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Consumption Benefits and Gambling: Evidence from the NCAA Basketball Betting Market

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Abstract - The determinants of the total number of bets placed on games from three on-line sports books are analyzed for the 2008-9 NCAA basketball season. Betting volume depends on television coverage, temporal factors, the quality of the teams, and the expected closeness of the contest. Our results support the notion that consumption benefits motivate gambling rather than financial gain. Preferences of bettors appear similar to those of sports fans, suggesting that modeling gamblers as wealth-maximizing investors may not be appropriate, and supports the predictions of the model of gambling developed by Conlisk (1993).

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Introduction

Consumption benefits theoretically represent an important component of gambling activity. Conlisk (1993) developed a model of consumers' participation in gambling based on the presence of consumption benefits. This model predicts that small consumption benefits motivate consumers to participate in gambling even in the face of negative expected financial returns from gambling. Conlisk's (1993) consumption motive differs significantly from the financial motives for gambling underlying expected utility models for gambling like Friedman and Savage (1948), and many other expected utility

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based models that followed. The consumption-based model of Conlisk (1993) is also distinct from prospect theory, developed by Kahnenman and Tversky (1979), and other models that focus on the financial motivation for gambling and other decisions made under uncertainty. To date, no market-based empirical research based on data from betting markets has tested the predictions of Conlisk's (1993) model, while a considerable amount of empirical research exists on the financial motivation for gambling. Sauer (1998) reviewed much of the literature on gambling from the financial motivation for gambling.

The idea that gambling generates consumption benefits predates Conlisk's (1993) model. Samuelson (1952) commented that basing the value of a gamble solely on the monetary prize is likely incorrect, remarking "When I go to a casino, I go not alone for the dollar prizes, but also for the pleasures of gaming-for the soft lights and the sweet music." In the case of sports wagering, bettors might find certain propositions and games more desirable than others, either because of an expected financial gain from the game, or because betting on a certain game generated consumption benefits. If all, most, or even some bettors make wagers on sports events for the purpose of consumption, taking a financial stake in the game to make watching the game and following certain teams more exciting, betting volume should vary with factors fans find enjoyable.

In this paper, we analyze the volume of bets placed on NCAA men's basketball games to determine the role consumption benefits play in the decision to participate in gambling markets. Unlike previous research focused on the efficiency of betting markets and the related search for inefficiencies in prices set in these markets, we examine the intensity of consumer participation in sports betting to investigate the role that consumption benefits play. Without an understanding of the determinants of variation in betting volume, little progress can be made to distinguish the consumption motive for gambling from the financial gain motive. Analysis of variation in betting volume data holds the possibility of determining if consumption-related factors associated with fan behavior explain observed variation in betting volume, indicating that consumption benefits play an important role in consumers' decisions to gamble.

We estimate several reduced form models of the determination of betting volume based on data aggregated across three major on-line sports books. These models contain explanatory variables that reflect both consumption and financial gain as motive for betting, such as television coverage, uncertainty of outcome (captured by the point spread), scoring (captured by the posted total), and the quality of teams, including a proxy based on teams ranked in the top 25, for a sample of over three

thousand men's college basketball games played in the 2008-2009 season. If the consumption-related explanatory variables are not significant determinants of variation in betting volume, then the role of consumption in sports gambling may be unimportant or inconsequential. However, if these factors are significant determinants of betting volume, these independent variables can further our understanding of the behavior of bettors, potentially help sports books increase profits and improve the experience of their clientele, and help sports leagues develop more attractive matchups and schedules.

Data from the source here, off-shore on-line bookmakers, have recently been used to investigate alternatives to the frequently used balanced book assumption of book maker behavior used in much of the previous research on sports betting. The balanced book assumption claims that book makers set point spreads to balance bets on either side of a game and earn a certain profit from the commission charged to losing bettors. This assumption was used by Pankoff (1968), Zuber, et. al. (1985),Sauer, et. al. (1988) and many others. A growing body of evidence based on new data available from these on-line book makers challenges the validity of the balanced book assumption. For example, betting percentages were shown to increase with each point of the point spread in "sides" (wagering on game outcomes against a point spread) markets and with each point of the total in "over/under" markets in both the NFL (Paul and Weinbach, 2008a) and in the NBA (Paul and Weinbach, 2008b). These studies provide evidence of systematic imbalances and shed some light on the preferences of bettors for big favorites and road favorites (the best teams) and for the over (scoring). We contribute to this growing literature by analyzing college basketball betting volumes.

