Sport provides an excellent platform to examine whether human perception aligns with statistical outcomes. One such instance is the common belief that the results of uncertain future outcomes are tied to the results from previous outcomes. In general, the perception is that an individual is more likely to be successful in an upcoming event if they have been successful in the preceding events. In other words, there is widespread support for the existence of positive momentum effects. Researchers have labeled this phenomenon the “hot hand” hypothesis (Gilovich, Vallone & Tversky, 1985). While this phenomenon has been well examined in the academic literature, the debate surrounding its existence continues due to mixed empirical results from a variety of contexts. We extend the literature in this area by examining whether college football teams are more likely to 1) win a game and 2) cover a spread in a game based on previous outcomes associated with the team of interest and its opponents.

Research Questions

We estimate a series of models to test for the presence of momentum effects as it is uncertain in which contexts momentum or the loss of momentum may be associated with the outcome of a contest. We formally state the research questions below from the win/loss perspective. We ask equivalent questions in reference to whether the team covers the spread.

Q1: Is a team more likely to win their next game given the fact that they are on a winning streak?
Q2: Is a team more likely to win their next game given their relative performance in the previous games?
Q3: Is a team more likely to lose their next game given that they were on a winning streak, but lost their previous game?

Related Literature

Building off of literature in the areas of cognition, human judgment and probability theory, the work of Gilovich, Vallone and Tversky (1985) is the seminal paper on the hot hand in sport. The authors found that NBA players were more likely to hit a foul shot if they made their previous attempt. Arkes and Martinez (2011) were the first to find support for the hot hand in the team context, illustrating positive momentum effects for NBA teams. The literature also shows that there is widespread belief in the hot hand as the betting market responds favorably to teams with positive momentum (i.e. – Brown & Sauer, 1993; Paul & Weinbach, 2005; Paul, Weinbach & Humphreys, 2012). The present contribution is unique in two specific manners. First, while previous literature has illustrated that the betting market favors teams with positive momentum, we test for whether or not these teams are actually more likely to win and cover the spread. Second, we examine momentum effects in a unique team context as in football 1) a larger number of players decide the outcome (existing work is almost exclusively in basketball where a small number of players decide a contest); 2) there is a longer time period between contests (does momentum possibly dissipate?); 3) amateur athletes are competing (does momentum carry over for non-professionals?); and 4) there are a relatively small number of games in a season (does momentum matter in a short season?).

Method and Data

Logistic regression is used to separately estimate the probability that 1) a team wins a contest and 2) a team covers the spread in a contest, based on a set of covariates, which include the presence of momentum or the halting of momentum. The general form of the logistic regression follows:

$$\Pr(Y_{it} = 1 | \alpha, \gamma, \psi, \delta) = \frac{1}{1 + e^{-\beta_0 + \beta_1 \alpha + \beta_2 \gamma + \beta_3 \psi + \beta_4 \delta}}$$

where $$Y = 1$$ if the home team 1) wins and 2) covers the spread contest $$i$$ in season $$t$$, $$\alpha$$ is a vector of variables representing the presence of momentum or the halting of previous momentum for both the home and away team, $$\gamma$$
is a vector of variables representing the quality of the competing teams, $\psi$ is a vector of variables representing strength of schedule for the contests previously played by both teams, $\delta$ is a variable vector accounting for the amount of rest prior to the contest for each team and $\varepsilon$ is the error term. $\beta_0$ is a constant, $\beta_1$ through $\beta_4$ are the coefficient vectors to be estimated and $FL$ is the cumulative logistic distribution function, $FL(z) = 1 / (1 + e^{-z})$ where $z = \beta_0 + \beta_1 \delta + \beta_2 \gamma + \beta_3 \psi + \beta_4 \delta$.

We utilize game-level data from the 2009 through 2014 regular seasons in National Collegiate Athletic Association (NCAA) Football Bowl Subdivision (FBS) college football. In total, there are 3747 observations.

Results and Implications

Our preliminary results suggest that positive general momentum for either team in the games preceding the upcoming contest is associated with an increased probability of that team losing the upcoming game. For example, if the home (away) team has performed well in the games preceding the upcoming contest, the home (away) team is significantly more likely to lose the upcoming game. These results provide initial evidence against positive momentum effects in college football. Further, we find no support for the hypothesis that a team is more likely to win its upcoming contest given that it enters the game on a winning streak. In fact, the opposite is found as significant effects are uncovered in situations where a team is on a winning streaks of five games or more. If the home (away) team is on a winning streak, the away (home) team is significantly more likely to win the upcoming contest. These results again provide evidence against positive momentum effects. We also find no consistent support for the halting of momentum being associated with the outcome of a given contest.

In the models examining the probability of a team covering the spread in the upcoming contest, we find that the home team is more likely not to cover in the upcoming contest given that they have covered in a larger number of games preceding the current contest. Further, we discover no consistent support for a team being more likely to cover the spread in an upcoming contest given that they are on a winning streak in covering the spread. Finally, we find no evidence that the halting of momentum with regard to a team covering the spread is associated with a team covering the spread in the upcoming contest.

This study tests for the presence of momentum effects in a unique team sport context and adds to the growing literature in this area. Our results have direct implications for betting market odds makers as our empirical results do not match with public perception regarding positive momentum.