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Horse Race Betting and the Stock Market

Abstract

I hypothesize that the stock market and the market for horse race betting move in the same direction. When the economy is strong and the stock market is having a positive year, the market for horse race betting will show an increase in total amount wagered. This paper will focus on equities markets compared to the market for horse race betting.

Horse Race Betting and the Stock Market

Kristin Smevold

I. Introduction

Studies have been performed examining the market for horse race betting because they possess many similar attributes compared to the financial markets. Snyder (1978) stated that “Both have common characteristics including those which form the basis for the theory of perfect competition: large numbers of participants, extensive market knowledge and ease of entry.” They are both good examples of perfectly competitive markets. There are a large number of participants. Prices react to reflect full and complete information. At the stock exchange, prices change constantly. At the racetrack this is also true. Tote boards display odds and are updated by the minute. There is also complete ease of entry and exit into both markets. Individuals participate by choice, and can leave whenever they choose. “The concept of ‘efficient markets’ refers to a perfectly competitive market where prices reflect all available information” (Snyder, 1978). For the reasons listed above, the stock market and the market for horse race betting are clearly efficient markets. Due to these similarities, I hypothesize that the stock market and the market for horse race betting move in the same direction. When the economy is strong and the stock market is having a positive year, the market for horse race betting will show an increase in total amount wagered.

The Stock Market:

This paper will focus on equities markets compared to the market for horse race betting. Individuals invest in particular companies with the hope that

these companies will prosper and the price of the stock will increase. Monday through Friday investors trade on the floors of the stock markets. If they see value in a company, there are a lot more buyers than sellers and the price of the stock increases. If the company is not performing up to standards, there are a lot more sellers than buyers and the price of the stock decreases. Investment in a stock is generally a long-term investment. A stock is held over time so that the company can acquire value and the price of the stock can increase.

Horse Race Betting Markets:

The market for horse race betting operates a little differently. It is a short-term investment. This study will focus on on-track betting. Races occur approximately every half-hour. A bettor knows within a half-hour if his bet has a positive return. Odds are posted on tote boards around the racetrack and are updated by the minute. The more people who bet on a horse, the lower the horses odds are. “For a race with a horse that is a 1:1 favorite, about 42 percent of the money bet is on the favorite (with a track take of 17 percent)” (Golec and Tamarkin, 1998). A horse with lower odds has a higher expected probability of winning, and will return a lower pay back. If few people bet on a horse, it has higher odds. A horse with higher odds will pay more to the bettor who holds a winning voucher. For example, on a \$2.00 bet, a horse with low odds (2:1) will pay on average \$3.00. A horse with high odds (25:1) will pay on average \$40.00.

Often times, horse race betting markets are

“When the economy is strong and the stock market is having a positive year, the market for horse race betting will show an increase in total amount wagered.”

examined because of their similarities to the stock market. Sauer (1998) says that wagering markets “provide a pricing mechanism for financial instruments in a context where outcomes are readily revealed and the scope of the pricing problem is reduced.” Horse odds are determined the same way a stock price is determined. A horse has lower odds if its underlying value supports it. A horse that has won more races or performed well in bigger races is more valuable. A company's stock price is determined based on its underlying value also. The stock price is determined by looking at a company's financial statements and product information. In this way, the pricing of a race horse and the pricing of a stock are similar; their prices are determined based on available information that gives them value.

“Like securities markets, horse racing offers an opportunity to study economic decision making under conditions of risk and uncertainty” (Snyder, 1978). This is yet another similarity between the two markets. I postulate there are two types of bettors and investors. Risk adverse bettors and investors will tend to invest in low-risk securities such as defensive or blue chip stocks. They will tend to bet on horses with low odds that have a greater probability of winning. Risk loving investors will be more aggressive and more apt to invest in technology stocks. Risk loving bettors will tend to bet on horses with higher odds. “Of course, they are more likely to lose part or all of their stakes, but the possibility of a large win is what lures them” (Golec and Tamarkin, 1998). The probability of winning is lower, but the expected return if the horse wins is greater.

In the stock market and the market for horse race betting, insiders may receive information that they can profit from. Snyder (1978) states “thus, horse racing in one more aspect is similar to the stock market where a knowledgeable ‘insider’ may be able to profit from their unique positions.” Company owners or owners of a horse can receive key information that can put them at an advantage over the betting or investing public. If they have more information than the average bettor or investor, they can be at an advantage. They can make a more informed decision about a bet on a horse or investment in a stock.

