

Lottery Traders

by

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Abstract

The behavior of stock traders and lottery buyers teaches us about our common aspirations, thoughts and emotions. That behavior also helps us answer the many questions of finance such as the construction of portfolios and the nature of equity premium.

Lottery Traders

“Someone is going to win the lottery,” says an E*Trade advertisement, “Just not you.” Stock traders poke fun at lottery buyers, but the two have much in common. Indeed, the behavior of stock traders and lottery buyers teaches us much about our aspirations, thoughts and emotions. That behavior also helps us answer the many questions of finance, such as the construction of portfolios and the nature of the equity premium.

More than 50 years ago, Friedman and Savage (1948) noted that risk-aversion and risk-seeking share roles in our behavior; people who buy insurance policies often buy lottery tickets as well. Four years later, Markowitz (1952a, 1952b) wrote two papers. In one he extended Friedman and Savage’s insurance-lottery framework while in the other he created the mean-variance framework. People in the mean-variance framework, unlike people in the insurance-lottery framework, never buy lottery tickets; they are always risk-averse, never risk seeking.

Markowitz (1984, 2000) noted the difference between the mean-variance framework and the insurance-lottery framework. The mean-variance framework *prescribes* behavior while insurance-lottery framework *describes* behavior. The mean-variance framework is built on the premise that risk-averse behavior, such as buying insurance, is wise while risk-seeking behavior, such as buying lotteries, is foolish. In contrast, the insurance-lottery framework is built on the premise that whether foolish or wise, people buy lotteries, not just insurance. But on its way from 1952 to the present, Markowitz’s prescriptive mean-variance framework turned into a descriptive framework. Today’s financial theory is built on the premise that investors *are* always risk-averse.

It is easier to banish risk-seeking from financial theory than from our behavior. As Bernstein (1996) notes, gambling is drawing more people than baseball parks or movie theatres and gambling is evident in the investment arena as well, much beyond the behavior of day

traders. We impoverish our understanding of investment behavior when we exclude risk-seeking from our descriptions. We also impoverish our understanding of investment behavior when we exclude from it aspects such as hope, camaraderie and fun. We include them here as we describe the aspirations, thoughts and emotions that animate investors.

Why do we trade stocks and buy lottery tickets?

All lottery money comes from the pockets of lottery buyers. Some win, some lose, but the total amount that winners receive is less than the amount that losers pay. This is because lottery administrators take some of the money for expenses and transfer some to the state treasury. Christiansen (1987) estimated that lottery buyers receive, on average, only 49 cent of every dollar they pay. So the expected return of a lottery ticket is negative, a 51 percent loss. Lottery buying is a negative-sum game.

Stock trading, like lottery buying, is a negative-sum game. But while the frame of lottery-buying as a negative-sum game is transparent, the frame of stock trading as the same game is opaque. As Treynor (Bagehot, 1971) noted, people confuse the stock-holding game with the stock-trading game. The stock holding game is a positive-sum game; buyers of stocks can expect to receive, on average, more than they spend. However, the stock trading game is a negative-sum game. In the absence of trading costs, management fees and expenses, stock traders can expect to match the returns of an index of all stocks. But they can expect to lag that index once trading costs are considered. Indeed, Barber and Odean (2000a) found that, on average, stock traders lagged the market and the magnitude of the lag increased with the amount of trading.

Lottery buying and stock trading are common in practice but they are puzzles in standard financial theory. Lotteries are a puzzle since, according to standard financial theory, people are averse to risk; they are willing to take risk only on investments that offer sufficiently high expected returns. So why do people buy lottery tickets that offer high risk with negative

expected returns? Trading is a puzzle since, as Milgrom and Stokey (1982) noted, a trader's offer to trade should raise suspicion in his fellow traders that he has superior, perhaps inside, information. Rational traders refuse to trade under such conditions, and no trading takes place. Kyle (1985) used liquidity traders to get out of the no-trading trap. Liquidity traders have no information and trade only because they have too much liquidity or too little. However, Subrahmanyam (1991) showed that rational liquidity traders would trade only baskets of securities, avoiding trades in individual securities. But who will trade individual securities if all traders are rational?