Empirical Analysis of Betting Volume on NCAA Basketball

To explore the importance of consumption benefits in determining betting volume, we estimate empirical models of the general form

$$V_{ijt} = f(HTEAM_{it}, VTEAM_{it}, GAME_{ijt}, CON_{ijt}, FIN_{ijt}, e_{ijt}) \quad (1)$$

where V_{ijt} is the number of bets placed on the game played on date *t* between home team *i* and visiting team *j*. $HTEAM_{it}$ is a vector of variables capturing characteristics of the home team in the game, , $VTEAM_{it}$ is a vector of variables capturing characteristics of the visiting team in the game, $GAME_{ijt}$ is a vector of variables capturing characteristics of the game, CON_{ijt} is a vector of variables that capture the consumption motivation for gamblers to bet on the game, FIN_{ijt} is a vector of variables that reflect the perceived financial attractiveness of bets on a game played between team *i* and *j*, and e_{ijt} is an unobservable error term that captures all other factors that affect the number of bets on games. We

assume that e_{ijt} is mean zero but the variance of may vary systematically, depending on the characteristics of the game and the participants in the game, so var(e_{ijt}) = σ_{ijt}, and we use the standard White-Huber "sandwich" correction for heteroskedasticity when estimating specific version of this model.

Note that we focus on factors related to financial and consumption based motives for gambling, and not on the actual financial gain from gambling. We do not investigate the profitability of bets on college basketball games. The observed betting volume reflects decisions made by informed and uninformed bettors. Uninformed bettors bet on those games which provide positive consumption benefits; informed bettors bet on games they perceive to be the most profitable. To some extent, distinguishing among team characteristics, game characteristics, factors related to consumption benefits, and factors related to expected financial benefits is somewhat arbitrary, in that team characteristics can generate both consumption and financial benefits. This general model simply points out that four types of factors can explain the number of bets placed on any game.

Patterns in betting volume, such as an increase in activity associated with the best teams or television coverage should not be evident if sports wagering is truly investment. If gambling is investment, we would not expect to see common attributes of fan behavior play a significant role in the betting volume of college basketball games. Instead, rational investors would seek out mispricing within the market and wagers would be made where profitable returns are expected. This search for mispricing includes gathering information about games scheduled, the teams involved in these games, and the point spread set by sports book makers on these games.

