EXAMINING NCAA/NFL MARKET EFFICIENCY

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ABSTRACT

Billions of dollars are wagered every football season in the hopes of identifying a winning strategy. Numerous articles have been conducted that try and identify inefficiencies in football betting markets. While many studies have determined that the betting market is efficient, there are a few articles that have identified potential anomalies in the football betting markets. The sustainability of these anomalies is still another question. This study takes an alternative approach in testing the market efficiency of betting on NCAA college football and National Football League (NFL) games. A unique, primary source data set was collected between 2003 and 2011, which offers some additional insight in the study of market efficiency that has not been included in previous studies. The results of this study indicate that the betting market is indeed efficient.

INTRODUCTION

Gambling on the outcome of an event dates back to the Chinese, Japanese, Greeks and Romans in 2300 B.C. In the United States, gambling dates back to the Native Americans and early Colonists (Roberts, 1997). From cockfights, horse races, and bare-knuckled fights, Americans throughout history have been drawn towards picking a winner (Martin, 2012). In the U.S., Gambling has evolved into a multi-billion dollar industry with significant economic impacts (Bazelon, Neels, & Pallavi, 2012). NCAA college football and the National Football League (NFL) are two of the most popular forms of gambling (IntenseGambling.com, 2012).

There are a variety of different forms of betting on football, the most popular of which is using a point spread. In this form of betting, the underdog team is "spotted" the point spread amount. In order for the favorite team to win the bet, their score must exceed the point spread differential. Thus the point spread that the bookmakers come up with has a huge impact and miscalculations may result in major gains or losses. Bettors are constantly trying to identify opportunities to win. However, if the football betting market is efficient then there would not be any sustainable opportunities.

The bookmakers also receive their "take" of the bet, called "the vig." A standard football bet would be to place a $110 wager in order to win $100. If the bettor is correct, then they would receive $100 along with $110 that they initially bet. Factoring the vig into the bet means that in

order for bettors to realize a profit, they need to be correct more than 52.38% (110/210) of the time.

Numerous studies have been conducted testing the efficiency of the NFL betting market. A number of studies find the NFL betting market to be efficient (Boulier, Steckler, & Amundson 2006; Dare & Holland, 2004; Boulier & Steckler, 2003). There have been other studies that have identified possible betting strategies that may lead to potential profits. For example Borghesi, 2007a revealed that home teams and the weather could be taken advantage of. Borghesi, 2007b identified late season biases and Paul & Weinbach, 2002 noticed an over-under betting strategy that would yield small profits, although they did not believe this anomaly would last over a long period of time.

The college football market differs from the heavily watched professional market. College coaches do not have to reveal injury reports, and players on professional teams are very well known, whereas many freshman/sophomore players on college teams are not. This lack of information may provide local bettors with additional information that the bookmakers and non-local bettors don't have easy access to.

Efficiency in the NCAA football betting market has not been tested as frequently as the NFL betting market, yet has similar results. A number of these studies have shown the efficiency of the NCAA Football betting market (Fair & Oster, 2005; Paul *et. al,* 2003; Dare & McDonald, 1996; Golec & Tamarkin, 1991). Sinkey & Logan, 2009 however, point out that many of the previous studies used limited data and used indirect tests of market efficiency. In their study, they find that the NCAA market is inefficient and profits can be made by looking at a combination of home teams, favored teams with strong traditions and on teams that play weak opponents. They find that the inefficiency is due to the bookmakers response to the gamblers behavioral bias.

DATA/METHODOLOGY

Given the mixed results from the previous studies, this research examines market efficiency in football betting markets. Specifically, the data in this study is from local bettors in a small geographical area. In order to test the efficiency of football betting markets, a unique approach for data collection was undertaken. For a given week during the football season (September – December) ten games were selected, five college games and five NFL games. The five college games were selected based on a few factors, national ranking, regional interest, and whether the game was televised. The five NFL games were selected similarly. Typical games would be those that included the Houston Texans, the Dallas Cowboys, Sunday and Monday night games, teams with good records and were nationally ranked and games that were locally televised.

Participants were asked to pick the favorite or the underdog for the given point spread. Point spreads were chosen on Wednesday mornings from an aggregate collection of published

point spreads. They were to rank the certainty of each game from 10 to 1 (using each number once). For a given point spread, a 10 was assigned to the team that the individual thought would most certainly cover or beat the spread, and a 1 to the individual's least certain pick. If their selection was correct they would receive those points. The winner for the week was the individual with the most points. Thus, if the individual was right on all 10 games they would get the maximum of 55 points (10 + 9 + … + 1). As an added incentive, individuals would pay $5.00 each week to play with the winner receiving the entire entry fee, i.e. winner takes all. The forms were due in before the first game on the sheet, which was typically Saturday mornings. A sample entry sheet is shown in Figure 1 below.