Treynor (Bagehot 1971) and Black (1986) offered two solutions to the trading puzzle. First, perhaps traders think that they are all above average; they might all think that they have superior information or skill. Second, perhaps traders simply like to trade. Friedman and Savage (1948) offered a third solution, in the context of lotteries. "Men will and do take great risks to distinguish themselves, even when they know what the risks are," they wrote (p. 299). Perhaps people trade stocks and buy lottery tickets because these offer the only of rising from the working class to the middle or the upper class.

We think that we are above average

Investors expected, on average, that the stock market will provide a mean 10.3 percent return during the following 12 months, according to the May 2001 Gallup/PaineWebber survey of individual investors (2001). But they expected that their *own* portfolios will provide a mean 11.7 percent. Investors expect, on average, to be above average. The unrealistic optimism that people display in the investment arena is similar to the unrealistic optimism they display in other arenas. Taylor and Brown (1988) reported that people expect higher than average satisfaction in their first job, higher than average salaries and higher than average likelihood of having gifted children. They also expect lower than average likelihood of being crime victims, having trouble

finding a job or becoming ill. “In effect,” wrote Taylor and Brown (1988), “most people seem to be saying ‘The future will be great, especially for me.’ Because everyone’s future cannot be rosier than their peers, the extreme optimism that people display appears to be illusionary.” (p 197).

Moore et al (1999) found, in trading experiments, that people overestimated the future performance of their investments relative to the market. This is a reflection of unrealistic optimism, consistent with the Gallup/PaineWebber empirical findings. They also found that people even overestimated the *past* performance of their own investments relative to the market. This is consistent with Goetzmann and Peles’ (1997) finding that a group of the American Association of Individual Investors (AAII) overestimated their own investment performance by an average of 3.40% and overestimated their own performance relative to the market by 5.11%.

The belief that we are all above average is common, but promoters of both lotteries and trading find ways to bolster it. Clotfelter and Cook (1991) report that 70% of lottery players displayed in advertisements were winners. The exaggerated proportion of lottery winners trips viewers into the availability heuristic, leading them to overestimate the likelihood of winning. Promoters of mutual funds use similar methods.

Consider, for example, an advertisement by the Strong group of mutual funds in the July 2000 issue of Kiplinger’s Personal Finance. The advertisement features the performance of two growth and income funds, The Strong Blue Chip 100 Fund the Strong Growth and Income Fund. The first earned a 37.00% return for the year ending on March 31, 2000 while the second earned 33.68%. It turns out that the two growth and income funds promoted by Strong are the ones with the highest returns among the nine growth and income funds listed on Strong’s web site.

Promoters of lotteries also use hindsight bias, our tendency to conclude that what actually happened was bound to happen, to bolster the belief that players will be winners. Clotfelter and

Cook (1991) described a television advertisement for the Connecticut lottery showing an older man fishing in a lovely mountain lake. He says:

When I was younger, I suppose I could have done more to plan my future.
But I didn't
Or I could've have made some smart investments.
But I didn't.
Heck, I could have bought a one-dollar Connecticut Lotto ticket, won a jackpot
worth millions and gotten a nice, big check every year for 20 years.
And I did!

Similarly, a television advertisement for online stock trading by Discovery Brokerage shows a tow truck driver with the passenger whose car he tows. An issue of Barron's is on the seat between them.

Passenger: You read Barron's?
Driver: Oh yeah, all the time. That's the one where they rate all the on-line brokers. I use Discover Brokerage. They have been Barron's top pick for the, like, last three years.
Passenger: You invest on-line?
Driver: Oh yeah, big time. Well, last few years anyway. I am retired now.
Passenger: You are retired?
Driver: I do not need to do this, I just like helping people.
Passenger notices picture of island near the rearview mirror.
Passenger: Vacation spot?
Driver: Actually, it's a picture of my house.
Passenger: It's an island.
Driver: Well, technically it's a country.
Driver: Weird thing about owning your own country though, you have to name it.

