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Market Efficiency in Racetrack Betting: Further Evidence and a Correction*

We recently reported (Asch, Malkiel, and Quandt 1984) the results of simulated betting strategies based on logit analysis of racetrack betting data. Morning line odds, final odds, and marginal odds (defined as the odds implied by the moneys wagered during the last few minutes prior to each race) were used to predict the winning probability of each horse in a race; and a variety of strategies involving bets on the highest-probability horses was attempted. Our main conclusions were that we were unable to devise profitable strategies for win betting but that such strategies could be employed in place and show betting.

We have now run the same simulations on a new data set comprising 706 races for the summer 1984 harness meet at the Meadowlands Race-track. The logit estimations, in which winning probabilities are a function of combinations of morning line odds, final odds, and marginal odds, show coefficients remarkably similar to those of our earlier study, which was based on 1978 data for the Atlantic City Race Course. The rates of return to the place and show betting strategies, however, are substantially lower than those estimated with the 1978 data. Rerunning the simulations on the earlier data disclosed a computer programming error that had inflated the returns to place and show bets.¹

For each data set the sample of races was divided in half. Coefficients from each half sample were used to estimate probabilities of winning. These probabilities were used in simulated betting strate-

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1. The error in the simulations was as follows. When a successful place (or show) bet was made, the payoff credited to our hypothetical "account" was not necessarily that of the horse bet on but rather that of the *winning* horse. Since in the majority of such instances the winners were relative long shots, this error tended to inflate the rates of return.

TABLE 1 Rates of Return in Simulations Using Place Bets and Show Bets (Atlantic City)

	Run 4				Run 5			
	Estimation: First Half; Simulation: Second Half		Estimation: Second Half; Simulation: First Half		Estimation: First Half; Simulation: Second Half		Estimation: Second Half; Simulation: First Half	
	N	R	N	R	N	R	N	R
A. Place bets:								
Strategy 1	356	-.043	356	-.097	356	-.052	356	-.077
Strategy 2 ($B = .4$)	132	-.000	100	-.009	127	.021	107	.063
Strategy 2 ($B = .5$)	62	.023	57	.028	61	.017	58	.005
Strategy 2 ($B = .6$)	31	-.031	22	.109	28	-.077	22	.062
Strategy 3	52	-.049	51	.027	47	-.082	54	.106
B. Show bets:								
Strategy 1	356	-.037	356	-.102	356	-.041	356	-.100
Strategy 2 ($B = .4$)	132	.009	100	-.043	127	.019	107	-.006
Strategy 2 ($B = .5$)	62	.073	57	-.057	61	.035	58	-.053
Strategy 2 ($B = .6$)	31	-.019	22	.027	28	-.046	22	.005
Strategy 3	52	-.021	51	-.062	47	-.028	54	.016

TABLE 2 Rates of Return in Simulations Using Place Bets and Show Bets (Meadowlands)

	Run 4						Run 5					
	Estimation: First Half; Simulation: Second Half			Estimation: Second Half; Simulation: First Half			Estimation: First Half; Simulation: Second Half			Estimation: Second Half; Simulation: First Half		
	N	R		N	R		N	R		N	R	
A. Place bets:												
Strategy 1	353	-.142		353	-.080		353	-.168		353	-.091	
Strategy 2 ($B = .4$)	153	-.014		93	.039		150	-.041		82	.102	
Strategy 2 ($B = .5$)	100	.001		54	.037		99	-.000		47	.100	
Strategy 2 ($B = .6$)	57	-.028		32	-.066		63	.008		20	-.040	
Strategy 3	107	-.061		70	.019		102	.006		59	.134	
B. Show bets:												
Strategy 1	353	-.103		353	-.026		353	-.100		353	-.030	
Strategy 2 ($B = .4$)	153	.004		93	.068		150	-.014		82	.054	
Strategy 2 ($B = .5$)	100	.030		54	.027		99	-.011		47	.050	
Strategy 2 ($B = .6$)	57	-.003		32	-.114		63	-.007		20	-.082	
Strategy 3	107	-.015		70	.052		102	-.014		59	.162	

gies applied to the other half sample. In our 1984 paper, "run 4" used morning line and final odds as predictors; "run 5" used morning line and marginal odds. The betting strategies employed were:

Strategy 1: In each race, bet \$2.00 on the horse with the highest winning probability.

Strategy 2: In each race, bet \$2.00 on the horse with the highest winning probability if that probability equals or exceeds a "filter" coefficient (B).

Strategy 3: In each race, bet \$2.00 on the horse with the highest winning probability if that probability is at least 3.5 times as great as the probability of the horse with the second highest winning probability.

The earlier (incorrect) returns ranged from 0.127 to 0.527 on place bets and from 0.016 to 0.202 on show bets. The corrected returns, shown in table 1, range from -0.097 to 0.109 (place) and from -0.102 to 0.073 (show). The more recent (Meadowlands) rates of return, shown in table 2, are roughly comparable: the place-betting strategies yield returns from -0.168 to 0.134 ; for show betting, the range is from -0.114 to 0.162 .

Whereas rates of return to some of the place and show betting strategies remain positive, the majority appear close to zero. Our corrected conclusions are, accordingly, as follows. Profitable strategies for win bets cannot be devised on the basis of market data. The strategies we employ get us close to a fair game (far above the average rate of return, -0.185 , reflecting the track take) in place and show betting and do substantially better than the same strategies applied to win bets. The possibility of inefficiencies in place and show betting sufficiently large to permit profits remains open; but we are even more skeptical now about these possibilities than we were before. Finally, the similarities in the logit estimates over the two samples suggest that the information contained in racetrack betting data may be very much the same across times and locations.

References

- Asch, Peter; Malkiel, Burton G.; and Quandt, Richard E. 1984. Market efficiency in racetrack betting. *Journal of Business* 57 (April): 165-74.

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