

RISK-TAKING, GAMBLING, SPECULATION, AND A BEHAVIORAL INTERPRETATION OF MARKET PSYCHOLOGY

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ABSTRACT

Economic theory fails to adequately explain the appeal of gambling. Although most economists believe the market to be reasonably efficient, security markets are studies in excess. Speculative bubbles occur from time to time. Prices overshoot intrinsic value in both directions. Despite the widespread evidence that momentum in prices is largely a statistical illusion for most firms, many investors act as if it were real, thus the appeal of technical approaches as trading strategies.

Although not effectively explained by economic theory, all of these phenomena are consistent with results one would expect given the implications of behavioral psychology.

INTRODUCTION

Economists use theoretical constructs called utility functions to try to explain much economic behavior including risk-taking. Friedman and Savage (1948) tried to use a “kinked” utility function to show that it was not necessarily irrational to for an investor to be both risk adverse and also have risk proclivity. The same rational investor would buy insurance against some risks but might also buy lottery tickets. It is difficult to imagine a utility function however, which is consistent with the behavior of a typical gambler who accepts many relatively small wagers, each with negative expected value. Such conduct diversifies away most of the risk inherent in each separate wager and creates an increasing likelihood of loss. When faced with evidence of such behavior, for example typical Las Vegas gambling, the economist may explain the behavior as “consumption” since it is obviously not “investment”. This gambling behavior is, however, easily explainable by behavioral psychology.

CONDITIONED RESPONSE

Building on the work of Edward Thorndike, John Watson, and others, Burrus Fredrick Skinner published “The Behavior of Organisms” in 1938. He continued in this work (publishing a total of twenty books and numerous articles) until his death in 1990. The mechanism described is operant conditioning. An animal, which is less than perfectly satisfied, will engage in behavior. The behavior may be either directed toward a goal or random in nature. If that action is followed by a reward, it will be repeated more often in the future. Examples of a reward are food and attention. If an action is followed by a punishment, it is repeated less often in the future. Electric shock is one example of a punishment. This reinforcement mechanism is called a conditioned response.

As an example of a conditioned response, a bird may be trained to walk in a figure eight by feeding it a bit as it completes partial circles at random. After the bird is trained to walk in full circles, the reward is withheld until it completes a circle and begins to reverse direction. A skilled trainer may quickly have the bird walking in figure eights. Note that observation of the untrained bird would show a few figure eights at random over a sufficiently long period. After training, the frequency of figure eights would be considerably higher.

EXTINCTION OF THE CONDITIONED RESPONSE

If the action stops being followed by a reward, the frequency of the action will diminish. In the example of the bird, if the trainer withholds food, the bird will gradually reduce the frequency of the figure eights until, eventually, it approaches that of the unconditioned bird.

INTERMITTENT REINFORCEMENT

It has been found that actions that are only intermittently followed by rewards are better conditioned against extinction than those that are continuously reinforced. A bird, which is trained to walk in figure eights by intermittent feeding, will continue that behavior after the reward is withheld much longer than the bird that is continuously rewarded.

PUNISHMENT

Animals may be trained to perform or avoid an action by punishment such as electric shock. The animal is shocked when it does or does not perform the action. When the shock is withdrawn, the conditioning extinguishes rapidly. In other words, rewards condition against extinction better than punishments. A high ratio of rewards to punishments is most effective.

SUPERSTITIOUS BEHAVIOR

It is important that there is a temporal relationship between the animal's action and the reward. It is not important that there is a causal relationship between the action and the reward. An animal, which is frustrated in some way, will engage in behavior. This behavior may even be random. When some outside event causes the animal to be rewarded, the behavior is inadvertently reinforced. Since there is no causal relationship between the behavior and the reward, such behavior won't be reinforced every time but it may be intermittently reinforced.

GAMBLING

People respond to conditioning much as other animals do. Las Vegas style gambling is a classic intermittent reinforcer with money as a reward. The gambler wins some and loses some but rewards condition against extinction better than punishments. Intermittent rewards condition against extinction better than continuous rewards. Any gambling strategy is intermittently rewarded. Although the probabilities are knowable and the expected value is negative, people are still attracted

to gambling. A “rational person” would not make a series of similarly sized wagers, each with negative expected value but many people do each day. The attraction of gambling is not explainable by economics but it is consistent with the implications of behavioral psychology.

INVESTING

Investing has a more positive connotation than gambling. Investors know that, unlike gamblers, investors are “winners”. Over the long term, investment in large firms has earned over ten percent per year. If the intermittent reinforcement of gambling is attractive, the intermittent reinforcement of investing is nearly irresistible! The more frequently one trades, the greater the conditioning effect.