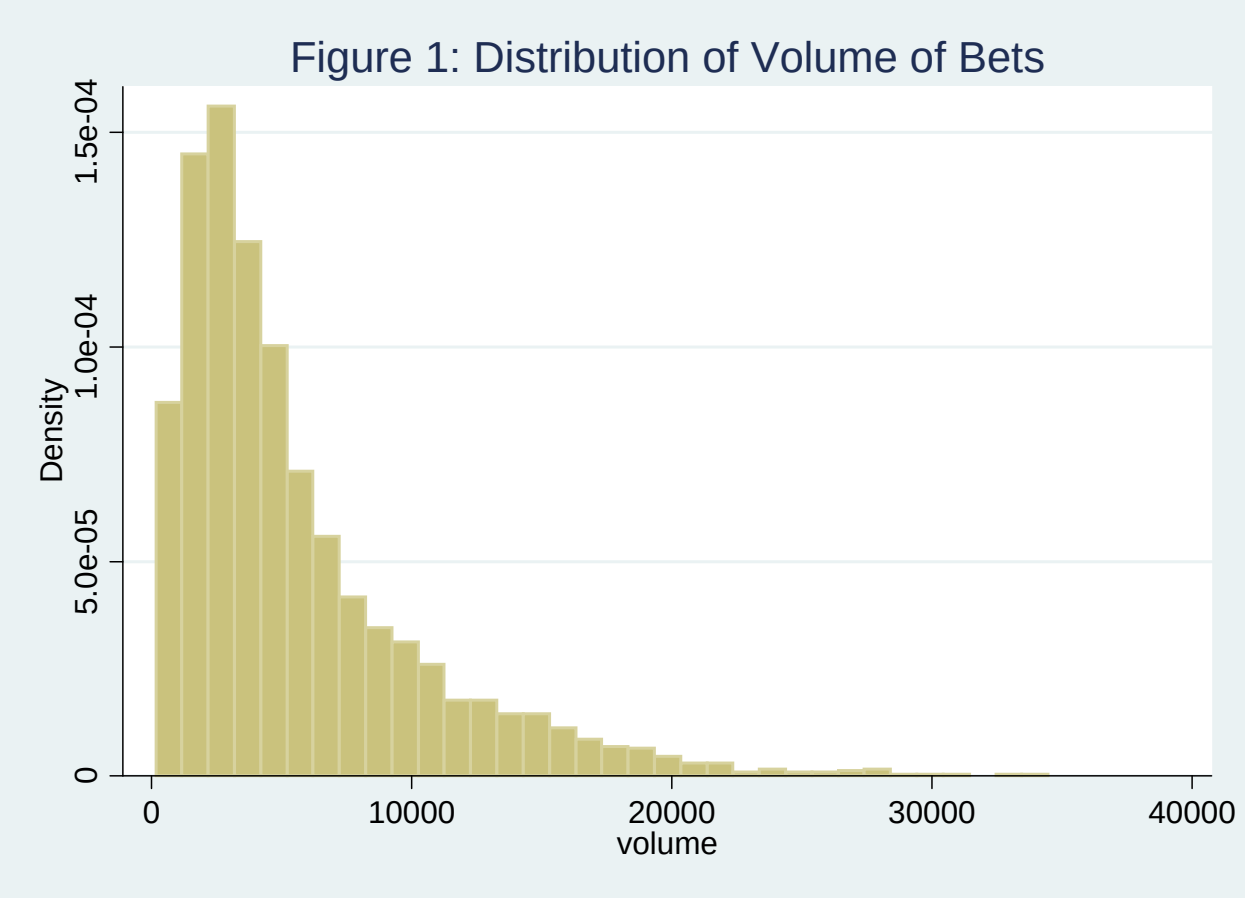
Data

The primary source of our data, including the bet volume, is www.sportsinsights.com, a sports betting information site that collects and distributes betting data from three off shore, on-line sports books. The three sports books included in the Sports Insights data are BetUS.com, FiveDimes.com, and Caribsports.com. These three on-line book makers have been in business for some time; BetUs.com was founded in 1994 and is the 6th largest on-line gaming site in the world; FiveDimes.com opened in 1998; Caribsports.com opened in 1997. All three on-line sports books offer betting on sporting events and horse races world-wide as well as on-line versions of traditional table games like blackjack. All of the variables obtained from sportsbook.com are average values across these three sports books. Although aggregated, these data are quite useful as betting volume data has been nearly impossible to acquire,

especially from large legal sports books. For example, Strumpf (2003) had access to bet volume data obtained from several illegal sports book makers operating in the New York area in the 1990s. Although interesting, Strumpf' (2003) data may suffer from regional biases and may not reflect betting patterns in a large, legal market, such as included in the Sports Insights data. We also collected data on point spreads, over/under, the volume of bets on either team in the games, and the outcome of games from this web site. The betting data were augmented with information about the rankings of teams in the games, and television broadcasts of the games.

The television coverage data were collected from a web site, www.collegehoopsnet.com, which collects detailed television broadcast information for NCAA Division I men's basketball games. We collected information about the network where each college basketball game was broadcast in the 2008-2009 season. These channels include the major networks, ABC, and CBS, and the major sports network family of ESPN (which includes, ESPN, ESPN2, ESPNU, and ESPN-Other, which includes limited broadcasts on ESPN Classic and internet-only ESPN360). In addition to these networks, other networks television games include Fox Sports Net, Altitude, CBS College Sports, CSS (Comcast), The Mountain, and Versus, and games available on regional college conference networks including the Big 10 Network, Big 12 Network, and Big East Network.

