

The Betting Market as a Forecast of Television Ratings for Primetime NFL Football

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Abstract

Television ratings for Sunday and Monday night NFL football are examined using betting market prices as explanatory variables. Primetime broadcasts are shown to respond positively to the win percentages of the teams playing and the expected amount of scoring measured by the betting market total. The point spread, measuring uncertainty of outcome, is found to have a negative, but insignificant effect on ratings. Betting market volume is shown to be influenced by the same factors as ratings, and the residuals of betting volume, known before the game is played, is shown to have a positive and significant effect on ratings.

Keywords: television ratings, NFL, football, betting markets

Introduction

Sports broadcasts offer one of the only remaining items consumers of televised programs demand to view live. In a media world increasingly dominated by programs recorded to DVRs and subscription services such as Netflix, sports offers television advertisers an audience that demands to watch a program as it unfolds in real time. Other forms of entertainment, such as television shows and movies, are not as time-dependent as technology allows for consumers to watch these events at a time that is convenient for them. Sports remains different as the real-time experience is important to fans who follow their favorite teams, participate in fantasy leagues, and wager on the outcome of games.

With this in mind, sports offers a captive audience to advertisers as fans will not be able to fast-forward through commercials as they watch the game as it actually happens. Television contracts for popular sports have skyrocketed in recent years and

advertisers are willing to pay high prices to expose their product to consumers who watch live sports. In the United States, the top sport for viewers and fans alike is the National Football League (NFL), whose season runs through the fall and winter months. Even with its popularity, however, not all NFL games are created equal. Televised games featuring different teams and game conditions are likely to attract dissimilar levels of fan demand for viewing the game.

Understanding the factors that lead to higher ratings for NFL games is important on a variety of fronts. First, the league has primetime contracts with NBC and ESPN (Disney/ABC) for Sunday and Monday night games where only a single NFL game is shown at that time slot. This is quite different from the normal Sunday afternoon games, where multiple games are being played simultaneously. The networks would like to choose the highest-quality games for primetime broadcasts to maximize viewership and revenues from advertisers.

A second factor that is quite important for NFL broadcasts is that advertisers are typically guaranteed a certain Nielsen rating or they will receive future advertising as compensation. This agreement is called a “make good” and is discussed in the advertising literature in research such as Rust et al. (1992). If the game does not meet its ratings goal, the network loses out on future revenues. Understanding the factors that drive television ratings is pivotal to choosing games to broadcast, deciding how much advance advertising to allot to the game, and as a result capture the highest revenues from advertisers.

Third, understanding the game attributes that lead to higher television ratings is useful to the league as a whole when they sell future television packages to the networks. If factors such as game uncertainty and scoring play pivotal roles in driving television audiences, structure of the sport itself could potentially be adjusted, such as rules aimed at increasing scoring, to maximize the value of future television deals.

This paper addresses these issues by studying the factors that affect Nielsen ratings for primetime NFL games on Sunday and Monday nights. Regression models are developed and tested that use expected game attributes formed in the betting market for National Football League games as independent variables. The point spread, a measure of uncertainty of outcome, and the total, a measure of expected scoring, and other factors are used to explain three different measures of television viewership available publicly in *Variety* magazine: the overall Nielsen rating for the game, the Nielsen rating of the 18–49 year-old viewership bracket, and the share of the rating of the 18–49 year-old group.

The overall Nielsen rating is important to networks and advertisers and its determinants are the main focus of this study. The 18–49 year-old group, however, is an interesting and timely subset because attracting and retaining viewers of this age group has recently been revealed as a problem for the NFL. Although the NFL is a television ratings giant, the average age of its viewers has been trending older. *Variety* magazine, the source of the data for this research, noted that the average audience size for NFL games has declined by more than 10% in the last four years and this trend has become a major concern for the league as a whole (Steinberg, 2014). Understanding the factors that influence viewership among this group, both as a whole and as a share of televisions in use, should be helpful to the league in retaining and improving this segment

of the audience, which is often identified as valuable to advertisers due to their disposable income and consumption habits (i.e., Storey, 2009).

