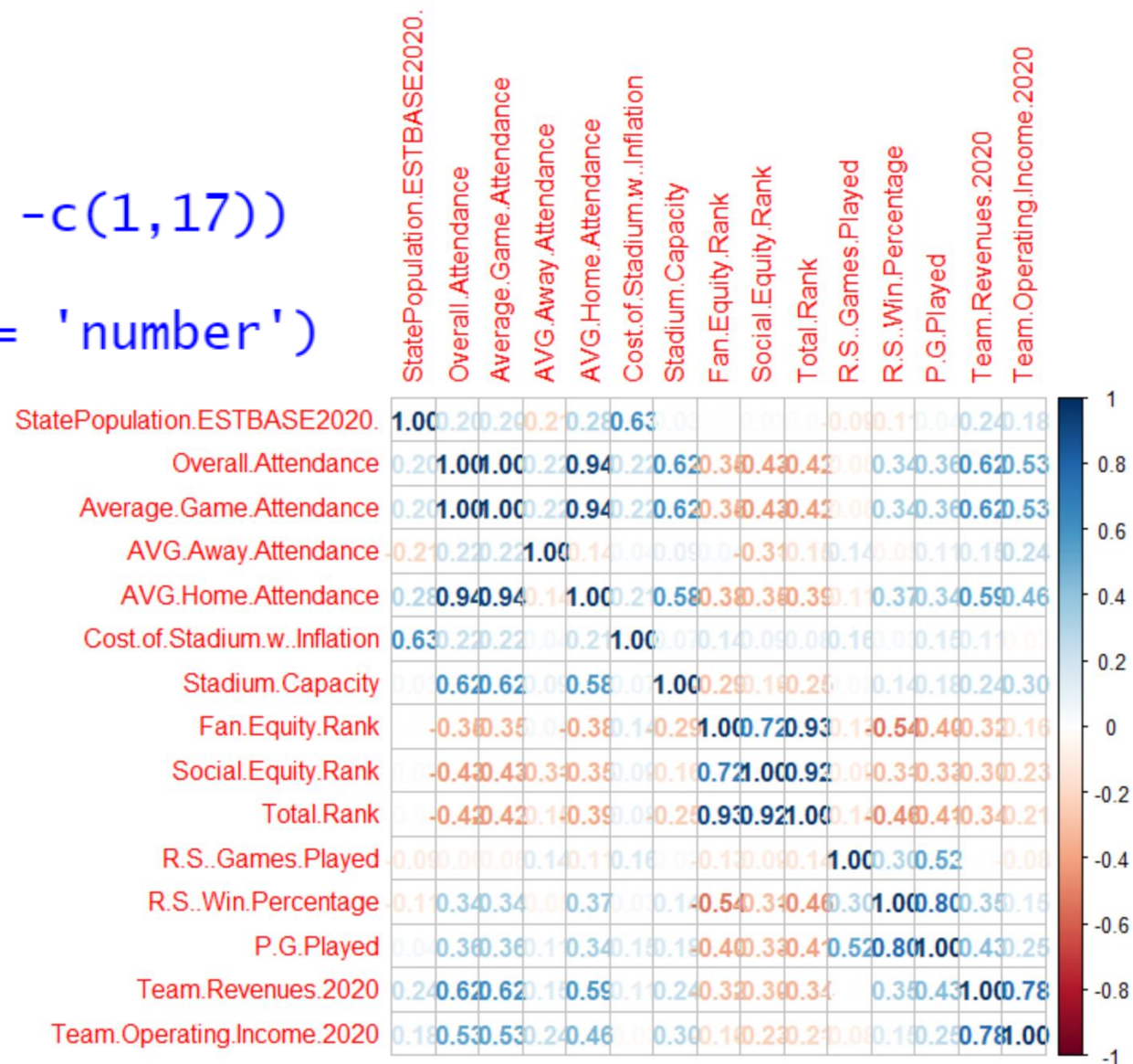
- Operating Income (2020)
- Team Revenues (2020)