We have betting data on NCAA Division I men's college basketball games from the 2008-2009 season. We have volume data for 3014 regular season games involving 254 different home teams and 268 different visiting teams. The volume variable is the average number of bets placed on each game at the three on-line sports books. The average number of bets placed on a game in the sample is 5581, the median is 4068, and the standard deviation is 4791. The smallest number of bets placed on a game was 174 and the largest was 34481. The distribution of this variable is shown in Figure 1. Clearly, it contains a long right tail.



The temporal distribution of games may affect betting volumes, especially if consumption benefits are an important determinant of betting, because the opportunity cost of time for watching or following games differs across days of the week, and the excitement attached to games may change systematically as the end of the regular season approaches. Table 1 shows the temporal distribution of the games in the sample.

A majority of games are played on Saturday, and Wednesday is the next most common day for a game to take place in the sample. Monday and Friday are the least common days for a game to take place. The NCAA Division I men's basketball regular season runs from mid-November until early March. At the end of the regular season, most conferences hold postseason knockout tournaments, and in mid-March the NCAA Division I men's basketball tournament ("March Madness") and other post-season tournaments take place. Conference games typically dominate January, February, and early March. There are relatively few games in November and December in part because teams play fewer games in these months and in part because many early season games, especially games between teams with widely different abilities, are not of sufficient interest for sports books to take bets on.

Table 1: Temporal Distribution of Games

Time Period	Games	% of Games
Sunday	324	10.11
Monday	216	6.74
Tuesday	300	9.36
Wednesday	515	16.06
Thursday	423	13.19
Friday	201	6.27
Saturday	1,227	38.27
November	472	14.72
December	593	18.50
January	994	31.00
February	908	28.32
March	239	7.45

We also have detailed data about televised games in the sample. We collected information about where the games were shown, and the time of day when the games were shown. 735 of the games in the sample, 24.4% of them, were broadcast on television. Table 2 shows the distribution of games televised on the major channels in the sample. College basketball games appear on a number of broadcast outlets in the US, including free over the air broadcast networks (CBA and ABC), and a large variety of channels available only by subscription on cable television and satellite. CBS broadcasts the popular "March Madness" postseason tournament, and also a number of regular season contests on Saturday and Sunday; ABC broadcasts a handful of regular season games. These over the air network channels can be seen by every person in the US with a television on one of the network's local affiliates. ESPN, and its affiliates ESPN2, ESPN-U also carry a large number of college basketball games throughout the week. These channels are available on basic or extended cable in most cities in the US as well as by satellite.

Table 2: Game Broadcasters

Channel	Type	Games	Percent
ABC	Network	13	1.68
CBS	Network	38	4.90
RAYCOM	Syndicate	62	7.99
ESPN	ESPN Family	123	15.85
ESPN2	ESPN Family	105	13.53
ESPN U	ESPN Family	130	16.75
FOX SPORTS NET	Fox Family	78	10.05
FSN FLORIDA	Fox Family	2	0.26
FSN NORTHWEST	Fox Family	1	0.13
FSN PRIME TICK	Fox Family	7	0.90
FSN SOUTH	Fox Family	6	0.77
FSN SOUTHWEST	Fox Family	1	0.13
FSN WEST	Fox Family	1	0.13
HDN	Cable Sports Net	2	0.26
HDNET	Cable Sports Net	2	0.26
CBS COLLEGE SPORTS NET	Cable Sports Net	46	5.93
VERSUS	Cable Sports Net	7	0.90
ALTITUDE	Cable Sports Net	4	0.52
BIG 12 NETWORK	Conference Sportsnet	7	0.90
BIG EAST NETWORK	Conference Sportsnet	8	1.03
BIG EAST NETWORK LOCAL	Conference Sportsnet	3	0.39
BIG TEN NETWORK	Conference Sportsnet	62	7.99
THE MOUNTAIN	Conference Sportsnet	61	7.86