Additionally, we illustrate how the same factors that influence television ratings also mirror the amount of interest on a game in the betting market through a regression model of betting volume taken from www.sportsinsights.com. Illustrating that bettors and viewers (fans) of the NFL respond similarly to the game attributes is advantageous as the betting market for the game is formed before the game is played and may ultimately be useful in helping to forecast television demand. We note this by adding the unexplained portion of the betting volume regression, the residuals, as an independent variable in the Nielsen ratings regressions. These residuals capture factors that may be difficult to actually model, but due to the ex-ante betting market being influenced by the same factors as the ex-post television viewership market, will help to provide insight into which games are likely to be more or less popular than originally anticipated. Through this information, television networks may be better able to plan to meet ratings goals for advertisers and maximize their profits.

Literature Review

The role of uncertainty of outcome, team quality, and television ratings have been studied for the NFL and other sports in the sport economics literature. In relation to the NFL, Paul and Weinbach (2007) found that higher quality teams, measured by the sum of win percentages of the teams, led to higher start-of-game ratings for Monday Night Football and kept more of the audience at halftime of the game. Closer games at halftime were also shown to retain a higher rating than games that were lopsided. Tainsky (2010) also found that teams with higher win percentages had higher television ratings across all televised games in the NFL. In addition, Tainsky and McEvoy (2012) showed that better quality teams improved ratings, while uneven matchups led to lower overall ratings. Game uncertainty was also shown to play a major role in television ratings for out-of-market NFL playoff games, but not for local television markets containing playoff teams (Tainsky, Xu, & Zhou, 2014). Grimshaw and Burwell (2014) found that fans prefer close games (more uncertainty of outcome) in NFL markets without local teams and showed that NFL games on competing networks are substitutes for one another in viewership.

Television ratings for other sports have also been tested for the role of uncertainty of outcome and other factors. In college football bowl games, Salaga and Tainsky (2014) found that less uncertainty of outcome appeared favorable, pre-game, for BCS bowl games, but within-game analysis found that viewers respond positively to game uncertainty. In the NBA, Mongeon and Winfree (2012) found that television audiences were more sensitive to win percentages of teams than in-person game attendance. Also for the NBA, Hausman and Leonard (1997) showed that star players increased television ratings. The role of race and TV ratings were explored in both the NBA (Kanazawa & Funk, 2011) and the NFL (Aldrich et al., 2005). For NASCAR racing, greater uncertainty of outcome was also shown to positively impact television ratings, in addition to live attendance (Berkowitz et al., 2011).

The role of uncertainty of outcome was also studied for various television markets in Europe. Forrest, Simmons, and Buraimo (2005) found that English Premier League (EPL) ratings were positively influenced by uncertainty of outcome and also discov-

ered that more uncertainty of outcome also influenced the selection of games during the flexible portion of the EPL schedule. When EPL matches were broken down into minute-by-minute television ratings, uncertainty of outcome was also shown to positively and significantly affect TV ratings (Alavy et al., 2010). Greater uncertainty of outcome was also shown to have a positive effect on television ratings for Spanish Football (Buraimo & Simmons, 2009).

Expected scoring, proxied by the total (over/under) on sports contests, have also been shown to have a positive and significant effect on TV ratings. Paul and Weinbach (2007) showed that expected scoring played an important role in NFL Nielsen ratings for Monday Night Football. More recently, Grimshaw and Burwell (2014) showed that non-local market NFL viewers preferred high scoring games to low scoring games.

In relation to another key component of this study, betting volume has recently become available for study to researchers. Paul and Weinbach (2013) illustrated that betting volume is influenced by televised games, higher quality team matchups, and higher expected scoring for the NFL. Similar findings were also shown for betting volume for other sports in North America (Paul & Weinbach, 2010). In addition, Paul, Weinbach, and Small (2014) noted the role that betting volume plays in the study and findings of market efficiency in betting markets.

