Memo to: Oaktree Clients

From: Howard Marks

Re: You Bet!

As I've written in past memos, I have an indelible recollection of the first book I read as a Wharton freshman in 1963. The book was *Decisions Under Uncertainty: Drilling Decisions by Oil and Gas Operators* by C. Jackson Grayson, Jr. (who in 1971 would take on the role of "price czar" in the Nixon administration's efforts to get inflation under control).

The best and most lasting thing I took away from Grayson's book – and the first thing I remember learning in college – was the observation that **you can't tell the quality of a decision from the outcome.** This revelation had a profound influence on me as a 17-year-old and represented the first critical building block in my understanding of how the world works.

As Grayson explained, you make the best decision you can based on what you know, but the success of your decision will be heavily influenced by (a) relevant information you may lack and (b) luck or randomness. **Because of these two factors, well-thought-out decisions may fail, and poor decisions may succeed. While it might seem counterintuitive, the best decision-maker isn't necessarily the person with the most successes, but rather the one with the best process and judgment. The two can be far from the same, and especially over a small number of trials, it can be impossible to know who's who.**

By my stage in life – if not well before – one should have figured out his strengths and weaknesses and tilted his activities toward the former. I've concluded that my strengths include the ability to:

- frame questions,
- logically organize data and weigh pros and cons,
- know what I don't know,
- accept that future outcomes aren't predictable,
- think about the future probabilistically, and
- make decisions incorporating all of the above (although far from always correctly).

Also very important has been the ability to internalize Grayson's point about decision quality (and thus live with my unsuccessful decisions from time to time). This set of attributes equipped me for a career in investing . . . **and for finding enjoyment in games of chance.**

My Life as a Gambler

Although I've made reference to them in some past memos, games have played a bigger part in my life than you probably know. Because of the many connections between investing and gambling, many of the investors I respect play blackjack, poker or backgammon. You might enjoy learning about my past in this regard.

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Like most people my age, I spent time as a child playing card games like "War" and "Old Maid" (there were no videos to watch or video games to play, and my parents considered television a pernicious influence that had to be strictly rationed). My first brush with "grown-up" games and betting involved gin rummy starting around age 12. Hours spent playing with my three closest buddies established a pattern for life.

When I was a sophomore in college (1964-65), card games at the fraternity house took up an embarrassingly large fraction of my time. A different game occupied our afternoons each semester, including gin, pinochle, cribbage, hearts, casino, bid whist, spades and tonk (many of these have since been relegated to the dustbin of leisure-time history). Most evenings were devoted to poker. (You're right to wonder when I studied. I actually can't remember doing much of it that year.) And when I eventually got serious about my studies as an upper-classman, I took up the commensurately serious game of bridge.

The next big step came in 1970-72, when I began to ski and was introduced to backgammon back at the lodge. Although probably dismissed by non-game players as trivial, backgammon, like bridge, is a game that requires a great deal of thought and one where study and practice can lead to a very high level of skill. More on it later.

As you may know, I got Citibank to move me to Los Angeles in 1980. One of the big ways this changed my life was that it led me to meet my great friend Bruce Newberg, whose mind is perfect for handling the odds and strategies involved in games (as it is for investing). Bruce and I have had thousands of hours of enjoyment playing backgammon and gin over the last 40 years. We're probably about even financially after all that time, and if not, the winner's hourly rate of pay is in pennies. **All we get out of it is fun.** Our motto is, "The only thing worse than losing is not playing."

I also enjoy visiting a casino once in a while, and the opportunity to play blackjack. In blackjack, you and the dealer are each dealt two cards. You can "hit" or "stay" as you choose – take additional cards from the deck or decline to do so. The dealer has no choice; he's required to hit (or forced to stay) depending on his card total. In the end, whoever's total is closer to 21 without going over is the winner.

Lots of people go to casinos every year and lose money at blackjack without knowing the first thing about how to play successfully. Instead, they count on luck and hunches and say they "just play to have fun." But there are actions you can learn to take in blackjack – mostly regarding when to hit or stay – that will improve your results. These have been codified into what's called "basic strategy."