Team	Team Revenues 2020	Team Operating Income 2020
Arizona Cardinals	800000000	-160000000
Atlanta Falcons	478000000	-40000000
Baltimore Ravens	350000000	-210000000
Buffalo Bills	422000000	-180000000
Carolina Panthers	388000000	-220000000
Chicago Bears	374000000	-360000000
Cincinnati Bengals	370000000	-170000000
Cleveland Browns	345000000	570000000
Dallas Cowboys	371000000	280000000
Denver Broncos	368000000	820000000
Detroit Lions	397000000	-220000000
Green Bay Packers	362000000	-340000000
Houston Texans	371000000	-200000000
Indianapolis Colts	364000000	-200000000
Jacksonville Jaguars	372000000	690000000
Kansas City Chiefs	389000000	900000000
Las Vegas Raiders	352000000	-510000000
Los Angeles Chargers	365000000	-490000000
Los Angeles Rams	350000000	370000000
Miami Dolphins	353000000	790000000
Minnesota Vikings	364000000	-970000000
New England Patriots	364000000	1420000000
New Orleans Saints	339000000	-160000000
New York Giants	351000000	-130000000
New York Jets	378000000	840000000
Philadelphia Eagles	361000000	-260000000
Pittsburgh Steelers	353000000	240000000
San Francisco 49ers	354000000	-450000000
Seattle Seahawks	375000000	-210000000
Tampa Bay Buccaneers	330000000	190000000
Tennessee Titans	348000000	-120000000
Washington Commanders	340000000	250000000

Correlation?

```
> NFLp<-subset(NFL,select = -c(1,17))
> corrNFL<-cor(NFLp[,])
> corrplot(corrNFL, method = 'number')
```

- Overall Attendance and Average Game Attendance
- Overall/Average Game Attendance and Average Home Attendance
- Total Rank and Fan/Social Equity Rank



ANOVA CHART

- Significant Variables
 - State Population*
 - Overall Attendance*
 - Fan Equity Rank*
 - Reg. Season Win %
 - Playoff Games Played
 - Team Revenues

* = Market Size, Stadium, and Branding Variables

```
> ModelALL.aov<- aov(NFL$Team.Valuation.2021.Forbes. ~ NFL$StatePopulation.ES
TBASE2020. + NFL$Overall.Attendance + NFL$Average.Game.Attendance + NFL$AVG.A
way.Attendance + NFL$AVG.Home.Attendance + NFL$Cost.of.Stadium.w..Inflation +
NFL$Stadium.Capacity + NFL$Fan.Equity.Rank + NFL$Social.Equity.Rank + NFL$To
tal.Rank + NFL$R.S..Games.Played + NFL$R.S..Win.Percentage + NFL$P.G.Played +
NFL$Team.Revenues.2020 + NFL$Team.Operating.Income.2020, data = NFL)
> summary(ModelALL.aov)
```

[illegible]

Model 1: ALL THE VARIABLES

ADJUSTED R-SQUARED = 0.7418

- Not great but not terrible
- Hopefully can find ways to improve

```
Call:
lm(formula = NFL$Team.Valuation.2021.Forbes. ~ NFL$StatePopulation.ESTBASE2020. +
    NFL$Overall.Attendance + NFL$Average.Game.Attendance + NFL$AVG.Away.Attendance +
    NFL$AVG.Home.Attendance + NFL$Cost.of.Stadium.w..Inflation +
    NFL$Stadium.Capacity + NFL$Fan.Equity.Rank + NFL$Social.Equity.Rank +
    NFL$Total.Rank + NFL$R.S..Games.Played + NFL$R.S..Win.Percentage +
    NFL$P.G.Played + NFL$Team.Revenues.2020 + NFL$Team.Operating.Income.2020)
```

Residuals:

	Min	1Q	Median	3Q	Max
	-779772972	-185252257	-18393010	208951885	953919501

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	3.131e+09	4.107e+09	0.762	0.45694
NFL\$StatePopulation.ESTBASE2020.	1.022e+01	1.286e+01	0.795	0.43852
NFL\$Overall.Attendance	-1.280e+07	1.756e+07	-0.729	0.47652
NFL\$Average.Game.Attendance	2.187e+08	2.987e+08	0.732	0.47463
NFL\$AVG.Away.Attendance	-5.800e+05	2.995e+05	-1.936	0.07068 .
NFL\$AVG.Home.Attendance	-5.722e+05	2.795e+05	-2.047	0.05744 .
NFL\$Cost.of.Stadium.w..Inflation	2.957e-01	1.157e-01	2.556	0.02115 *
NFL\$Stadium.Capacity	4.944e+04	2.365e+04	2.090	0.05291 .
NFL\$Fan.Equity.Rank	-2.481e+08	1.096e+08	-2.265	0.03776 *
NFL\$Social.Equity.Rank	-2.494e+08	1.113e+08	-2.241	0.03954 *
NFL\$Total.Rank	4.299e+08	2.010e+08	2.139	0.04820 *
NFL\$R.S..Games.Played	-1.391e+05	4.019e+05	-0.346	0.73377
NFL\$R.S..Win.Percentage	9.260e+08	3.858e+09	0.240	0.81338
NFL\$P.G.Played	2.109e+07	1.302e+07	1.620	0.12475
NFL\$Team.Revenues.2020	7.489e+00	2.273e+00	3.295	0.00457 **
NFL\$Team.Operating.Income.2020	1.174e+00	2.303e+00	0.510	0.61726