This research extends the literature on this subject to examine the relationship between television ratings and betting volume. This paper illustrates common factors that influence both television ratings and betting volume, investigates changes over time in these variables, and reveals how the unexplained variation in betting volume, known before a game is played, helps to account for variations in television ratings.

Regression Models

To study this market, we estimate four regression models using factors from the betting market and elsewhere to explain differences in different forms of television ratings and betting volume. The dependent variables in the four regression models consist of three measures of television viewership and one measure of betting market participation. The three measures of television viewership are overall Nielsen rating, 18–49 year-old Nielsen rating, and 18–49 year-old Nielsen share of rating. A Nielsen rating point is equal to one percent of the total number of television households in the United States. For the year 2014, this is approximately equal to 1,156,000 households. Nielsen share of ratings is calculated for a particular time slot as the number of household televisions tuned to the program divided by the number of televisions in use, expressed as a percentage. As stated in the introduction, the overall ratings are the prime focus of this research, but the 18–49 year-old audience is also studied due to estimated declining interest in NFL viewership among this demographic and their appeal to advertisers due to their disposable income and consumption habits.

Each of these measures are taken from *Variety* magazine for the 2009–2013 NFL seasons. We use each game reported by *Variety* magazine during this timeframe as our sample. The measure of betting market activity is betting volume taken from www.sportsinsights.com daily during the timeframe of this sample. The betting volume is taken from the number of bets for each game offered on the sports betting rotation. Sportsinsights presents an aggregated total of bets from three popular on-line sportsbooks, BetUS.com, CaribSports.com, and SportBet.com. The average number of

bets per game was nearly 90,000 for the sample. This figure is not the number of dollars bet, as that information is not given by Sportsinsights, but research into the relationship between the number of bets and dollars bet revealed an extremely high degree of correlation between these numbers (Humphreys et al., 2013).

The independent variables included in each of the regressions are structured the same across all four models. The first set of independent variables includes NFL football game attributes. The first independent variable is the sum of the win percentages of the teams participating in the nationally televised game. The win percentages used in this summation are the win percentages going into the game for each team. This variable represents the overall quality of the teams participating in the game. Assuming fans prefer games between the best teams, this variable should have a positive impact on television ratings.

The second independent variable included in the model is the absolute value of the point spread on the game taken from www.sportsinsights.com. This serves as the measure of uncertainty of outcome of the game. The absolute value of the point spread is used due to the home field advantage not being important in the setting of understanding how uncertainty of outcome impacts television ratings. Point spreads closer to zero indicate games that are expected to be more competitive; if uncertainty of outcome is important, this variable should have a negative and significant effect on Nielsen ratings.

The betting market total, also gathered from www.sportsinsights.com, is another independent variable that represents on-field expectations of game play; in this case the total (over/under) represents expected scoring in the game. Given previous research results (Paul & Weinbach, 2007), the expected sign on this variable is positive as higher scoring games are expected to be more popular with fans of the game.

Given that the sample contains both primetime NFL games on Sunday and Monday nights, a dummy variable is included in the regression model for Sunday Night Football games on NBC. Sunday night games are available for free over-the-air (in addition to cable and satellite subscribers), while ESPN's Monday Night Football is only available through a paid cable or satellite subscription. Therefore, given a wider potential audience for primetime football on Sunday night, the dummy variable for Sunday Night Football should have a positive and significant effect on ratings and volume.

The regression model also includes dummies for the months of the season and years within the sample. The months of the season should account for changing interest in football throughout the season due to the playoff push, some teams being eliminated from playoff contentions, starting or ending of other sports, and holiday effects. The yearly dummies are included to take into account changing technology throughout the sample as more households have obtained alternative ways to watch television programming (mobile devices, computers, etc.) and other entertainment viewing options have multiplied (i.e., Netflix). The yearly dummies are also important for the betting volume regression, as government rules were introduced that prohibited the funding of offshore betting accounts from U.S. banks and credit cards.