One last similarity to point out is that neither a bet nor an investment is free of charge. When an individual wins a bet, the payout is determined by the number of individuals who bet on the horse minus the track's percentage. The track does not pay out 100

percent but on average takes about twenty percent of the pool. Every time an individual makes a stock trade, their asset manager takes a percent. This percent varies, but is about 5 percent on average.

One difference to point out is that horse race betting is considered to be a zero sum game. Snyder (1978) concludes in his paper “that above average and positive profits cannot be expected from horse race betting, a conclusion which is similar to that reached for securities market.” Securities markets are not considered to give positive profits in the short run, but in the long run positive profits can be obtained. When an investment is held over time, it has positive and negative periods. In the long run it is feasible that the investment will acquire value. With horse race betting, it is always a short-term investment. It is not able to acquire value over time. Therefore, positive profits are not expected.

Sahlstrom and Nikkinen (2001) state that “the uncertainty related to the U. S. macroeconomic news releases directly affects stock and options valuation not only in the U. S. market but also in foreign markets.” If macroeconomic news affects our stock market as well as foreign markets, it seems probable it will affect other U. S. markets as well. Due to their similarities, I predict that the market for horse race betting will be effected in the same way the stock market is effected. During positive economic times, I hypothesize the stock market and the horse race betting market will increase.

Considering the similarities of the two markets it is feasible that they will behave the same. It has been proven that the stock market responds to economic indicators. “The major finding of the analysis is that the domestic macroeconomic activity affects the performance of the domestic stock market” (Hondroyannis and Papapetrou, 2001). The stock market responds favorably to positive economic announcements. Positive economic announcements, such as an increase in the Real GDP, drive the price of stocks up. Negative economic announcements, such as a rising unemployment rate, drive the price of stocks down. I hypothesize that the market for horse race betting will respond the same way. When the economy is doing well, individuals are more confident. I believe this makes them more likely to invest in securities or bet on horses. During booming economic times, there will be a greater number of people partaking in the horse race betting market. The volume of bets will go up. During economic slowdowns,

betting will slow. “The economy is in recession, declared by no less than the National Bureau of Economic Research, which says the longest expansion in U. S. history ended in March 2001” (Darrell, 2002). From the middle of 2001, the economy has been in a recession. Based upon my hypothesis, I intend to show that the market for horse race betting has suffered as well.

II. Theory

I intend to use basic supply and demand as my model. Positive economic indicators shift the demand for equities to the right. The quantity demanded will increase as well as the price. Typically volume traded increases as well. You can not judge the stock market by volume because volume can increase when there is a large sell off as well.

The market for horse race betting is easier to judge by volume. As demand increases, the volume of bets increase and the total amount wagered increases. With an increase in the betting pool the average payout increases. This is because the larger the number of bettors, the more spread out the betting pool will be. This means that with a larger number of bettors, there will be more money on the favorite and it will pay out less. There will be less money spread out across horses with higher odds, and they will pay out more. Assuming my hypothesis is correct, demand for horse race betting will shift right when the economy is doing well and positive economic news is being released. Negative economic indicators or an economy in recession will shift the demand for horse racing left. This may not be as immediate as the stock market since most horse race betting is done on the weekends. The stock market reacts instantaneously, while there will be a lag in the market for horse race betting.

In the short run, I assume that the supply of racehorses is fixed. New racehorses can not appear out of nowhere. They need to be bred, raised and then trained to run in races. This is a long process; therefore, the supply is fixed in the short run. I assume the supply of stocks is also fixed in the short run. It takes a lot of time and preparation to start up a company. It also takes a long time for an existing company to extend their offerings through investment bankers and therefore become eligible to be traded on the markets. Therefore there can not be a large influx of new companies in the short run.

I intend to look at the years of 1984-2001.

Both markets have shown increases and decreases since then. I predict that the markets will follow the same trends, and move in the same direction. Since the middle of 2001, the economy has been in a deepening recession. I predict the demand for horse race betting will have suffered as well. The demand for the market of horse race betting and the demand for investing in the stock market will have both shifted to the left.

It is a possibility; however, that these two markets will prove to be substitutes. During a bear market, the market for horse racing may show an increase in activity. Investors may shift their money from the stock market to the market for horse racing because they feel they have a better chance to receive a positive gain. If this is the case, the demand for the stock market and the demand for horse race betting will shift in opposite directions.