Beyond that, the key to further improving your probability of winning lies in the fact that, unlike most games of chance, in blackjack the outcomes of future hands aren't independent of the outcomes of past hands. This is so because in blackjack the dealer deals several hands in succession without returning the cards that have been played to the "shoe" from which he deals. Thus, which cards have already been dealt directly determines which cards remain to be dealt. If you can track the former through "card-counting," you can have an idea about the latter. But since the dealer's shoe can contain six or eight 52-card decks, keeping track of the cards played in itself requires exceptional skill.

Edward Thorp wrote the definitive book on this, called *Beat the Dealer*. When he won too much money, Ed was banned from the casinos and had to turn to "straight" pursuits. As a result, he studied warrants on Japanese stocks and developed the art of arbitrage. When I last saw Ed he was living an idyllic life in Newport Beach, prospering even in the absence of suits, ties or regular office hours.

But let's return to backgammon. In this game, two opponents – one moving clockwise and the other counter-clockwise – try to bring their pieces around the board while simultaneously preventing the other from doing so, and then be the first to take them off the board. Each player's ability to move forward is determined by rolling a pair of dice. It's a total disaster if you're ignorant of the probabilities governing rolls of the dice and instead rely on luck, gut instinct or what you think is your innate skill. (In fact, the most important skill in backgammon consists of knowing these probabilities and thus what actions to take given your position.)

More recently, through study Bruce has gotten too good for me at backgammon, so now we're mostly down to gin. In gin, each player is dealt 10 cards, and by alternatingly picking from the deck and discarding, you try to form them into "melds" of three or four cards of the same kind (such as 9-9-9) or in a run of the same suit (such as 4-5-6-7 of spades). As the hand goes on, you can opt to "knock" (if your un-melded cards add up to less than a certain number) or try to get "gin" (all 10 cards melded), which pays off in more points – unless your opponent knocks or gets gin first.

An aside: when I speak to students, I often say, "For me, the thing that makes investing fascinating is the fact that there's no action you can take that is sure to work, no strategy that's always a winner." To illustrate, I go on: "It's like gin. Sometimes knocking is the best thing to do, and sometimes you should play for gin." And all I get are blank stares. Few young people play cards anymore, and even fewer have ever heard of gin.

Another aside. While I don't think they're the result of conscious decisions, my life as a gambler has always exhibited two characteristics:

- First, I haven't made a serious study of the games I play. I feel if I want to work, I can go to the office.
- And second, I only play for small stakes. Some people dream of big killings, and some like the frisson attached to risking large sums. I've never felt that my enjoyment increased with the amount of money on the table. I play for fun and to test my decision-making, not to win big money. (Point of reference: back around 1990, I was visiting Ric Kayne at Lake Tahoe and he said, "Tonight I'm going to take you to the casino and make a man of you. We're going to play until you win or lose real money!" So he called the casino host and asked him to arrange a $25,000 line of credit for me. The host called back a few minutes later and said, "Sorry, Ric, I can't justify a $25,000 line for someone whose average bet is $11.")

What about coming full circle? One of the best things I ever did was to teach my son Andrew to be a game player at an early age. I now have a built-in opponent for gin and backgammon. There can be few sweeter memories than sitting on a log with him at Big Bear State Park playing War in 1992, when he was five. And it continues; my five-year-old granddaughter, Rosie, is my new opponent at War. There's nothing better!

Thinking in Bets

In a past memo, I told a story from my days as a buy-side analyst following the business equipment industry for First National City Bank. In 1970, one of the bank's portfolio managers asked me whom I considered to be the best brokerage-house analyst on Xerox. "Well," I answered, "the one who most agrees with me is so-and-so."

In other words, we tend to respect people who think like we do. Did you ever hear someone say, "I think Bob's a genius, and he thinks my views are all wrong"? That's something few people would ever say. No, we tend to think highly of people whose opinions mirror ours.