A dummy variable is also included in the regression model to account for primetime NFL games that directly competed with Major League Baseball World Series games. On the days where the two sports went head-to-head, the value of this dummy variable is one. Past research has shown that the two products are substitutes for viewers

Table 1: Summary Statistics – 2009–2013 Sunday Night Football and Monday Night Football

	18–49 Rating	18–49 Share	Overall Rating	Betting Volume	Point Spread	Total
<i>n=133</i>		<i>Overall</i>	<i>Sample</i>			
Mean	6.85	18.58	17.75	88,276.11	5.19	45.12
Median	6.80	18.00	17.31	87,149.00	4.00	45.00
Standard Deviation	1.65	10.73	4.54	18,178.67	3.39	4.74
<i>n=73</i>		<i>Sunday</i>	<i>Night</i>	<i>Football</i>		
Mean	7.88	19.73	20.65	91,089.95	4.59	45.84
Median	7.80	19.00	20.86	87,149.00	3.50	46.50
Standard Deviation	1.29	3.40	3.59	18,648.88	2.99	4.74
<i>n=60</i>		<i>Monday</i>	<i>Night</i>	<i>Football</i>		
Mean	5.61	17.18	14.23	84,852.60	5.92	44.26
Median	5.60	15.00	13.99	87,149.00	4.75	44.50
Standard	1.08	15.48	2.72	17,125.95	3.72	4.64

(Paul & Weinbach, 2007). If this has continued in recent years, this dummy variable should have a negative and significant effect on NFL TV ratings.

Summary statistics of the data used in the regression model are presented in Table 1. As can be seen in the table, Sunday Night Football ratings and betting volumes are higher overall than Monday Night Football. Sunday Night Football games also have greater uncertainty of outcome (lower absolute value of the points spread) and scoring (total).

Table 2 presents the regression results for each of the four models, showing results for overall Nielsen ratings, 18–49 year-old Nielsen ratings, 18–49 year-old Nielsen share, and Betting Volume. Coefficients are presented for each independent variable, t-stats are shown in parentheses, and statistical significance is noted with *-notation. Due to autocorrelation and heteroskedasticity issues with the data, Newey-West HAC standard errors and covariances are used and shown in the regression results below.

Across the four regression model results, there are clear similarities in the factors that influence television ratings and betting volume in the NFL. First, in terms of game attributes, it was found that the sum of win percentages of the teams was found to have a positive and significant effect on TV ratings and betting volume in each regression model. More successful teams increase fan and bettor demand to watch and wager on primetime games.

Our measure of uncertainty of outcome of the game, the absolute value of the point spread, was not found to have a statistically significant effect on television ratings or betting volume. It appears the overall quality of the teams participating in the game and other factors are more important to viewers and bettors than uncertainty of outcome when there is only one game being broadcast in primetime. In addition, due to the selection process by NBC and ESPN, these games are often chosen with the anticipation of a close football game. When only studying primetime games, the variation in uncertainty of outcome may not be large enough, especially in a limited sample, to fully capture fan preferences for uncertainty of outcome.

Table 2: TV Ratings and Betting Volume Regression Results –

NFL 2009-2013 Sunday Night and Monday Night Football				
Dependent Variable:	Overall Nielsen Rating	18–49 Nielsen Rating	18–49 Nielsen Share of Rating	Betting Volume
Intercept	4.63 (1.62)	2.23** (2.10)	7.08*** (2.87)	54768.55*** (3.52)
Sum of Win Percentages _{t-1}	2.11*** (2.82)	0.75*** (3.76)	1.67*** (3.07)	7156.887** (2.38)
Absolute Value of Point Spread	-0.07 (-0.77)	-0.01 (-0.61)	0.01 (0.02)	-105.65 (-0.27)
Betting Market Total	0.18*** (2.95)	0.07*** (3.02)	0.19*** (3.51)	587.33 (1.84)
Sunday Night Football	6.16*** (11.19)	2.18*** (8.06)	4.32*** (6.56)	5620.04** (1.99)
October	-0.98 (-1.29)	-0.62** (-2.36)	-2.54*** (-3.48)	5185.64 (1.15)
November	-0.66 (-0.88)	-0.63*** (-2.78)	-2.67*** (-4.01)	1465.95 (0.45)
December	0.12 (0.15)	-0.59 (-2.09)	-2.26*** (-3.02)	-6184.37 (-1.58)
January	1.44 (0.63)	-0.22 (-0.20)	-1.97 (-0.71)	3394.97 (0.38)
2010	1.04 (1.20)	0.26 (-0.96)	0.86 (1.15)	12912.68** (2.20)
2011	0.18 (0.21)	0.06 (0.17)	-0.59 (-0.65)	-12393.10*** (-2.99)
2012	-0.15 (-0.18)	-0.07 (-0.21)	-0.23 (-0.27)	-6692.44 (-1.66)
2013	-1.09 (-0.18)	-0.70** (-2.13)	-2.00** (-2.39)	-17201.47*** (-3.50)
World Series Dummy Variable	-2.70** (-2.00)	-1.29*** (-3.96)	-3.56*** (-5.58)	-4361.20 (-0.67)
R-squared	0.61	0.64	0.59	0.40