Raycom is a regional syndicator that shows games from the Atlantic Coast Conference on local over the air channels in the southeastern US. Fox operates a network of regional sports networks that are available on cable and satellite television in many homes, sometimes as a premium service. Finally, several major conferences have started their own sports networks that broadcast a large number of conference sporting events, including men's basketball games. These conference spots Nets have their own channels on cable and satellite, and many are available as part of basic cable packages. They are not widely available at this time.

We also collected betting data for NCAA Division I men's basketball games from sportsinsights.com and data on other characteristics of the games from a variety of sources. Table 3 shows the summary statistics for these variables related to betting on these games and other game characteristics. The point spread, expressed as the number of points by which the home team must beat the visiting team for a bet on the home team to pay off, was slightly larger than the difference in points scored by teams

in the games. As is common in point spread betting data, the difference in points variable is much more variable than the point spread variable. The forecast error, defined as the difference between the point spread and the points scored, is small, and the null that this variable is equal to zero is accepted at a P-value of 2.9%. The point spread is a good predictor of game outcomes. Note that the home team is favored in a majority of games in the sample. This reflects the well-established home court advantage in sporting events, and is consistent with the positive point spread on the first row.

Table 3: Summary Statistics, Other Variables

Variable	Mean	Std.Dev.
Point Spread	5.232	8.551
Difference in Points Scored	4.880	13.529
PS-DP	0.355	10.609
Over/Under	135.6	10.64
Total Top 25 Votes Received	85.70	211.80
Number of Games Played that Day	49	31
Home Team Favored	0.740	0.439
Win %, Bet on Home Team	0.483	0.500
Win %, Bet on Favored Team	0.486	0.500

The final two rows on Table 3 show the win % for bets on the home team and the favored team in each game. The Over/Under is the final value posted for bets on the total number of points that will be scored in the game, and represents a forecast of the scoring expected to take place in the game. The total number of points received by the two teams in the USA Today Top 25 poll that week is a measure of the perceived quality of the teams. The more points received by the teams playing, the higher the quality of the game. The number of games played on that day is a measure of betting opportunities available on each day to bettors. Always betting on the home team and always betting on the favored team are two well-known betting strategies. According to these means, following these two strategies over the 2008-2009 regular season would have resulted in a bettor losing more bets than were won. This is consistent with the point spread shading reported in Levitt (2004).

A Basic Empirical Model

Our basic model explains variation in betting volume using only team characteristics and game characteristics. The model is

$$V_{ijt} = \alpha_i HTEAM_i + \beta_j VTEAM_j + \delta_d DAY_{ijt} + \mu_m MONTH_{ijt} + e_{ijt} \quad (2)$$

The basic model includes separate indictor variables for each of the home teams and visiting teams, as well as indicators for the day of the week and the month when the game takes place. The team attributes indicator variables control for team quality and reputation, as well as the fan following of each team. Instead of a single team indicator variable, we include indicator variables for the home and visiting teams, which allows for different effects of reputation and team quality on betting volume for home and away games. The team indicator variables potentially reflect both consumption effects and financial incentives to bet on a specific game. Recall that bettors motivated by financial gain will evaluate games based on the teams participating, the location of the game, and point spread, and other factors when deciding if they should bet on a game. The relative strength of the teams playing will be captured by the home and visitor indicator variables, as will the size of the following of each team and the excitement generated by the game. The time indicator variables are also difficult to classify, in terms of the relative impact of consumption effects and financial gain effects reflected by these variables. The day of week effects are the most likely to reflect consumption benefits from betting on games. If the consumption benefits are derived from following games that have been bet on, then the opportunity cost of monitoring the game will vary with day of the week and time of day. The month indicators may reflect both consumption benefits and financial motives for gambling. If the consumption benefits are proportional to excitement generated by games, this will increase as the post-season approaches. However, the more games that a team plays, the more information about the quality of that team, and the quality of opponents is revealed. Additional information about the quality of teams may help bettors motivated by financial gains to identify bets with a greater likelihood of winning, leading to more financially motivated betting late in the season.