And that brings me to the source of the inspiration for this memo: a book called *Thinking in Bets: Making Smarter Decisions When You Don't Have All the Facts* by Annie Duke. (I provided a blurb for the dust jacket when it was published in 2018.) Duke completed the coursework and dissertation for a Ph.D. in psychology from the University of Pennsylvania but stopped short of receiving her degree, and for many years she was the best-known female professional poker player (with over $4 million of tournament winnings). I was rereading Duke's book while on vacation, and so many of her thoughts on poker and on decision-making in general agreed with mine that I became motivated to start on the memo you're reading now. Here are some excerpts that will show you why I was drawn to it [emphasis added]:

> Over time, those world-class poker players taught me to understand **what a bet really is: a decision about an uncertain future**. . .
>
> Thinking in bets starts with recognizing that **there are exactly two things that determine how our lives turn out: the quality of our decisions and luck**. Learning to recognize the difference between the two is what thinking in bets is all about. . . .
>
> The result of each hand provides immediate feedback on how your decisions are faring. But it's a tricky kind of feedback because **winning and losing are only loose signals of decision quality**. You can win lucky hands and lose unlucky ones. . . .
>
> **What makes a decision great is not that it has a great outcome.** A great decision is the result of a good process, and that process must include an attempt to accurately represent our own state of knowledge. That state of knowledge, in turn, is some variation of "I'm not sure." . . .
>
> . . . we must recognize that no strategy can turn us into perfectly rational actors. In addition, we can make the best possible decisions and still not get the result we want. **Improving decision quality is about *increasing* our chances of good outcomes, not *guaranteeing* them**. . . .
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> We are discouraged [in life] from saying "I don't know" or "I'm not sure." We regard these expressions as vague, unhelpful and even evasive. But getting comfortable with "I'm not sure" is a vital step in being a better decision-maker. **We have to make peace with *not knowing*. . . .**

> **What good poker players and good decision-makers have in common is their comfort with the world being an uncertain and unpredictable place. They understand that they can almost never know exactly how something will turn out. They embrace that uncertainty and, instead of focusing on being sure, they try to figure out how *unsure* they are, making their best guess at the chances that different outcomes will occur. . . .**
>
> An expert in any field will have an advantage over a rookie. But neither the veteran nor the rookie can be sure what the next flip will look like. **The veteran will just have a better guess**. . . .

You don't have to read far in *Thinking in Bets* before it becomes clear that Annie Duke shares Jack Grayson's interest in decision-making under uncertainty. Duke looked for real-world applications at the poker table, and Grayson in the oil patch. **But both worked on how to make decisions when faced with imperfect information and uncertain outcomes. That brings me to the subject of investing . . . and this memo.**

Parsing the World of Gambling

People who aren't very familiar with games or who don't dwell on them probably think they're all variations on the same theme. But actually there are big differences. I want to touch on them so I can go on to create an effective analogy between gaming/gambling and investing. Importantly, games vary in three primary dimensions: information availability, luck and skill.

Some games (but not all) require players to deal with uncertainty. Whether you or your opponent will win – or what action you should take – might hinge on information that's not available to you, and about which you can make inferences or guesses at best. **Thus in some games, there's important "hidden information,"** and in others there isn't. In poker, blackjack and gin you don't know what cards your opponent is holding. But in chess and backgammon, everything's plain to see: the position of the playing pieces on the board. Nothing is hidden. Obviously this is a big difference. Where no information is hidden, the game is reduced to the other two elements.

After the conditions have been set (the cards have been dealt or the pieces are in their positions on the board), there's another source of uncertainty. **In some games subsequent developments will be influenced by luck**, and in some they won't. Take the two games I said don't involve hidden information: chess and backgammon. In chess, there's no such thing as luck – no dice to throw or cards to draw; the key variable is the moves your opponent chooses to make. (I guess there is one element of luck: how skillful is the opponent you've drawn?)

In backgammon, on the other hand, the moves a player gets to make are entirely determined by what numbers come up when he rolls the dice. And in card games, what cards he and his opponent draw is subject to luck. Sometimes these things are total unknowns – a matter of sheer randomness – and in others, while the outcome can't be predicted with certainty, probabilities can be assigned.

- In blackjack, for example, we can know something about the cards that will come out in the future if we can keep track of the ones that already have been played.

- And in backgammon, we know with absolute certainty the probability of every possible result of rolling the dice: over a large number of rolls, the number seven will come up 16.7% of the time (six of the 36 possible outcomes on a roll of the dice), and the number twelve will come up only 2.8% of the time (one out of the 36). Of course, even if we know the probabilities, we still don't know which number will come up on any one roll.