Lottery promoters encourage players to be overconfident of their skills. Clotfelter and Cook (1991) describe a lottery advertisement that instructed viewers to bet the numbers on the uniforms of their favorite sports heroes. "This is how our winner of \$10.7 million did it." Likewise, trading promoters encourage traders to be overconfident of their skills. A television advertisement by Suretrade, an online broker, shows a sequence of people who say:

We don't keep ourselves at a safe distance

We don't have blind faith
We read
We listen
We learn
We plan to retire rich
An announcer concludes:
Suretrade.com
The smart tool for smart investors

Members of investment clubs, like lottery players and online traders, have formulas for winning. Woolley (2000) described the members of the Beehive investment club who bought shares of Uno Restaurant after a member served its pizza at a club meeting. The members concluded that the pizza was great and the stock was cheap. However, trading formulas bring to investment clubs more losses than gains. Barber and Odean (2000b) found that, on average, those of investment clubs lag the returns of the market.

We have aspirations

After buying a lottery ticket, writes Pope (1983), people “can dream from age nineteen to ninety-nine that they will become millionaires after the next drawing.” (p. 156).

All people have aspirations. Some people who aspire to be millionaires can expect to reach their aspiration level through steady contributions to IRA and 410(k) accounts. But for others, stock trading and lottery buying offer the only chance.

Betting on the Market, a PBS Frontline program (1997), shows Sharon and Russ, a young couple who own a carpet store. Sharon and Russ have no pension plan and almost all their savings are in the stock market. They watch CNBC constantly and trade frequently. “We are trying to make some aggressive money very quickly,” says Sharon. “Russ works hard, it’s almost demeaning that he works this physically hard. It should be more mental.”

Sharon and Russ live in a modest house, but they have high aspirations. “This is our dream house...” says Sharon, pointing to blueprints of a fancy house. “We look at it when we are off to work in the morning and when we come home tired... Isn’t it beautiful...”

Clotfelter and Cook (1989) quote a lottery player in a poor neighborhood on Chicago’s West Side with aspirations that exceed his resources. “I’ve dug so many holes for myself over the years that realistically, winning the lottery may be my only ticket out.” (p. 75).

Brenner and Brenner (1987) found that poor people are over-represented among lottery players and so are people whose realized wealth is significantly lower than their aspiration levels, due to illness, accident, or loss of a job. Devereaux (1949) notes that a “well adjusted middle class salaried employee may lose his job for a variety of causes that lie partially or wholly beyond his control... excessive gambling may appear as one of the by-products of this sequence.” (p. 807).

The people that Brenner and Brenner describe are people in the domain of losses, people whose wealth is short of their aspiration levels. Kahneman and Tversky (1979) found that people in the domain of losses accept gambles that they reject when they are in the domain of gains. People in the domain of losses are people who, in the language of the Chicago lottery player, have “dug so many holes” for themselves they gamble because they want a “ticket out” of poverty, not because they like risk.

Some people who suffer declines in their financial position turn to the lottery while others turn to day-trading. Simon and Browning (2000) tell the day-trading story of Dr. David Gleitman, a 46-year old podiatrist. Dr. Gleitman earned about \$200,000 a year from his medical practice in the late 1980’s, but that was before insurance companies reduced to \$800 the reimbursement for surgeries that once commanded \$4,000. Now Dr. Gleitman suffers patients who complain about \$10 co-payments for toenail clipping. His medical practice income has

declined to less than a quarter of its past \$200,000 because of lower insurance reimbursements and less time devoted to his practice. Now Dr. Gleitman spends most of his time trading stocks online, using margin. The March-April 2000 plunge in the market cost him roughly \$1 million, or close to 80% of his portfolio's value.

Tony Auth captured well the link between day-trading and lotteries in a cartoon that appeared shortly after the North American Securities Administrators Association, Inc. (1999) reported that 70% of day traders lose money.

Government Employee: This is terrible!!

More and more of our citizens are becoming addicted to 'day trading'.....

They all think they'll get rich, but 70 % of them lose money....

As they go further into debt, they run up huge credit card debt, always thinking they're one trade away from hitting the jackpot....

It's so stupid! They should cut out all this day-trading nonsense.....