*-notation notes statistical significance of the t-test that the coefficient is different from zero. ** represents statistical significance at the 5% level and *** represents statistical significance at the 1% level.

Another possibility to explain the lack of statistical significance of the absolute value of the point spread is that this measure of outcome uncertainty may be related to other factors that affect demand for live games, such as loss aversion, home win preference, and a preference for watching upsets (Coates et al., 2014). Although studied in the context of attendance, these same factors may also impact television demand. In related work, Humphreys and Zhou (2014) note that as many as four different factors can be captured in the observed relationship between outcome uncertainty and consumer demand. Therefore, an identification problem may lead to an imprecise parameter estimate on outcome uncertainty. More research into this area may help to clarify these results as it relates to demand for sports on television.

Expected scoring, proxied by the betting market total on the game, was found to have a positive and significant effect on television ratings, similar to the findings of Paul and Weinbach (2007). All else equal, having an anticipated higher scoring game led to increases in overall television ratings, ratings among 18–49 year olds, and the share of the ratings for 18–49 year olds.

The dummy variable for Sunday Night Football games on NBC, as opposed to Monday Night Football games on ESPN, was shown to have a positive impact on television ratings and betting volume. Due to Sunday Night Football being available over-the-air and Monday Night Football being only available on cable and satellite, the greater potential audience leads to more viewers overall. Under the assumption that there is a sizeable consumption component to sports betting, having a game available to a larger audience on NBC likely leads to more bettors as they can easily watch the game and enjoy following the successes and failures of the teams (and their bets) throughout the telecast.

The regression model results show that there were monthly effects on the ratings share of 18–49 year olds, as ratings share of NFL games fell in October, November, and December (compared to September) for this age group. Perhaps after the start of the season, as some teams drop from contention, some of the younger audience changes their viewing to other forms of entertainment or simply does not watch television during these telecasts. Statistically significant monthly effects were not evident in the other regression results.

Yearly dummies played an important role in betting volume for Sunday and Monday night NFL games, as betting volume has declined over time. This is likely due to tighter internet restrictions on banks, credit cards, and other funding mechanisms for offshore sports books under U.S. law. These restrictions have led U.S. bettors to move away from offshore gambling, potentially into other similar markets such as one-day fantasy sports leagues, which were deemed legal under U.S. law. Yearly dummies were generally shown to not have an impact on television ratings, with the exception being the 2013 season for the ratings share of 18–49 year olds. This declining younger audience, specifically males, was the subject of much discussion in the media during the early 2014 NFL season. Although declining ratings for the NFL within this age group is evident, this may not reflect fewer fans in this demographic watching football games, but could indicate they are watching games through mobile devices or the internet, which the Nielsen ratings may not capture.

The dummy variable representing when the NFL was up against Major League Baseball's World Series during primetime broadcasts was shown to have a negative and

significant effect on overall Nielsen ratings, 18–49 ratings, and 18–49 ratings share. The final series of the Major League Baseball playoffs appears to be a substitute for NFL games, as baseball's champion is determined during the second month of the NFL season. In contrast, betting volume for NFL primetime games was not impacted in a statistically significant matter by the World Series.