III. Data

Data for the stock market is easily obtained. I used the Standard & Poors 500 (S&P 500) and the Dow Jones Industrial Average (DJIA). The DJIA is the most widely used indicator used to look at the overall condition of the stock market. It is a price-weighted average of 30 actively traded blue chip stocks. These stocks are primarily industrial. The S&P 500 is a diverse basket of 500 stocks that are considered to be widely held. It is determined each day using the closing market value. The S&P 500 and the DJIA are considered to be good representations of the stock market as a whole. I will look at yearly percentage increases or decreases since 1984. These figures are based on the yearly closing values of December 31 on the DJIA and the S&P 500. By using data since 1984, I should be able to examine different trends in the stock market. Note that there have been positive and negative years for the S&P 500 and the DJIA averages since them. Table 1 gives the yearly closing value and percentage change since 1984.

Data from the racetracks is also easily obtained. By looking at different meets at different tracks, I will be able to compare them to the stock market. I intend to look at all of the thoroughbred tracks in Illinois. Looking at more than one racetrack will give a better picture and more substantial results. Data obtained represents the yearly wagering totals for all of the tracks combined. Wagering totals represent on track wagering totals only. There are four

Table 1: Yearly Changes in the DJIA and the S&P 500

Year	DJIA 12/31	% Change	S&P 500 12/31	% Change
1984	1211.57	*	167.24	**
1985	1546.67	27.66%	211.28	26.33%
1986	1895.95	22.58%	242.17	14.62%
1987	1938.83	2.26%	247.09	2.03%
1988	2168.57	11.85%	277.72	12.40%
1989	2753.2	26.96%	353.4	27.25%
1990	2633.7	-4.34%	330.22	-6.56%
1991	3168.8	20.32%	417.09	26.31%
1992	3301.1	4.18%	435.71	4.46%
1993	3754.1	13.72%	466.45	7.06%
1994	3834.4	2.14%	459.27	-1.54%
1995	5117.1	33.45%	615.93	34.11%
1996	6448.3	26.01%	740.74	20.26%
1997	7908.3	22.64%	970.43	31.01%
1998	9181.4	16.10%	1229.23	26.67%
1999	11497.1	25.22%	1469.25	19.53%
2000	10788	-6.17%	1320.28	-10.14%
2001	10021.6	-7.10%	1148.08	-13.04%

*Data for DJIA 1984-1989 from Marketwatch.com

** DJIA data 1989 on and all S&P 500 data from finance.yahoo.com

thoroughbred tracks in Illinois: Arlington Park, Sportsman's Park, Hawthorne Race Course, and Fairmount Park. This study focuses only on on-track wagering totals because off track wagering figures can come from bets places not only outside of Illinois, but outside of the United States as well. People can simulcast and bet on tracks around the world. Since this study focuses on the United States stock market, I choose to use on track data to avoid internationally placed bets on Illinois tracks. Table 2 shows the yearly wagering totals and percentage change at all four race-tracks combined since 1984. Note that Illinois tracks show increases and decreases over the period examined as well.

Table 2: Yearly Change Illinois tracks

Year	Track Totals	% Change
1984	439,850,028	*
1985	413,499,578	-5.99%
1986	336,067,733	-18.73%
1987	356,421,707	6.06%
1988	300,440,988	-15.71%
1989	362,027,974	20.50%
1990	358,258,669	-1.04%
1991	337,354,770	-5.83%
1992	311,469,954	-7.67%
1993	285,304,997	-8.40%
1994	269,292,713	-5.61%
1995	208,971,670	-22.40%
1996	224,480,978	7.42%
1997	203,602,521	-9.30%
1998	145,599,880	-28.49%
1999	137,231,659	-5.75%
2000	183,746,086	33.89%
2001	175,914,328	-4.26%

*Data obtained from the Illinois Racing Board

I intend to compare the changes in the DJIA and the S&P 500 to changes in the total wagering pool for on track thoroughbred race betting in Illinois. By looking at the data in Table 1 and Table 2, it appears to be contrary to my hypothesis. When the stock market percentages increase (Table 1), it appears that the percentage of total wagering dollars decreases (Table 2). Examining years with large percentage changes at the racetracks furthers this evidence. In the year 1995, total wagering totals at Illinois tracks decreased by 22.40%. The DJIA increased 33.45% and the S&P 500 increased 34.11%. In the year 2000, Illinois tracks suffered a large increase in wagering totals (33.89%). During this period, the DJIA decreased 6.17% and the S&P 500 decreased 10.14%. Looking at these preliminary find-

ings, it appears my hypothesis will be proven incorrect. I will not have conclusive results until further tests are run, for now I will keep my original hypothesis; demand for horse race betting and demand for investing in the stock market will shift the same way.