.... And play the state lotteries.

We have emotions

Hope and fear might be the strongest emotions that drive lottery buyers and stock traders, but regret is not far behind. Regret is the pain that we feel when we find, too late, that a different choice would have led to a better outcome. Aversion to the pain of regret affects our choices.

Bar-Hillel and Neter (1996) found, in experiments, that people are more reluctant to exchange lottery tickets than other items, such as pens. They attribute the reluctance to aversion to regret; how would you feel if "your" lottery ticket won in the hands of someone else?

Lottery promoters capitalize on the aversion to regret as they encourage lottery buyers to keep on buying. "Don't let your number win without you," says a lottery slogan noted by

Clotfelter and Cook (1991). They also noted a Missouri lottery advertisement that plays on the same aversion: A lottery ticket blows out of a farmer's hand into the nearby cow pasture. Several days later the farmer sees one of his cows riding in the back seat of a luxurious stretch limo. We see the farmer's pain of regret when he realizes that his cow won the jackpot that would have been his.

Aversion to regret plays an important role in trading behavior as well. In particular, it underlies the reluctance to realize losses, as described by Shefrin and Statman (1985). Aversion to regret is bad for stockbrokers, since investors who hold on to losing stocks do not trade. However, aversion to regret is good for poorly performing mutual funds. McGough and Siconolfi (1997) described investors in the Steadman mutual funds who continue to hold on to Steadman shares bought 20 years ago. The shares register paper losses, and the losses are likely to deepen because the Steadman funds have expense ratios of 25 percent a year. Still, said a Steadman investor, he "never wanted to sell it at a loss."

We like it

"Casino visitors," writes Goodman (2000), "find themselves part of a welcoming community with one thing on its collective mind." Camaraderie, he added, is what we see in the busloads of anticipation that roll up to the casinos every morning and what we hear in the cheers when the dealer goes bust against the whole blackjack table. "It is not just the joy of winning," concluded Goodman, "but winning as part of a team."

The camaraderie of investment clubs is much like the camaraderie of casinos. "I'd just moved to Chicago and was really missing my women friends," said one Beehive investment club member to Woolley (2000). "The club replaced that."

Camaraderie is the rule in casinos even at poker games, where players compete with one another, since the players are united in action. "After a couple of shift changes," writes

Goodman (2000), “players and dealers are on first name basis.” Camaraderie is also the rule in the trading rooms that brings day-traders together. While day traders compete with one another, they also cheer one another and even lend money to one another. But the poker table is not always cheerful and neither is the trading room; tension often brings testiness. The testiness of the day trading room was manifested tragically when Mark Barton killed nine of his fellow day traders one day in 1999.

Casino gambling and stock trading are attractive even when practiced alone. They allow players and traders to find what Csikszentmihalyi (1997) called “flow experiences.” Flow is the experience of a skier going down the slope. “[Y]our full attention is focused on the movements of your body, the position of your skis, the air whistling past your face, and the snow-shrouded trees running by...The run is so perfect that all you want is for it to last forever, to immerse yourself completely in the experience.” (p. 28-29). Flow comes when high challenge meets high skill. This is the experience of an athlete “in the zone,” a slot machine player pulling the lever or a day-trader enthralled by the flickering colors of the monitor.

While high challenge brings flow when skills are high, it brings anxiety when skills are low. Anxiety was what Dr. David Gleitman felt when the stock market plunge obliterated most of his portfolio; he was shivering as he tucked his nine-year old into bed (Simon and Browning (2000).

Portfolio and security design

Risk-averse people can be expected to buy insurance policies while risk-seeking people can be expected to buy lottery tickets. But why would people buy both? Friedman and Savage (1948) answered the question by noting that people buy lottery tickets because they aspire to reach higher social classes while they buy insurance as protection against falls into lower social classes.