Table 4: Basic Model Estimation Results

Variable	Parameter Estimate	T-Statistic	
Monday	799	2.63	**
Tuesday	370	1.29	
Wednesday	-2505	-9.74	**
Thursday	-621	-2.28	*
Friday	-297	-1.00	
Saturday	-1896	-8.31	**
November	-2566	-13.50	**
December	-1414	-8.62	**
February	926	6.37	**
March	1190	5.10	**
N/R2	3017	0.71	

*: Significant at 5%; **: Significant at 1%.

Table 4 shows the results of estimating Equation (2) using OLs with the White-Huber "sandwich" correction for heteroskedasticity. This model also contains indicator variables for 253 individual home teams and 267 individual visiting teams to capture the effect of any unobservable team-specific factors on betting volume, but these results are not reported. In general, many of the individual home and away team parameters are statistically significant.

The omitted category on Table 4 is Sunday games in January. Betting volume is highest on Monday and lowest on Saturday. The betting volume increases from November to march, with the largest volume of bets made in March. Again, this may reflect the effect of more information about teams leading to more financially motivated betting or more excitement leading to more consumption related betting late in the regular season. The basic model explains 71% of the observed variation in volume of betting. Obviously team-specific factors and temporal factors are important determinants of bet volume.

The Effect of Television on Bet Volume

Televised games can increase bet volume for two reasons. If betting contains a consumption component, then watching a game and betting on a game may be complements, leading bettors to place more bets on games they can watch on television. However, televised games may provide bettors with more information about the quality of teams than other sources of information. Thus the more appearances a team has made on television, the more information financially motivated bettors have about that team. Repeated viewing of a team by a financially motivated bettor could increase the probability that a bet will be placed on a game involving that team, because the bettor perceives that

she has an advantage over the book maker in that game. This would increase the number of bets placed on that team. Based on this reasoning, increased betting on a game currently on television should reflect only consumption benefits from betting on the game, while the more time a team has appeared on television in the past, the more important the financial motivation for betting on a game, other things equal. We test this hypothesis by expanding the basic model to include variables reflecting current and past television appearances by the teams participating in each game.

Table 5: Regression Results, TV Model

Variable	Param.	T-Stat	Param.	T-Stat
Past Visitor TV Appearances	178	3.47 **	180	3.52 **
Past Home TV Appearances	86	1.83	79	1.67
Game Televised	1573	8.02 **		
Game Televised on:				
Network			2882	4.25 **
ESPN Family			2017	7.99 **
Raycom			1346	2.10 *
Confrence Sportsnet			952	2.35 *
Fox Sportsnet			1971	3.56 **
Regional Sportsnet			-59	-0.14
N/R2	3014	0.73	3014	0.74

*: Significant at 5%; **: Significant at 1%.

Table 5 shows the results for the expanded television model of betting volume. Again, the model contains indicator variables for all home and visiting teams, indicator variable for the day of the week, and for the month that the game took place in. The first television model includes an indicator variable that is equal to one if the game was televised and equal to zero if it was not televised. This variable should capture any consumption motivation for betting on this game. The bet must be made prior to the start of the game, so no information revealed during the broadcast of the game can influence a bettors' decision to bet on the game based on potential financial gain. This model also includes a variable for the number of times the visiting team and the home team appeared on television, not including the current game. These variables should capture any motivation to bet on the game based on financial gains. It cannot reflect consumption effects associated with the current game, because the current game is no included in the total, and this variable is greater than zero for many untelevised games. However, the more often each team has been on television, the more information bettors have about this team, and the more likely are bettors to find a bet on that game potentially profitable. The standard errors underlying the reported t-statistics are robust to heteroskedasticity.