The data was collected from 2003 – 2011. Each year the number of weeks ranged from 12 to 15. The discrepancy in numbers is a result of whether or not Thanksgiving week was included, if a natural disaster occurred, or the inability to get the picks out. This resulted in 123 weeks of picks. On average, ~34 individuals would pick each week, with the most number of picks in one week being 52 and the least number of picks being 10. The total number of picks were 4,074.

RESULTS

In order to test the market efficiency of the football gambling market one would hypothesize that if the market is efficient, then the average score of the picks would be 27.5 (55 possible points/2).

H_0 *μ = 27.5. If the football betting market is efficient, the average score of the picks will not deviate from the overall mean of 27.5.*

The average from our data resulted in an average score of 28.7. Performing a t-test on the mean indicates the average score is significantly different from 27.5 with a p-value of 0.00. Thus, given this unique data sample, the results suggest that the NCAA and NFL betting markets may not be efficient. However, factoring the vig in, then the average score that the bettor must obtain is 28.81 (55 x .5238). Testing this hypothesis:

H_0 *μ = 28.81. If the vig is factored into whether the football betting market is efficient, the average score of the picks will not deviate from the mean of 28.81.*

The results of this test indicate no significant difference exists between the means at a p-value of 0.46.

Figure 1: Sample Data Sheet

Name: _____ **Phone:** _____

FOOTBALL PICKS Week 4 e-mail: _____

$5.00 Entry

Pick the winner of each game with the point spread.
Rank the certainty of each game from 10 to 1 (use each number once).
10 is most certain, 1 is least certain.
Put the # next to the team you think will win with the point spread.
The winner is the person with the most points.
Home Team is in ALL CAPS

	FAVORITES		**UNDERDOGS**	
	College Games	Points		
_____	Texas A&M (14) (11:00)	3	ARKANSAS (18)	_____
_____	SO CAROLINA (10) (2:30)	9 1/2	Auburn	_____
_____	VA TECH (11) (5:00)	7	Clemson (13)	_____
_____	Alabama (3) (7:00)	3 1/2	FLORIDA (12)	_____
_____	WISCONSIN (7) (7:00)	9	Nebraska (8)	_____
	NFL Games	Points		
_____	DALLAS (12:00)	1 1/2	Detroit	_____
_____	HOUSTON (12:00)	4	Pittsburgh	_____
_____	NY Giants (3:05)	1 1/2	ARIZONA	_____
_____	BALTIMORE (7:25)	3 1/2	NY Jets	_____
_____	TAMPA BAY (7:35)	10	Indianapolis	_____

One could also surmise that if the market were inefficient then the individual's most certain pick, their 10 pointer, would be correct more often than their least certain pick, their 1 pointer. Table 1 provides the number of correct/incorrect picks for each certainty level. There is

very little variation in the picks. However, in all cases the bettors were correct more than half (2,037) the time.

Table 1: Number of Correct/Incorrect Picks by Certainty Level (n = 4,074)		
Certainty Level	Correct	Incorrect
10	2,185	1,889
9	2,131	1,943
8	2,148	1,926
7	2,072	2,002
6	2,068	2,006
5	2,131	1,943
4	2,133	1,941
3	2,099	1,975
2	2,091	1,983
1	2,118	1,956

Table 2 contains the p-values from the tests of equality between the average number of correct certainty picks compared to each of the other correct certainty picks. The results do not indicate that the individuals' most certain pick is significantly better than their least certain pick. For example, the average number of times individuals were correct with their certainty score 1 selection is statistically equal to the number of times individuals were correct with their certainty score 10 selection (p-value of 0.48).

Table 2: Equality of Means Test Results (p-values)									
Certainty Score	Certainty Score								
	2	3	4	5	6	7	8	9	10
1	0.77	0.84	0.87	0.89	0.59	0.62	0.75	0.89	0.48
2		0.93	0.65	0.67	0.80	0.84	0.54	0.67	0.32
3			0.72	0.73	0.74	0.77	0.60	0.73	0.36
4				0.98	0.49	0.51	0.87	0.98	0.59
5					0.50	0.53	0.86	1.00	0.57
6						0.97	0.39	0.50	0.21
7							0.42	0.53	0.23
8								0.86	0.70
9									0.57

CONCLUSION

This study looked into the market efficiency of the football betting markets, investigating both the NCAA and NFL markets. A unique data set was collected from local bettors capturing their level of certainty in identifying potential wins in college and professional games. The

results indicate that bettors are correct more than 50% of the time. However, from a profitability stand point, after factoring in the bookmakers take, the vig, the bettors are not better than average. The latter results support the findings that the football betting markets are, in general, efficient.

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