Markowitz (1952a) clarified the Friedman-Savage framework by noting that people aspire to move up from their *current* social class. So people with \$10,000 might accept lottery-like odds in the hope of winning \$1 million, while people with \$1 million might accept lottery-like odds in the hope of winning \$100 million. Kahneman and Tversky (1979) extended the work of Friedman and Savage (1948) and Markowitz (1952a) into prospect theory. Prospect theory describes people who accept lottery-like odds when they are below their levels of aspirations but reject such odds when they are above their levels of aspirations. So they accept lottery-like odds by choosing a 75% chance of losing \$1,000 over a sure \$750 loss, but they reject such odds by choosing a sure \$240 gain over a 25% chance of winning \$1,000.

The framework of Friedman-Savage (1948), Markowitz (1952a) and Kahneman and Tversky (1979) is a keystone in Shefrin and Statman's (2000) behavioral portfolio theory. People in behavioral portfolio theory act as if they contain many "doers" each with a different goal and attitude towards risk. People in the simple version of the theory have two doers, a "downside protection" doer whose goal is to avoid poverty and an "upside potential" doer whose goal is a shot at riches.

The prototypical security for the downside protection doer is an equity participation note, such as Merrill Lynch's Market Index Target Term Security (MITTS). Investors who buy MITTS for \$10 are assured of receiving their \$10 in five years even if the Index falls. However, investors receive more, say \$15, if the Index rises 50% by higher at maturity. The 'get at least your money back' floor of an equity participation note satisfies the downside protection goal.

The prototypical security for the upside potential doer is a lottery ticket. The floor of the lottery ticket is zero; buyers are highly likely to lose all their lottery money. But lottery buyers have a chance to reach even multimillion levels of aspiration

Lottery tickets are best for upside potential doers with very high aspiration levels and very little money. This is the case of the man in Chicago who dug so many holes for himself that a lottery ticket provides his only chance to get out. However, upside potential doers with more money and lower aspiration levels can meet their needs through call options and those with even lower aspiration level can buy stocks.

Traders and lottery buyers desire more than downside protection and upside potential and both security designers and lottery designers cater to their desires. Lottery designers can design lotteries with different prize structures, different levels of complexity and different play values. A game with high play value is a game that provides the sense that skill is exercised. Lotteries that allow players to pick their own numbers offer more play value than lotteries where numbers are assigned. Similarly, the wide array of stocks, bonds, options and mutual funds as well as the wide array of securities advice and research tools enhances the play value of securities. Illusion of control (Langer, 1975) leads people to act as if they have control in situations that are, in fact, determined by chance. The illusion of control leads lottery players to believe that their chosen numbers have better odds than random numbers and it leads securities buyers to believe that their chosen securities have better odds than index funds.

Complexity of lottery games is a disadvantage in attracting new players, since learning new games takes time and effort. But complexity is useful in maintaining the interest of players who are bored with old games. Similarly, while the complexity of hedge funds is a disadvantage in attracting investment neophytes, it is an allure to investors bored with mutual funds.

The concept of price in lottery products is not easily defined, much like the concept of the price of a mutual fund or a stock. Expected returns make better sense than prices as measures of value but both lottery players and investors care about prices. For example, Clotfelter and Cook (1989 p. 196) noted that New Hampshire began its lottery in 1964 with tickets selling for \$3, but

dropped the price to 50 cents following New Jersey's introduction of the lottery. Security designers follow similar patterns. For example, ADRs bundle as many foreign shares as necessary to reach a price-per-share that is in line with price-per-share of US companies in the same industry.

The equity premium

Glassman and Hassett (1999) argue that stock prices would soar once people understand that the long-term risk of stocks is no higher than the risk of bonds. On that day the expected return of stocks will be equal to that of bonds and the equity premium will be zero. However, financial economists doubt that the day of zero equity-premium is near. Welch (2000) surveyed 226 academic financial economists and found that they expect an arithmetic equity premium of 7 percent over 10 and 30-year horizons.

The equity premium depends on people's attitudes towards risk as much as it depends on the level of risk. In particular, the equity premium depends on the weight that people place on their upside potential goals relative to the weight they place on their downside protection goals. The equity premium might turn negative if many people place great weight on their upside potential goals. Indeed, preferred securities in such situations are lottery-like.