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 4.61e+08 on 16 degrees of freedom
Multiple R-squared: 0.8667, Adjusted R-squared: 0.7418
F-statistic: 6.938 on 15 and 16 DF, p-value: 0.0001953

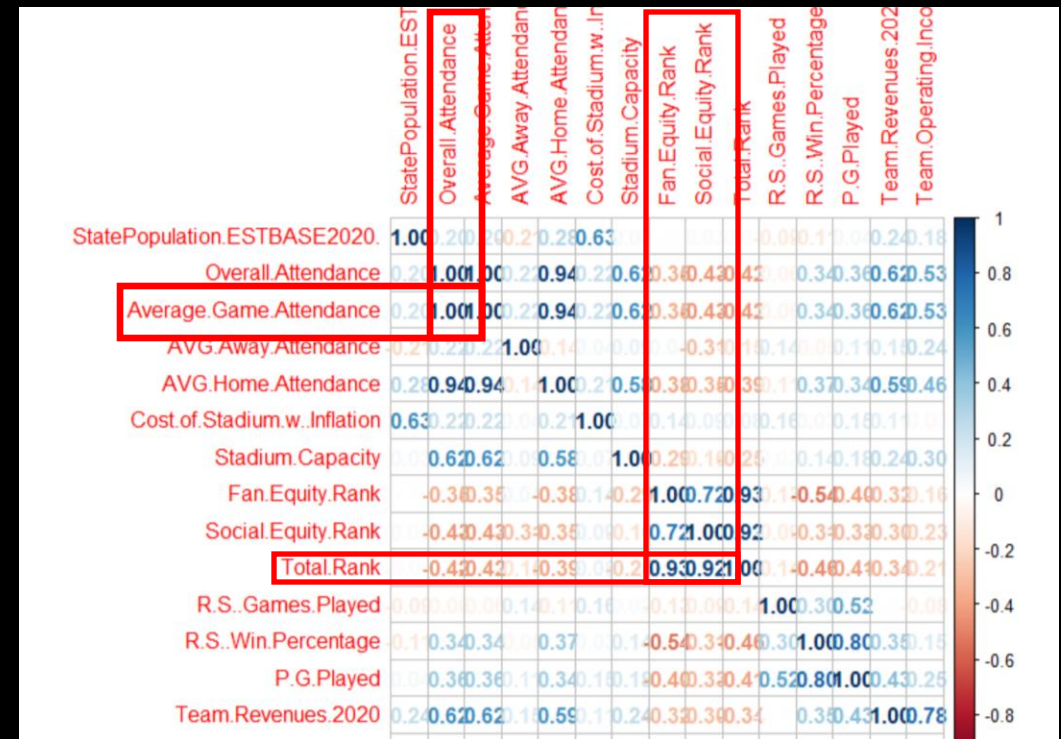
```
w..Inflation +
NFL$Stadium.Capacity + NFL$Fan.Equity.Rank + NFL$Social.Equity.Rank +
NFL$R.S..Games.Played + NFL$R.S..Win.Percentage + NFL$P.G.Played +
NFL$Team.Revenues.2020 + NFL$Team.Operating.Income.2020)
```

```
Residuals:
    Min       1Q   Median       3Q      Max
-918276666 -275160532  70100554  323769514  760267758
```

```
Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)  1.596e+09  4.551e+09  0.351  0.7297
NFL$StatePopulation.ESTBASE2020.  2.404e+00  1.412e+01  0.170  0.8667
NFL$Overall.Attendance -3.345e+03  2.854e+03 -1.172  0.2558
NFL$AVG.Away.Attendance  1.440e+04  4.537e+04  0.317  0.7544
NFL$Cost.of.Stadium.w..Inflation  2.112e-01  1.176e-01  1.796  0.0884
NFL$Stadium.Capacity  3.364e+04  2.443e+04  1.377  0.1845
NFL$Fan.Equity.Rank -2.930e+07  2.049e+07 -1.430  0.1691
NFL$Social.Equity.Rank  2.302e+06  1.871e+07  0.123  0.9034
NFL$R.S..Games.Played -7.275e+04  4.362e+05 -0.167  0.8693
NFL$R.S..Win.Percentage  5.479e+08  4.263e+09  0.129  0.8991
NFL$P.G.Played  1.483e+07  1.381e+07  1.074  0.2963
NFL$Team.Revenues.2020  4.614e+00  2.272e+00  2.031  0.0565
NFL$Team.Operating.Income.2020  2.803e+00  2.413e+00  1.161  0.2599
```

```
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
Residual standard error: 519700000 on 19 degrees of freedom
Multiple R-squared:  0.7989, Adjusted R-squared:  0.6719
```



