

A Test of Thoroughbred Horserace Betting Market Efficiency: Track Bias at Tampa Bay Downs and Saratoga Race Course

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In his comprehensive examination of the literature on racetrack betting, Sauer (1998, page 2048) notes as Number 1 of his summary of the key findings in the literature that "(w)in pool shares are good approximations to the probability that a horse wins the race, the favorite-longshot bias notwithstanding." Much attention has been devoted in the racetrack literature to detecting regularities at an aggregate level. See, for example, Griffith (1949), McGlothlin (1956), Hoerl and Fallin (1974), Ali (1977), Snyder (1978), Figlewski (1979), Losey and Talbott (1980), Hausch, Ziemba, and Rubinstein (1981), Asch, Malkiel, and Quandt (1984), Bolton and Chapman (1986), Busche and Hall (1988), Busche (1994), Swidler and Shaw (1995), and Coleman (2004). However, relatively few studies have focused on identifying simple examples of persistent mispricing. The favorite-longshot bias referred to by Sauer (1998) is an exception to this generalization. The Finance literature, in contrast, contains many studies that examine particular situations where market prices appear to deviate from what could be construed as intrinsic value. See for example Seyhun (1990), Huberman and Regev (2001), and Cooper, Dimitrov, and Rau (2001). Ironically, particular betting market anomalies may be even more useful than equity market anomalies for developing models of wagering (and perhaps investment) behavior. One advantage that betting market studies have relative to equity market studies is that the expected payoffs to the "investments" in betting markets have very short horizons and unambiguous interpretations.

We discuss the circumstances under which a persistent track bias is likely to exist, and assess whether the public processes available information to determine if horses in certain post positions win more frequently than they would if the race track were perfectly unbiased. Secondly, when statistical tools tell us that a racing surface is likely biased, we examine whether the odds determined by the betting market appropriately reflect that bias. The second issue allows us to make inferences about betting market efficiency since the data about wins from each post position are readily available to the public. The existence of a biased racing surface also presents race track management with a difficult problem. In addition to bettors, horse trainers expect the race track to be unbiased. It is costly to train and board a thoroughbred horse, and the trainer and owner of a horse expect they will have a fair opportunity to win a share of the purse offered. If the probability of winning the race is dramatically reduced merely because of being placed in an unfavorable post position, trainers of such disadvantaged horses will be understandably unhappy with track management and may prefer to enter their horses at tracks where the surface is unbiased. In addition, efforts taken by track management to mitigate an existing bias during a racing season may result merely in shifting the bias to a different part of the racing surface. This might only perpetuate the situation and may aggravate any perception that track management is unfair to trainers and/or bettors. Management might easily be accused of manipulating the racing surface to favor particular interests. This study examines two instances of biased racing surfaces at two North American racetracks, one of these a long-term bias, and the other perhaps a transient bias.

Data for both race courses in this study were hand-collected from full (i.e., including post position data, and not merely program numbers) daily race charts (ChartPlus™) purchased from Equibase Company, LLC®. The expected probability of a horse winning from each post position is calculated from the Equibase data. Based on Sauer (1998) and others, it is a reasonable assumption ex ante that each post position had an equal chance of winning each race, since post positions are assigned through a random draw. Another way to look at this is that the horse most likely ex ante to have won the race should not have been systematically assigned to any particular post position or range of post positions.

We use a Kolmogorov-Smirnoff non-parametric test to show that at Tampa Bay Downs a persistent track bias existed in five furlong turf races from the 2003-2004 through the 2007-2008 meet (five racing seasons). Horses in post positions one through five won a disproportionate number of the 123 races run at this distance over this period. Furthermore, simple wagering strategies yield positive returns over the entire period as well as in most individual seasons. By wagering on the horse which had the lowest odds among the first five post positions, bettor would have won 44 races (35.8 percent) and enjoyed a return on investment of over 26 percent. Furthermore, this pattern was present in four of the five individual racing seasons examined. An alternative betting strategy used was to bet to win only if the betting favorite in the race was among the first five post positions. There were 63 races that met this criterion over the five seasons examined. A bettor would have won 27 (42.9 percent) of these races and had a return on investment of over 19 percent. The betting rule would have been profitable in four of the five individual seasons. In addition, using the same methodology and data source, we find that a "dead rail" track bias existed at Saratoga Race Course in Saratoga Springs, New York for the 2007 racing season for races on the main turf course at five and one half furlongs. A dead rail bias favors outside post positions. It appears that the bias at Saratoga was peculiar to that

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particular meet. However, a bettor could have won 11 of the 38 races, or 28.9 percent by using a simple betting rule. The rule entails betting to win on the horse in post positions seven through twelve which had the lowest odds.

This strategy would have yielded a return on investment of 39.3 percent. We conclude that the odds at Tampa Bay Downs over the past five seasons, and in particular the three most recent seasons (when the bias was clearly evident) do not appropriately reflect the bias of the racing surface in five furlong turf races. We conclude that, despite readily available public information about post positions, the betting market for these races at Tampa Bay Downs is inefficient. The total bet on the 123 Tampa Bay races examined in this study was approximately \$37 million, while over \$57 million was bet on the 38 races at Saratoga Race Course. It seems unlikely that the mispricing of probabilities documented in the study is merely a consequence of the behavior of uninformed bettors.