Overall, the regression results show that television viewers and bettors both value many of the same attributes when making the decision to watch/wager on NFL games. They prefer games between good teams, individual game uncertainty of outcome does not play a major role in the sample, while expected scoring leads to higher ratings and generates more betting volume.

Betting Market Volume as a Preview of Television Ratings

Given that betting market volume and television ratings are shown to be influenced by many of the same determinants, it is possible that betting volume in some form may be helpful in explaining television ratings. Since betting market volume is known before the game is actually played and develops in a market during the course of the week leading up to the nationally televised game, this information may help to provide a glimpse inside the preferences of television audiences in advance of the game.

Most television contracts offer some assurances of ratings for advertisers. If the contracted ratings are not met, the advertiser will receive some form of compensation from the network. The network may give them additional advertising at no cost through “make-backs.” Given that Nielsen ratings are important to the bottom line of the network in this contract cycle (and in those to come in the future), any insight that may help to project if the game is going to meet the contracted ratings number or not can be valuable to the network. For instance, if the game is not expected to meet its viewership target, additional advertising can be put in place on the network and its family of associated networks or money may actually be spent to advertise the game on other networks to attempt to stimulate demand to watch the game. On the other hand, if the game is expected to exceed the contracted ratings, normal commercial time dedicated to advertise the upcoming game can be switched into actual commercials for products, which will increase the revenues of the network overall.

Knowing that both the betting market and television ratings respond to game quality factors (in addition to other known factors), simple aggregated betting volume may not provide additional insight into television ratings beyond wagering market-formed prices. However, the residuals of the betting volume regression shown in the previous section may be helpful in explaining future television ratings for the game. When the residuals are greater than zero, it implies that more betting is occurring on the game than would be anticipated due to game quality expectations, the month of the season, the network airing the game, etc. If the preferences of the bettors translate into preferences of fans, television ratings may be influenced by the same factors.

The residuals of the betting market volume regression may capture factors that are difficult to model outside of the point spread and total, such as effects of star players, fantasy sports implications, or very popular teams with the public (which will likely overlap with star players and being a good team to begin with), and may play a key role in explaining higher or lower television ratings than predicted based upon game characteristics.

Table 3: Impact of Residuals from Betting Volume Regression on Television Ratings – NFL Sunday Night Football and Monday Night Football 2009–2013

Dependent Variable:	Overall Nielsen Rating	18–49 Nielsen Rating	18–49 Nielsen Share of Rating
Intercept	4.63 (1.44)	2.23** (2.13)	7.08*** (2.75)
Sum of Win Percentages _{t-1}	2.11*** (3.49)	0.74*** (3.08)	1.67*** (2.93)
Absolute Value of Point Spread	-0.07 (-0.77)	-0.01 (-0.58)	0.01 (0.02)
Betting Market Total	0.18*** (2.87)	0.07*** (3.31)	0.19*** (3.49)
Sunday Night Football	6.16*** (12.75)	2.18*** (8.48)	4.32*** (6.64)
October	-0.98 (-1.32)	-0.62 (-1.87)	-2.54*** (-3.27)
November	-0.66 (-1.20)	-0.63** (-2.22)	-2.67*** (-3.83)
December	0.12 (0.13)	-0.59 (-1.77)	-2.26*** (-2.92)
January	1.44 (0.42)	-0.22 (-0.21)	-1.97 (-0.77)
2010	1.04 (1.11)	0.26 (0.93)	0.85 (1.16)
2011	0.18 (0.17)	0.06 (0.18)	-0.59 (-0.67)
2012	-0.15 (-0.15)	-0.07 (-0.22)	-0.23 (-0.28)
2013	-1.09 (-0.88)	-0.70** (-2.42)	-2.00** (-2.51)
World Series Dummy Variable	-2.71 (-1.93)	-1.29*** (-4.32)	-3.56*** (-5.26)
Residuals of Betting Volume Regression	0.00004** (2.26)	0.000009 (1.45)	0.00003 (1.75)
R-squared	0.63	0.64	0.60

*-notation notes statistical significance of the t-test that the coefficient is different from zero. ** represents statistical significance at the 5% level and *** represents statistical significance at the 1% level.