MODEL 2: Removed the highly correlated

Adjusted R-Squared = 0.6719

Variables Removed:

Average game attendance

Redundant as equal to Overall Attendance/17(# of games played)

Total Rank

Just an average of other two rank variables

Model 3: Only Significant Variables

- Variables Included:

- State Population
- Overall Attendance
- Fan Equity Rank
- Win Percentage (R.S.)
- Playoff Games Played
- Team Revenues

- ADJUSTED R-SQUARED = 0.6512**

```
> ModelALL.aov<- aov(NFL$Team.Valuation.2021.Forbes. ~ NFL$StatePopulation.ES
TBASE2020. + NFL$Overall.Attendance + NFL$Average.Game.Attendance + NFL$AVG.A
way.Attendance + NFL$AVG.Home.Attendance + NFL$Cost.of.Stadium.w..Inflation +
NFL$Stadium.Capacity + NFL$Fan.Equity.Rank + NFL$Social.Equity.Rank + NFL$To
tal.Rank + NFL$R.S..Games.Played + NFL$R.S..Win.Percentage + NFL$P.G.Played +
NFL$Team.Revenues.2020 + NFL$Team.Operating.Income.2020, data = NFL)
> summary(ModelALL.aov)
```

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
NFL\$StatePopulation.ESBASE2020.	1	2.480e+18	2.480e+18	11.669	0.003539 **
NFL\$Overall.Attendance	1	6.224e+18	6.224e+18	29.285	5.76e-05 ***
NFL\$Average.Game.Attendance	1	1.876e+16	1.876e+16	0.088	0.770234
NFL\$AVG.Away.Attendance	1	1.189e+17	1.189e+17	0.559	0.465375
NFL\$AVG.Home.Attendance	1	3.562e+16	3.562e+16	0.168	0.687702
NFL\$Cost.of.Stadium.w..Inflation	1	1.581e+17	1.581e+17	0.744	0.401231
NFL\$Stadium.Capacity	1	3.618e+17	3.618e+17	1.702	0.210479
NFL\$Fan.Equity.Rank	1	3.554e+18	3.554e+18	16.719	0.000856 ***
NFL\$Social.Equity.Rank	1	3.912e+17	3.912e+17	1.840	0.193740
NFL\$Total.Rank	1	1.386e+16	1.386e+16	0.065	0.801683
NFL\$R.S..Games.Played	1	5.006e+17	5.006e+17	2.355	0.144383
NFL\$R.S..Win.Percentage	1	1.163e+18	1.163e+18	5.471	0.032640 *
NFL\$P.G.Played	1	1.389e+18	1.389e+18	6.536	0.021122 *
NFL\$Team.Revenues.2020	1	5.655e+18	5.655e+18	26.607	9.53e-05 ***
NFL\$Team.Operating.Income.2020	1	5.521e+16	5.521e+16	0.260	0.617256
Residuals	16	3.401e+18	2.125e+17		