Finally, in some games skill is important, and in others it isn't. There's skill (albeit with varying degrees of difficulty) in all the games I've discussed so far: chess, backgammon, poker and gin. Games with and without hidden information can entail skill, and games affected and unaffected by luck can entail skill.

But the role of skill isn't universal in games/gambling. Roulette and wheel-of-fortune are games of pure chance or luck. The outcome is entirely a matter of random events that can't be predicted at all, like which slot in a roulette wheel the ball will fall into when the wheel stops spinning. And since there's no ability to predict future developments, there's no such thing as skill: only luck.

- In the early 1980s, I used to go to Las Vegas with a now-departed friend. He spent a lot of time (and money) on wheel-of-fortune, which is nothing but vertical roulette. I used to tell him he was "the world's greatest wheel-of-fortune player." Since he thought there actually was such a thing as playing the game well, he never got the joke.
- There's a very interesting example in *punto banco*, a form of baccarat. As Wikipedia says, "In *punto banco*, each player's moves are forced by the cards the player is dealt." That is, there are no decisions to make, so clearly no such thing as skill in decision-making. You sit down, place your bet, receive your cards, and either win or lose. One version of history says baccarat was invented for the enjoyment of a king who wasn't smart enough to learn to play games; thus one was developed that required no decisions . . . and thus entailed no skill.

Note from the above the different types of games:

- No hidden information, no luck, skill. (Chess)
- No hidden information, luck, skill. (Backgammon)
- No hidden information, luck, no skill. (Roulette)
- Hidden information, luck, skill. (Blackjack, poker)

Now we can drill down. Here are some important observations:

- Where there's no skill involved, the outcome has to depend entirely on luck.
- But even if skill is involved, luck can still play a role.
- The presence of luck doesn't necessarily preclude a role for skill. **In fact, making intelligent decisions when future events are uncertain is one of the greatest forms of skill.** It's what Grayson's and Duke's books are all about.
- **Likewise, the ability to deal intelligently with hidden information has to be based on skill.**

Creating this taxonomy, or "scheme of classification," not only allows me a chance to educate non-game-players, but it also provides a framework for a comparison to investing (if you hadn't noticed).

How Is Investing Like Gambling?

Hidden information, luck and skill can play a part in investing. In active investing involving public companies, for example, all three are involved.

- Clearly, no one knows all the relevant facts. The SEC tries to make sure all investors have **equal access** to information, but not necessarily **complete access**. For example, investors won't know about first-quarter developments at a company until it reports earnings in May. And no one is supposed to know the results of drug trials and beta tests until they're made public.
- Luck – random, unpredictable, often-exogenous events – affects companies and their stocks all the time. Many aspects of corporate performance and profitability can be influenced by weather, for example. And the TV network carrying the World Series is likely to enjoy much greater ad revenue if the teams playing come from major markets rather than small ones.
- Finally, the superior investor has the skill required to better assess revenue and profit potential, where we stand in the cycle, the fairness of an asset's price and the margin of safety it affords. No one gets these things right all the time, but the superior investor does so more often than most.

Not all investing, however, entails all – or necessarily any – of the three elements. Take, for example, index investing. The index fund manager's job is to produce the same return as the relevant index.

- There's no such thing as hidden information. The only information the investor needs to succeed at his job relates to the composition of the index in question, and there's no mystery in that regard.
- Likewise, there's no luck. The forces that influence the securities in the index will have exactly the same influence on a properly constructed index fund.
- And finally, there's no skill. All it takes is a well-programmed computer to keep the fund's portfolio in line with the index, and that isn't hard to find.

It's worth delving into the matter of investing skill. The efficient market hypothesis posits that (a) markets are "efficient," (b) thus assets are priced fairly and there are no bargains or overpriced assets, and (c) as a result, there's no scope for skill or "alpha," defined as the ability to outperform by capitalizing on mispricings. The traditional view of active investing, which ignores this hypothesis, is that investing is like blackjack, meaning it's possible for some people to be better at it than others. But if the efficient market hypothesis is right, investing is like roulette, with investors' returns beyond their control and solely a function of luck, or what the market does. (Of course, a portfolio's return can be amplified or diminished relative to the market's return by the portfolio's relative sensitivity to it: the "beta." And that leads to the question of whether investors have the skill to move beta up and down in a timely fashion.)

