AN *UNDER* BIAS IN THE FOOTBALL BETTING MARKET: FACT OR FICTION?: A NOTE

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ABSTRACT

Betting that total points in a football game will go over or under the Las Vegas number prompts the question whether that number has been inflated to adjust for the documented preference of bettors for the *over*. If bettors do overbet the over, regular profits should accrue to those betting under the total. Our investigation spanned the 1995-2004 National Football League seasons and found that betting under produced an unimpressive wins-to-bets ratio of 50.4 percent. The lone nonrandom ratio that was not year-specific was the 52.7-percent mark for National Football Conference games over the 2000-2004 years. Once again the market for wagers on football games proved to be remarkably efficient.

BACKGROUND

When Pankoff (1965) suggested that the efficiency of people's average economic judgments could be tested quickly and directly by examining the outcomes of imaginary bets on football games, sports-betting studies proliferated. Pankoff's analogy between investors and bettors rested on his observation that the latter were no less numerous, knowledgeable or profit-maximizing than the former. Early supporters [Vergin and Scriabin (1978), Tryfos et al. (1984), Zuber et al. (1985), Gandar et al. (1988), Russo et al. (1989), Golec and Tamarkin (1991) and Kochman and Badarinathi (1992)] focused on football while later researchers expanded into basketball [Brown and Sauer (1993) and Kochman and Goodwin (2000)], baseball [Woodland and Woodland (1994) and Kochman and Badarinathi (1997)] and hockey [Woodland and Woodland (2001) and Kochman and Goodwin (2003)]. Despite the variety of sports and statistical tests, all found little evidence of exploitable errors.

While *side* bets (betting that one side, or team, wins at the other's expense) may produce only breakeven results, *totals* betting (gambling that total points in a game will be greater or less than the Las Vegas number) has raised some doubt about the market's efficiency. Badarinathi and Kochman (1996) found no fewer than six betting rules—all based on betting under the total—that produced nonrandom wins-to-bets ratios during the 1984-1993 seasons of the National Football League. One rule (*Bet under when the visiting team is playing its second straight game on the road.*) was nonrandomly profitable at $p < 0.05$. Kochman and Badarinathi (1996) uncovered three nonrandomly profitable strategies when betting

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specific NFL teams under the total during the 1985-1994 seasons. More recently, Paul et al. (2004) reported that betting under NFL totals beat the 52.4-percent breakeven rate but failed to represent a statistically significant violation of the efficient markets concept.

METHODOLOGY

To understand why betting the *under* in football enjoys the empirical support, we would first have to assume that Las Vegas totals are systematically overstated—thereby creating regular profit opportunities for those betting under. Researchers [e.g., Paul and Weinbach (2005) and Paul and Weinbach (2002)] have reasoned that totals are overstated because oddsmakers anticipate the tendency of bettors to overbet the over and therefore adjust the total upward. In the absence of any explanation in the literature of why bettors behave this way, we could speculate that they have an inherent belief that totals are understated and/or they simply like to be entertained by the kinds of plays that make games go over (e.g., touchdowns, long runs and completed passes) vis-à-vis the miscues that impede scoring such as fumbles, interceptions and penalties.

While we suspect that bettors enjoy offensive displays, enough of them may have recognized an opportunity as contrarians to bet football games under and, in turn, drive out the under bias. To test that suspicion, we tracked the final scores of games in the National Football League (NFL) over the 1995-2004 seasons and compared them with their respective Las Vegas totals. By partitioning our 10-year measurement period into two five-year halves, we hoped to learn whether potential trends are historical or recent; by dividing the NFL into the National and American Football Conferences, we were looking for different scoring patterns that might be conference-specific. Equations (1) and (2) below are not unlike those in Gandar et al. (2001) and are used to identify pointwise records as nonrandom (W/B vs. 50 percent) and nonrandomly profitable (W/B vs. 52.4 percent[1]), respectively. The sources of our data were two newsstand magazines: *The Gold Sheet College and Pro Football Annual* (2005) and *Marc Lawrence's Playbook* (2002).