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```
Call:
lm(formula = NFL$Team.Valuation.2021.Forbes. ~ NFL$StatePopulation.ESBASE2020.
+
  NFL$Overall.Attendance + NFL$Fan.Equity.Rank + NFL$R.S..Win.Percentage +
  NFL$P.G.Played + NFL$Team.Revenues.2020)
```

Residuals:

Min	1Q	Median	3Q	Max
-946127463	-343145426	-62483364	209564333	1035471303

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	5.346e+08	2.563e+09	0.209	0.83647
NFL\$StatePopulation.ESBASE2020.	1.489e+01	9.458e+00	1.574	0.12800
NFL\$Overall.Attendance	4.000e+02	1.996e+03	0.200	0.84281
NFL\$Fan.Equity.Rank	-2.137e+07	1.259e+07	-1.697	0.10203
NFL\$R.S..Win.Percentage	-2.032e+08	3.684e+09	-0.055	0.95644
NFL\$P.G.Played	1.817e+07	1.104e+07	1.646	0.11233
NFL\$Team.Revenues.2020	5.382e+00	1.603e+00	3.357	0.00252

(Intercept)
NFL\$StatePopulation.ESBASE2020.
NFL\$Overall.Attendance
NFL\$Fan.Equity.Rank
NFL\$R.S..Win.Percentage
NFL\$P.G.Played
NFL\$Team.Revenues.2020 **

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 535800000 on 25 degrees of freedom
Multiple R-squared: 0.7187, Adjusted R-squared: 0.6512
F-statistic: 10.65 on 6 and 25 DF, p-value: 6.97e-06

So the WINNER is...

- **MODEL 3: Only Significant Variables**

- ADJUSTED R-SQUARED = 0.6512
- Takeaways:
 - Wish I could have improved adjusted R-squared
 - While adjusted R-squared was higher on other models was able to reduce dimensionality
 - Reduced likelihood of overfitting

```
Call:
lm(formula = NFL$Team.Valuation.2021.Forbes. ~ NFL$StatePopulation.ESTBASE2020. +
  NFL$Overall.Attendance + NFL$Fan.Equity.Rank + NFL$R.S..Win.Percentage +
  NFL$P.G.Played + NFL$Team.Revenues.2020)

Residuals:
    Min       1Q   Median       3Q      Max
-946127463 -343145426 -62483364  209564333 1035471303

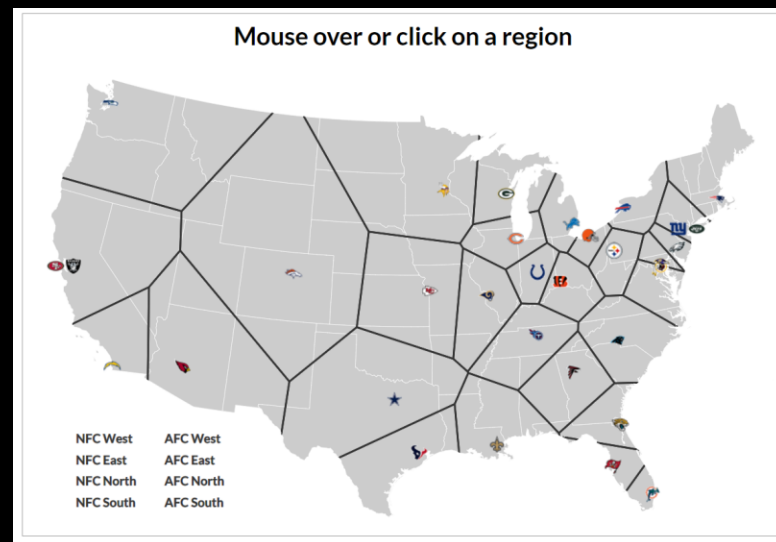
Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)    5.346e+08  2.563e+09   0.209  0.83647
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(Intercept)
NFL$StatePopulation.ESTBASE2020.
NFL$Overall.Attendance
NFL$Fan.Equity.Rank
NFL$R.S..Win.Percentage
NFL$P.G.Played
NFL$Team.Revenues.2020      **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

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Multiple R-squared:  0.7187,    Adjusted R-squared:  0.6512
F-statistic: 10.65 on 6 and 25 DF,  p-value: 6.97e-06
```


For the Future:

- Better population data to help better gauge market size
 - Include missing states and divide team by region (Using an updated NFL Map)
- Stadium Revenue Data
 - Stadium worth as an asset that influences team valuation?
- Adjust for Weird Values in Data
 - Packers Stadium Cost
 - Rams Branding Rank
 - Cowboys a major outlier
- Find better way to rank branding
- Scale the Data
- Did not train the data (Small Sample Size)



(Noah Veltman)

Works Cited

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