The results of Table 5 support both the consumption motive for betting and the financial gain motive. Past television appearances by the visiting team, but not the home team, is associated with more bets on a game, other things equal. The fact that only visiting team television appearances are associated with increased betting is consistent with observed betting behavior. From Table 3, the home team is favored in almost 3 of every four games in the sample. Because of this home court advantage, bettors might need more information about the visiting team than the home team in any game in order to come to the conclusion that a betting on that game was a good idea. Alternatively, the signs on the home and visiting team appearance variables may simply reflect systematic decisions made by broadcasters; for example, broadcasters may be more likely to televise road games played by high quality teams. In any event, bet volume is higher on games broadcast on television, holding previous TV appearances by the participants constant. This result suggests that consumption benefits play an important role in gambling on NCAA basketball games. The final two columns of Table 5 replace the single television indicator variable with a separate indicator variable for games broadcast on each of the channel types identified on Table 2. Recall that the networks have the largest audience, followed by ESPN, and Fox Sports Net. The sign of the parameters on these separate channel indicators supports the consumption motive for betting, as they are all generally positive. The magnitude of the estimated parameters also supports the consumption motive for betting. Recall that networks have the largest potential television audience, followed by ESPN and then Fox Sports Net and the other regional and conference sports networks. Games televised on networks have the largest effect on bet volume, followed by games broadcast on ESPN and Fox Sports, consistent with the audience for each channel. In the next section, we show that these results hold when controlling for the point spread on the game.

Additional Betting and Consumption Related Factors

In order to further determine the extent to which the consumption and financial motives contribute to betting volume, we augment the television model with several additional explanatory variables that capture game and team characteristics. Three of these variables, the absolute value of the point spread on each game, the over/under number of the game, and an indicator for home underdogs, come from betting markets. The over/under on a game reflects the betting market's assessment of how much offense will take place, and may reflect how exiting bettors find the matchup. Betting on home underdogs frequently appears as a potentially profitable betting strategy in point spread betting, and a greater betting volume on games where the visiting team is favored would support the financial motive for gambling.

We interpret the absolute value of the point spread as indicating how close the betting market expects the outcome of the game to be. In games with a small point spread, the teams are of equal strength, indicating more uncertainty of outcome about the game. Economists have long considered the possibility that uncertainty about the outcome of sporting events affects fans' interest. Benz, et al (2009) is one recent investigation of uncertainty of outcome and fan interest. The absolute value of the point spread on a game is one indicator of uncertainty of outcome, as games with smaller point spreads feature closely matched teams. However, the point spread may also play a role in the financial motive for gambling, in that the point spread can be interpreted as the price on a contingent claim if a winning bet is made. We posit that, conditional on the relative strengths of the two teams, no systematic financially motivated relationship between the point spread and bet volume should exist. When deciding which games to bet on, financially motivated bettors assess the relative strengths of the two teams and compare the difference in perceived strength to the point spread on the game and bet on the game that perceive to be most favorable given their personal assessment of the relative strengths of the two teams. Games with an attractive point spread relative to the strengths of the teams will be wagered on by gamblers with a financial motivation for gambling. These attractive games could be at any point spread, conditional on the relative strengths of the team. There does not appear to be any reason to believe that a systematic relationship between the absolute value of the point spread on a game and the attractiveness of the game as an investment opportunity exists; games that financially motivated bettors find attractive could be found at large or small point spreads. We control for team-specific attributes in the empirical model, thus any systematic relationship between bet volume and the point spread should be attributable to uncertainty of outcome, a consumption related motivation for gambling.

Table 6: Regression Results, Additional Variables

Variable	Parameter	t-Statistic	
Point Spread	-92.02	-5.38	*
Over/Under	4.12	0.26	
Total Top 25 Votes Received	2.62	2.98	*
Home Underdog	-24.88	-0.13	
Number of Games Played that Day	-42.45	-10.99	*
N/R2	3014	0.751	

*: Significant at 1%.