Therefore, using the same regression model for overall Nielsen ratings, ratings of the 18–49 year-old demographic, and the ratings share of the 18–49 year-old marketplace, we now add the residuals of the betting volume regression as an additional independent variable in the model. If games that are more (less) popular with bettors are also more (less) popular with television viewers of the NFL, this variable will have a positive and statistically significant effect on ratings. The results are shown in Table 3.

When taking the residuals of the betting volume regression and using them as an independent variable to explain television ratings, the residuals were shown to have a positive and significant effect on overall television ratings for prime time football. When betting volume was higher than expected due to game attributes, month and year effects, etc., television ratings were also shown to be positively impacted.

Unexplained factors not included in the betting volume regression model, such as potential impact of star players, popular teams (beyond team success and uncertainty of outcome), and others are shown to positively impact overall Nielsen ratings for Sunday Night Football and Monday Night Football games. It was not shown to be statistically significant, at the 5% level or below, for the 18–49 year-old demographic. The interest of the younger demographic does not appear to be influenced as heavily by the unexplained activity in the betting market.

Given that betting market volume is known before the game is actually played, this variable could be useful in forecasting television ratings. Games that are receiving more betting volume than expected are likely to have greater television rating success. Games that are lagging in betting volume, compared to expectations, are likely to have lower television ratings. Further research into the progression of betting volume during the week, its volatility, and whether it is forecastable during the window that would be useful to networks and advertisers may be fruitful avenues to pursue.

If possible, monitoring betting market volume could be helpful to the television networks broadcasting NFL games. If betting market volume is lower than anticipated, given the point spread and total on the game, it may be worth further advertising on its network (or the family of networks owned by Disney/ABC/ESPN or NBC) to attempt to boost ratings to meet ratings expectations of advertisers. If betting volume is beyond what is expected, those advertising spots could be transferred to actual product advertisements, eliminating the need to forego ad revenue at the expense of promoting the upcoming NFL game on these networks.

Conclusions

This research illustrated that television viewers and bettors of the National Football League enjoy many of the same characteristics. Using data from primetime NFL broadcasts of Sunday Night Football (NBC) and Monday Night Football (ESPN), television viewers and bettors were shown to enjoy the same on-field game features. Betting volume and television ratings, both overall and within the coveted 18–49 year-old bracket, were shown to positively be influenced by the quality of the two teams playing in the game (sum of win percentages) and the expected amount of scoring (betting market total). Controlling for these characteristics, expectations of uncertainty of outcome (point spread on game) was not shown to have a significant impact on either market.

Given that fans and bettors alike are shown to enjoy anticipated high-scoring matchups between two high-quality teams, the ex-ante prices formed and the subsequent volume seen in the betting market can be useful in projecting television ratings. Betting volume is known before the game is played and may be useful in forecasting ratings. Using the residuals of the betting volume regression as an independent variable in the television ratings regression models, it was shown that the residuals of the volume regression have a positive and significant effect on overall television ratings. Higher-than-expected or lower-than-expected betting volume is shown to transfer its effects to Nielsen ratings as the betting market serves as an indicator of future television viewership.

Following the likely progression of betting volume during the week leading up to the nationally televised game may provide insight about Nielsen ratings to television network executives. Given that television contracts usually have ratings targets, which may be costly to the network if the contracted ratings are not reached, betting market volume may help in choosing the frequency and viability of advertisements for the upcoming NFL game on the network and its associated family of networks. If betting volume is not reaching expected levels, given the quality of the teams and the expected amount of scoring, more advertising time may be useful in spurring viewership to meet contractual levels. On the other hand, if betting volume is exceeding expectations, advertising spots that would typically advertise the game can be substituted with actual revenue-generating product advertisements. In other words, market-based prices (point spreads and totals) and consumer response (wagering volume) from betting markets may serve a useful purpose to television networks when forecasting Nielsen ratings.

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