(1)
$$Z_R = \frac{(W/B - 0.5)}{\{[(0.5)(1 - 0.5)]/B\}^{1/2}}$$

(2)
$$Z = \frac{(W/B - 0.524)}{\{[(0.524)(1 - 0.524)]/B\}^{1/2}}$$

where: Z_R = statistic for testing the null hypothesis of randomness

Z = statistic for testing the breakeven null hypothesis

W = number of winning bets

B = number of total bets

RESULTS

Imagining that we had bet on all NFL games to go under their respective totals during the 1995-2004 seasons, we would have placed a grand total of 5001 wagers and won 2520 of them for a wins-to-bets ratio of 50.4 percent. It is also evident from Table 1 that the National Football Conference would have produced a higher success rate (51.4 percent) than that for the American Football Conference (49.3 percent). When we divided our 10-year measurement period into five-year halves, we found that the W/B ratio for under bets in NFC games improved from a breakeven rate of 50.0 percent (1995-1999) to a nonrandom mark of 52.7 percent (2000-2004). A slight improvement was also registered by the AFC: 48.9 percent (1995-1999) vs. 49.6 percent (2000-2004). The only W/B ratios that were statistically nonrandom in addition to the 52.7-percent rate for 2000-2004 were the 56.9-percent outcome for NFC contests in 2001 and the 54.4-percent mark for all NFL games in 1995[2].

Table 1
Wins-to-bets ratios when betting NFL games under the *total* betting line (1995-2004)

Year	NFC	AFC	All
2004	143/264 (54.2%)	125/266 (47.0%)	268/530 (50.6%)
2003	138/264 (52.3%)	138/262 (52.7%)	276/526 (52.5%)
2002	129/266 (48.5%)	132/261 (50.6%)	261/527 (49.5%)
2001	148/260* (56.9%)	116/250 (46.4%)	264/510 (51.8%)
2000	135/261 (51.7%)	119/230 (51.7%)	254/491 (51.7%)
2000-2004	693/1315* (52.7%)	630/1269 (49.6%)	1323/2584 (51.2%)
1999	128/263 (48.7%)	124/230 (53.9%)	252/493 (51.1%)
1998	130/262 (49.6%)	104/215 (48.4%)	234/477 (49.1%)
1997	139/268 (51.9%)	111/216 (51.4%)	250/484 (51.7%)
1996	145/264 (54.9%)	94/212 (44.3%)	239/476 (50.2%)
1995	126/278 (45.3%)	96/209 (45.9%)	222/487 (45.6%)
1995-1999	668/1335 (50.0%)	529/1082 (48.9%)	1197/2417 (49.5%)
1995-2004	361/2650 (51.4%)	1159/2351 (49.3%)	2520/5001 (50.4%)

*nonrandom at $p < 0.05$

CONCLUSIONS

It seems clear from our results that if betting NFL games under the Las Vegas total were a profitable strategy, it is at least a decade past its prime. Breakeven marks of 51.2 percent (2000-2004), 49.5 percent (1995-1999) and 50.4 percent (1995-2004) when betting under dismiss any notion of a recent under bias and suggest that bettors no longer overbet the over. We can also infer from our W/B ratios that unlike other biases that tend to overcorrect when discovered, no over bias has emerged. However, our most important contribution to the sports-betting literature may be that the failure to profit from totals wagers has less to do with market efficiency than with behavioral finance. Attempting to exploit totals perceived to be either understated or inflated is a good example of what behaviorists see as the folly of individuals acting on information which they regard as perfect in order to profit from mistakes committed by others acting on imperfect information. The field of behavioral finance promises new insights into the role of emotions and cognitive errors in the decision-making process of investors—and bettors!

ENDNOTES

1.   Bettors must win 11 of 21 wagers (or 52.4 percent) to break even since they risk $11 to win $10.
2.   the reverse of betting under on all NFL games in 1995

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