TRADING STRATEGIES

Despite evidence that past stock market information may not normally be used to predict future prices in a profitable way, many investors think of the market as having momentum. For example, all technical tools are based on the assumption that past price and volume data may be used to predict future prices. The behavioral framework would tend to suggest this. However, countering this effect would be the actions of analysts. Haugen (1997) concludes that the vast majority of studies which have purported to support this notion have either employed defective methodologies or have “discovered” rules which appear to work on historical data but fail to work in subsequent periods. Malkiel (1999) says that he personally, “has never known a successful technician but he has seen the wrecks of several unsuccessful ones.” Hong (2000) does show that momentum strategies may have been profitable for smaller firms with little analyst coverage. This study also shows that momentum seemed to have disappeared by the period 1991-1996.

Why is short term trading so popular if there are transactions costs and it doesn't usually lead to extraordinary profits? The appeal is easily understandable in the context of the operant conditioning model. Any strategy works occasionally and is therefore intermittently reinforced. The more often one trades, the more one is affected. Unless the investor is careful to calculate returns after trading costs and to compare these returns to what could have been earned elsewhere at the same risk level, he will never even know that he is earning substandard returns. If one can be conditioned to “invest” in slot machines, consider how much easier it is to be conditioned to follow superstitious investment policies. Unlike gambling, where the expected value is negative, investing in stocks is expected to lead to a positive expected value.

SPECULATIVE BUBBLES

A speculative bubble is said to exist when the price of an asset rises to such a height that investors buy that asset only to trade. In such a market, no one would want to be the “ultimate holder”. Any discussion of bubbles invariably cites the “tulip mania” of mid seventeenth century Holland. Charles Mackay (1841) documented this famous speculative bubble. Prices of tulips grew to the point where a single bulb traded for twelve acres of prime building ground! How was it possible for an investor to pay such a high price for a single tulip? It seems obvious that no one would

want a single flower enough to pay that high a price simply to enjoy owning it. The investor presumably bought the flower in the hopes of selling it for a profit. When prices reach such inflated levels, investors are merely playing “musical chairs” with money. The last one holding the asset loses! In the case of tulips, there was no “soft landing”. When the bubble burst, prices fell faster than they had risen. Investors defaulted on futures contracts and loans. The resulting massive contraction of credit caused a long-lasting depression and no one in the country was spared.

Consider the modern stock market. The intrinsic value of stocks comes from their ability to pay dividends. Rapidly growing firms may forgo dividends until their growth slows. However, eventually all firms must mature, none can grow faster than the economy forever. The intrinsic value of a growth firm comes from the prospect that it will pay dividends after maturity. No one would want to be the ultimate holder of a firm which could never pay adequate dividends to justify the price.

A speculative bubble preceded the great crash of 1929. The great depression and World War II followed. Each postwar decade has manifested at least one speculative bubble in the stock market. Each time, faced with new possibilities, investors convince themselves that “this time it’s really different”. Initial enthusiasm for an investment area would lead to price increases. It is in the nature of such bubbles that investors have simply copied actions that had been profitable in the past. Dunn (1999) showed that firms with low profitability but sufficiently high stock prices could generate growth through reverse dilution by selling stock. The speculative process would thus become (temporarily) self-justifying and the bubble’s effects would be extended.

Investors today are influenced by the past perhaps more than the probable future. The bull market of the past ten years has created a climate where every investment strategy has been reinforced. Indeed, many of today’s investors have never seen a period of decline in the stock market last longer than a few months. It was said of the late 1920s that the people making the most in the market knew the least about it. The same may be true now.

CONCLUSIONS

There are both positive and normative implications of this analysis. The behavioral model is consistent with the popularity of technical trading strategies based on past stock market performance whether or not such strategies actually generate exceptional returns. The conditioning effect of past trends in the market might lead to momentum, particularly in the case of smaller, less closely followed, firms. Speculative bubbles reappear regularly. Tests of modern portfolio theory show that the actual relationship between returns and risk (measured by Beta) are not what the MPT theory would suggest. Investors seem to be less adverse to risk than the CAPM would suggest. A possible explanation for this is that the variation in returns caused by risk works as an intermittent reinforcer.

The normative conclusions are clear. The burden of proof should be on any proposed trading strategy. Trading will definitely result in intermittent reinforcement and a conditioning effect similar to gambling. Firms that use high market valuations to generate growth through reverse dilution will attract a “following”. Investors attracted by the past growth may push valuations even higher. The resulting stock price may be totally unrelated to any reasonable expectation of future performance. Such a process must end eventually because it is, mathematically, like a pyramid scheme. An investor may avoid being drawn into a speculative bubble by focusing on the intrinsic value of an investment.

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