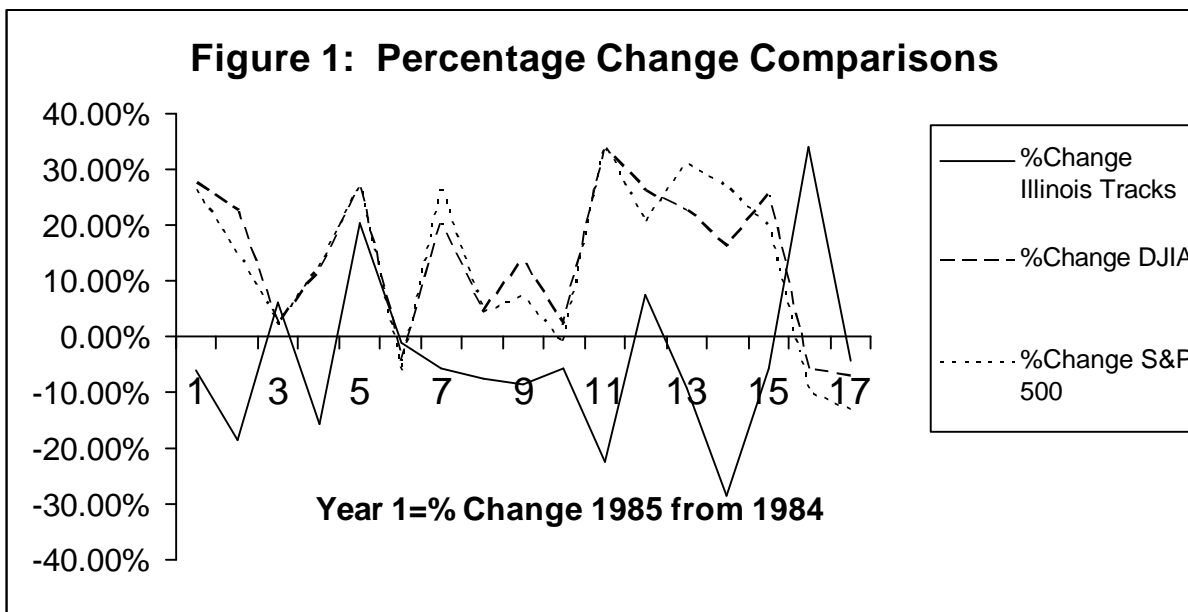
IV. Empirical Model

During economic booms, I propose that demand will increase in the stock market and the market for horse race betting. Increases in demand will be shown through an increase in prices at the stock market. In the market for horse race betting it will be shown by an increase in wagering totals, which will lead to a higher payout on bets. I will use statistical comparisons to test my hypothesis. I will compare yearly increases or decreases of the DJIA and the S&P 500 to the increases or decreases of total wagering dollars at Illinois thoroughbred tracks. I will be looking at the time period from 1984 to 2001.

I will run a correlation to find out if these markets move in the same direction. I will correlate the DJIA with total wagering amounts at Illinois thoroughbred tracks. I will also correlate the S&P 500 with total wagering amounts at Illinois thoroughbred tracks. From my hypothesis, I expect to find a positive correlation from both tests. A positive correlation will show that the stock market and the market for horse race betting move in the same direction. A finding that the two markets move together would suggest that demand for horse race betting and investing in the stock market move in the same direction based on the conditions of the economy.

V. Results

I predicted that the markets for horse race betting will move in the same direction as the stock market. I did this using comparative statistics, the DJIA and the S&P 500 to the total wagering amounts at Illinois thoroughbred tracks. Contrary to my hypothesis, I found a negative correlation between Illinois tracks and the DJIA. The correlation between the DJIA and Illinois tracks was -0.915. I also found a negative correlation between Illinois tracks and the S&P 500. The correlation between Illinois tracks and the S&P 500 was -0.919. These figures represent a strong negative correlation between Illinois tracks and the DJIA and the S&P 500. Both correlation coefficients were significant to a .001 level according to a two tailed significance test. This is highly significant. This means that there is a very low probability of error. From this one can conclude that the DJIA and the S&P 500 move in opposite directions from wagering at Illinois tracks. This seems to show that the two goods do not respond in the same way to macroeconomic indicators. A positive macroeconomic figure, such as GDP growth of 5%, would drive stock prices up. Due to the negative correlation, the market for horse race betting would move in the opposite direction. The correlation coefficients show that the stock indexes are inversely related to Illinois race track revenues. When the stock market increases, horse race wagering totals decrease. When the stock market decreases, horse race wagering totals increase. Figure 1 illustrates this point.