Lottery-like pyramid schemes were the preferred security in Albania during 1996. As Jarvis (2000) noted, about two thirds of Albanians invested in pyramid schemes and the value of the schemes' liabilities amounted to almost half the country's GDP. Albanians moved their money out of the downside protection accounts into the upside potential accounts as they sold their houses and livestock to invest in the schemes. Tirana of the Fall of 1996, wrote Jarvis, "smelled like a slaughterhouse, as farmers drove their animals to market to invest the proceeds in the pyramid schemes." The collapse of the schemes brought into chaos to Albania. Some 2,000 people were killed in the violence that followed.

Aspirations were the drivers of the Albanian pyramid schemes, drivers made stronger by Albania's decline into desperate poverty following the 1991 transition from Communism. Poverty deepened at the end of 1995 when income from smuggling was eliminated when the United Nations lifted sanctions against Yugoslavia.

The aspiration for upside potential probably blinded many Albanians to the fact that they were buying risky securities with negative risk premia. This is true for many lottery buyers in all countries. Other Albanians, like other lottery buyers, probably understood that they are buying securities with negative risk premia but saw no other hope of reaching their aspiration levels.

Aspiration for upside potential can drive the down the risk premia of rich countries as it drives down the risk premia of poor countries. Imagine a country, such as the US, where swift technological and societal changes make many middle class people feel as poor as Albanians relative to dot-com millionaires. Such people allocate increasing proportions of their portfolios to the upside potential goal and choose lottery-like securities. Their collective action can drive down the risk premium, even making it negative.

Public attitudes and government regulation

The shooting rampage of Mark Barton, the Atlanta day trader, brought much discussion about day trading. "These people are not investors," said Bontempo in an interview with Buckman and Simon (1999). "Calling this investment is totally missing the point... It's a casino, and to be surprised when greedy desperate people lose all their money, and them snap, I mean, who are we kidding? Why should we be surprised by that?" (p C1).

As Bernstein (1996) notes, gambling, in casinos or trading rooms, is usually regarded as a vice while insurance is regarded as a virtue. Gambling behavior raises two concerns: a concern that gamblers might hurt themselves, and a concern that gamblers might hurt society. The first

concern is paternalistic. While debates on the limits of paternalism go on, society has exercised various degrees of paternalism for centuries. A report by Fact Research (Gambling in America 1976) describes the attempts of the Church to limit gambling since its early days.

Gambling was forbidden to early Christians, but an evasion of the code continued for centuries, extending often to the clergy itself. Constantinople, the seat of the Church, was also the 12th Century gambling capital of the world. (p. 5).

The poor are the main targets of paternalistic concerns, perhaps for good reason. The poor spend more than their fair share of money on lottery tickets. Clotfelter and Cook (1989, p.229) reported that Maryland adults with annual incomes under \$10,000 spent an average \$380 on lottery tickets in 1984, and the top 20% of lottery buyers in that group spent an average of \$1,693. Tragedies make it easy to turn paternalistic impulses into regulatory action. For example, the stock market crash of 1929 led to the 1934 Securities Exchange Act and the establishment of the Securities and Exchange Commission (SEC). The Dickenson Report, which formed part of the deliberations leading up to the 1934 Act, said:

It must always be recognized that the average man has an inherent instinct for gambling in some form or other. It has been recognized as a social evil, always inveighed against since early times. No method of combating it has ever been completely successful. (Ellenberger and Mahar 1973).

Less restrictive methods for combating gambling include disclosure of information about its risk. Disclosure was the guiding principle of the Federal 1934 Act, but many states enacted more restrictive “Blue Sky” laws long before 1934. Blue Sky laws prohibit investments that regulators deem too risky. The tragedy of Mark Barton prompted The New York Times (2000) to publish an editorial under the heading Day Traders as Gamblers. It came down on the side of disclosure as a remedy for excessive risk-taking. “[T]he regulators cannot stop foolish customers from gambling their money away.”

Malkiel (1999) distinguishes the risk that day traders take upon themselves from the risk that they impose on markets and the economy. He sees little reason for concern about the latter. “[T]he amount of day trading is small relative to the clout of institutional investors, and it is not credible to argue that this activity poses systemic risks for our markets or our economy.” However, other commentators argued that the behavior of day traders and other risk takers can destabilize markets and the economy. Such commentators are particularly concerned about the effects of leverage and derivatives and they often point to the sad experience of Long Term Capital Management.