Table 6 contains the parameter estimates and t-statistics for the additional variables added to the television model. Again, this model contains all of the explanatory variables that were in the television model above; we do not report the results for these other parameter estimates, but they are available on request. In general, the addition of the variables on Table 6 did not have much impact on the parameter estimates reported above for the basic model and television model. The parameter estimates on Table 6 support the consumption motive for gambling. The estimated sign on the point spread variable is negative and statistically significant, indicating that uncertainty of outcome has an important effect on betting volume. The smaller the point spread, the more bets made on a game, other things equal. The larger the number of votes received in that week's USA Today Top 25 poll by the two teams playing, the more bets made on that game, other things equal. This suggests that bettors like to wager on games played between high quality teams, also supporting the consumption motive for gambling. The more games played on any given day, the smaller the number of bets on a game, holding other factors including the day of the week constant. The number of games played reflects the number of substitute games available for betting on any day. The existence of more substitutes will spread out the wagers made by both consumption motivated bettors, since there are more alternatives, and by financially motivated bettors, who are more likely to find a financially more attractive alternative game to bet on. The negative and statistically significant estimated parameter on this variable supports both motives for gambling. Home underdogs do not attract more bets, which does not support the financial gain motive for betting.

One potential problem with this model is that the point spread variable, which is set by book makers, may be correlated with the unobservable equation error term, e_{ijt} in the regression model. In this case, Ordinary Least Squares parameter estimates would be biased and inconsistent. As an alternative, we estimated this model using instrumental variables to correct for this problem. In the first stage regression in the IV estimator, the point spread was the dependent variable, and indicators for conference games in the six major conferences (the Big 10, PAC 10, Big 12, Southeast, Atlantic Coast and Big East conferences) and ranked teams were used as instruments. The F-statistic on this first stage regression was 22, indicating that we do not have weak instruments. The estimated parameter on the point spread variable, and all the other explanatory variables, were not qualitatively affected by the use of IV to correct for potential correlation between the point spread and the equation error. The estimated parameter on the point spread variable was larger, and less significant in the IV model.

Conclusions

Our analysis of the determinants of the volume of bets placed on college basketball games supports both the consumption motive for gambling and the financial motive for gambling. Bettors appear to be affected by many of the same factors which influence fan behavior, indicating that some participants in sports betting markets are motivated by consumption benefits. We find bet volume increases for games between high quality opponents, games appearing on the major television networks, and games between closely matched opponents. Bettors prefer to wager on games with greater uncertainty of outcome, consistent with the behavior of fans, who prefer to attend games with greater uncertainty of outcome. These results are exactly what would be expected from fans of college basketball, and bettors appear to have similar preferences.

Betting on college basketball also appears to depend on factors related to the financial motive for betting, although many of the variables related to financial motives for betting, like games where the visiting team is favored, do not explain observed variation in bet volume in this sample. The significant factors related to the financial motive for gambling also have consumption-related interpretation. For example, the more games available to bet on, the fewer bets placed on any game; this can be explained by both consumption and financial motivations for betting.

Sports betting appears to complement watching games on television. The best matchups of the week not only attract the most fans to the arena, and the most viewers on television, but also the most bets at sports books. If wagering on sports was motivated by investment, undertaken for financial gain like investing in the stock or bond market, we would not expect variation in betting volume to be explained by so many factors related to consumption benefits. Bettors as investors would likely search for prices (point spreads and totals), where value was offered, resulting in a non-systematic relationship to fan-oriented variables.

From Table 3, bets on home teams and favored teams won less than 50 % of the time in this sample, suggesting that a betting strategy based on betting on these teams would have lost money if followed over the course of the season. Although other profitable strategies may exist, the unprofitability of these simple betting strategies raises questions about the financial motive for gambling on college basketball games. However, the model developed by Conlisk (1993) predicts that consumers will gamble even if the face of expected losses, if they derive utility from the act of gambling. Our results provide support for Conlisk's (1993) model of gambling. We show that betting volume depends on a

number of factors related to consumption benefits, like televised games, games between high quality teams, and games between closely matched opponents. Consumers likely derive utility from betting on games that they play to watch on television, which is constituent with the predictions of Conlisk's (1993) model. To our knowledge, this is the first empirical evidence supporting this model from betting markets.

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