Looking at the chart one can see that the Illinois tracks move opposite the DJIA and the S&P 500. Large increases in either the S&P 500 or the DJIA tend to correspond to large decreases in wagering totals at Illinois tracks. Large increases at Illinois tracks tend to correspond with decreases in the S&P 500 or the DJIA. This furthers the proof that Illinois tracks are inversely related to the stock market. Due to the strong negative correlation, when the stock market is doing well, the market for horse race betting suffers. When the market for horse race betting is thriving, the stock market is suffering. These results are contrary to my hypothesis, but I did predict that this result could be possible.

VI. Conclusion

I predicted that the stock market and the market for horse race betting move the same way. During stock market downturns, both markets were hypothesized to suffer. During stock market booms, both markets were hypothesized to benefit as investors and bettors are more confident in the economic position. They should be more willing to risk the money they have for a chance of gain.

However, my results proved to be contrary to my hypothesis. There was a strong negative correlation between the DJIA and the market for horse race betting and a strong negative correlation between the S&P 500 and the market for horse race betting. From this I conclude that the two markets are inversely related. During stock market booms, people are more likely to invest in the stock market than bet on a racehorse. During stock market slowdowns, people are more likely to take the chance and bet on a horse than invest in the stock market. During these times, people feel that the return from betting on a horse will be greater than the return they would receive investing in a bear market.

In 2000, the economy was just entering recession. The stock market saw negative returns for the first time in five years. At this time, the betting market for Illinois thoroughbreds showed a 33.89% increase. This was the first increase in the betting market for a period of three years. In 2001, the economy moved deeper into recession. The DJIA dropped 7.10% and the S&P 500 dropped 13.04%. The wagering market decreased, but only by 4.26%. From two years earlier, the market for horse race betting is up 29.63%, while the DJIA is down 13.27% and the S&P is down 23.28%. Since the economy

has entered recession, the market for betting in Illinois has shown a large increase in wagering totals. While the economy has been suffering, with negative macroeconomic announcements and a declining stock market, the on-track horse racing market has increased.

While the stock market was prospering, the horse race betting market faced severe declines in wagering totals. In 1998, the DJIA was up 16.1% and the S&P 500 was up 26.67%. This is one of the biggest increases in the eighteen years that I examined. During this year, the market for horse race betting suffered a large decrease. Wagering totals dropped 28.49%, the biggest decrease in the years of this study. While the stock market boomed, the market for horse race wagering suffered.

Looking farther than Illinois, it seems that other tracks face the same results. Churchill Downs spring meet set wagering records. Recorded by Churchill Downs (2002), they boast that "boosted by record-shattering business on the Kentucky Derby, total wagering on races during the Churchill Downs 2002 Spring Meet soared past the \$500 million mark for the third consecutive year." The United States has been in a continued recession and the stock market has continued to suffer. Yet the markets for horse race betting are still holding strong. Over the last three years, Churchill Downs has been prosperous.

This is important because it helps us to understand trends in the stock market compared to trends in the market for horse race betting. During bear markets, investors lack confidence. There are more sellers than buyers as the price of stocks decrease. People move their money out of the stock market and try to make profits elsewhere. The demand for investing in the stock market shifts to the left. They are more willing to take a chance and bet on a horse than to keep their money in a faltering stock market and the demand for horse race wagering shifts to the right. During a bull market, investors have greater confidence. They do not want to take the risk of trying their luck at a zero sum game, but expect positive returns from their investments in the stock market. Their money moves back into the stock market and once again there are more buyers than sellers and the stock prices are driven up. The demand for investing in the stock market shifts to the right, while the demand for wagering on horses shifts to the left.

The economy has been in a recession since

the middle of 2000. The DJIA and the S&P 500 closed negatively in the first time for several years. During this year, the stock market saw a large increase in Illinois horse race wagering markets. Though the economy has yet to come out of recession, the Federal Reserve has become optimistic that the most recent interest rate cuts will pull the economy out of recession. From my findings, I expect to see the market for Illinois horse race wagering begins to decrease as the economy comes out of recession. Due to the strong negative correlation, as the stock market improves in the long run, the market for horse race wagering will begin to suffer. This will not be permanent. Business cycles experience many expansions and contractions. One can not believe that the stock market will come out of recession and never face a set back again. When the economy once again begins to slow and the DJIA and S&P 500 decrease, one can expect to see an increase in horse race wagering in Illinois.

My hypothesis was proved to be incorrect. The markets for horse race betting and the stock market do not move in the same direction. Instead, there is a strong negative correlation between the two markets. The market for horse race betting moves in the opposite direction of the stock market. One will be more likely to wager on a horse race when the stock market is not doing well. When the stock market is doing well, an individual will be less likely to wager on a horse race.

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