Some of the desire to restrain gamblers is rooted in paternalistic concern about the well being of the gamblers themselves while some is rooted in concern about the damage they might inflict on others. But perhaps another part of the desire to restrain gamblers is rooted in the envy of the upstart and the desire of the ruling elite to keep its high relative position in society. Garber (2000) quotes Schama (1987) on the propaganda drive of the Dutch ruling elite to eliminate tulip gambling. “To the humanist oligarchs, the tulip mania had violated all their most sacred tenets: moderation, prudence, discretion, right reason and reciprocity between effort and reward.” (p.36) But paternalism was not the only motivation for the attempts to channel speculative proclivities into the safe areas of economic activity. The safe areas, noted Garber, coincided with those controlled by the ruling elite.

Conclusion

Stock trading, like lottery buying, is a negative-sum game. On average, people lose. So why do people trade stocks and buy lottery tickets? We answer this question by focusing on our common aspirations, thoughts and emotions.

“I’ve dug so many holes for myself over the years that realistically, winning the lottery may be my only ticket out,” says a lottery player living in a poor neighborhood. “We are trying to make some aggressive money very quickly,” says a stock trader who lives in a modest house but has blueprints of a fancy one. Some people who aspire to move up in life can expect to reach their aspiration levels through steady contributions to IRA and 401(k) accounts. But for others stock trading and lottery buying offer the only chance.

Lottery buying and stock trading have great appeal on their own but promoters have learned to magnify that appeal by playing on our thoughts and emotions. Lottery players in advertisements are mostly winners even though most lottery players are losers in real life. Mutual funds in advertisements are mostly winners even though most mutual funds lag index funds in real life.

More than a half-century ago, Friedman and Savage (1948) described people as they are, people who hope that a lottery ticket will lift them into a higher social class while they trust that an insurance contract will protect them from falling into a lower social class. Friedman and Savage assigned equal roles to lottery tickets and insurance contracts in their lottery-insurance framework. Shortly afterwards Markowitz took us to a fork in the road (1952a, 1952b). In one, Markowitz extended Friedman and Savage’s framework, assigning to lotteries a role as big as the role of insurance. In the other, the mean-variance framework, Markowitz (1952b) assigned to lotteries no role at all.

Markowitz offered the mean-variance framework as a *prescription* for wise investment behavior, not as a *description* of actual investment behavior. As Markowitz (2000) wrote “[T]he fiduciary should not gamble, that is, the fiduciary who is responsible for serious amounts of other people’s money (e.g. retirement money) should not incur risk without demanding reward.” But Markowitz (2000) also noted that the Friedman-Savage framework describes

actual investment behavior. “On the other hand, individuals do buy lottery tickets ... and do buy insurance against the major losses ... This can be explained within the expected utility framework by placing everyone at or near an inflection point in the Friedman-Savage framework.”

Markowitz’s prescription mean-variance framework turned into a descriptive framework on its way from 1952 to our time. Today’s final theory is built on the premise that investors *are* always risk-averse. So why do investors trade stocks and buy lottery tickets?

It is time to return the mean-variance framework to its role as a prescriptive framework and adopt the lottery-insurance framework as the descriptive framework. Some have done so. Markowitz built on the lottery-insurance framework, and so did Kahneman and Tversky (1979) in their prospect theory and Shefrin and Statman (2000) in their behavioral portfolio theory. But more is needed.

Perhaps it is also time to question the role of the mean-variance framework as a prescriptive framework. Yes, the fiduciary who is responsible for other people’s money should not gamble. But how much insurance is enough? Fiduciaries can be unwise by being too risk-averse, not only by being risk-seeking. Moreover, is it really unwise to engage in some risk-seeking behavior? “After buying a lottery ticket,” writes Pope (1983), people “can dream from age nineteen to ninety-nine that they will become millionaires after the next drawing.” Is it wise to extinguish dreams that sell for a dollar?

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