In most markets, the concept of efficiency is neither an absolute truth nor completely inapplicable. **Some markets may be less efficient than others; thus skill may be more relevant in some markets than in others.** Where skill is highly relevant, markets are called "alpha" markets. Where

it's not – and the portfolio return is mostly a function of the market's return and the portfolio's sensitivity to market movements – they're called "beta" markets. Obviously it's important to figure out which type of market you're working in.

For years, people (whether consciously or not) treated the stock market as an "alpha" market, and equity portfolio managers were able to charge substantial management fees for their efforts. But over time, it was increasingly observed that most active investors were incapable of consistently outperforming the market indices (especially after fees). That meant skill was lacking: you could get the same result or better by passively emulating an index. Investors concluded that they would no longer pay for alpha in a beta market, and that's the main reason for the growth of passive investing. **Why pay someone to play for you in a game where there's no such thing as skill?**

What's the bottom line? **In my view, the active investing I'm interested in – hopefully in markets that are less efficient – involves all three of the ingredients under discussion: hidden information, luck and skill. Thus it's most like poker and blackjack, not chess.** It's in that vein that I'll proceed.

The Essence

One of the most important aspects of skill in gambling consists of figuring out which possible outcome to bet on, and when to bet heavily and when not to. This is where all facets of the decision come together.

Gauging the likely outcome – How likely is one participant (you?) to win, and how likely is someone else? Whether in card games, backgammon or sports betting, there are a number of factors to consider. The most important are these:

- How good is your current position?
- How many paths do you have to winning (and to losing)?
- To what extent would it require good luck regarding throws of the dice or draws of the cards for you to win? And what's the probability your opponent will enjoy good-enough outcomes for him to be the winner instead?

The job here is to "handicap" the outcome, defined by Merriam-Webster as "to assess the relative winning chances of (contestants) or the likely winner of (a contest)." Which poker player has the best hand? Who's in the better position on the backgammon board? Or for the bettor, which horse is likely to win the race, or which team is likely to win the game? **To put it simply, who's the favorite?**

Many people think figuring out who's most likely to win is all you have to do to successfully bet on card games, backgammon or sports. They're missing a huge part of the matter, and perhaps the far more important part.

Assessing the proposition – There's usually not much mystery involved in identifying the favorite. It's pretty clear who's ahead in backgammon. It's more of a challenge in card games, where players hold cards the others don't know about, but still it's possible to have a sense for how good one's

hand is in absolute terms. And in most cases there's a solid consensus around which horse or team is most likely to win.

But one of the most important things to know about gambling is that information that's available to everyone isn't likely to produce winnings. Since most people know who the likely winner is in a hand of cards, a backgammon game that's underway or a sports bet, that isn't valuable information. **Everyone might like to bet on a favorite, but that means it's unlikely they'll be able to find someone to take the other side of the wager: to bet against the favorite without an inducement.**

That inducement takes the form of a "proposition." Consider a football matchup in which Team A is considered twice as likely to win as Team B. Stated another way, Team A is viewed as likely to win two times out of three, and Team B only once. If it's common knowledge that Team A is that much better, no one will bet on Team B unless the person who favors Team A is willing to "lay odds." That is, Joe might tell Ed, "I'll give you 2-to-1 odds; I'll bet $10 against your $5 that Team A will beat Team B." Assuming the outcomes go according to expectations, Joe wins $5 two times out of three and loses $10 one time. Over three games, then, the two bettors come out even. That means 2-to-1 odds are "fair" in this situation.

So here's the bottom line: the goal isn't to figure out who the favorite is and bet on it. Rather, the goal is to figure out who the favorite is **and whether the odds are fair or not**.

- If the odds are fair, as illustrated above, there's no reason (other than sentiment) to bet on one team or the other.
- If the odds don't penalize the favorite enough – let's say the odds on the above matchup are only 6-to-5 – you should bet on the favorite. Team A will win two-thirds of the time. The one time out of three when they lose, the $6 you pay won't offset the total of $10 you win on the two occasions when they come out ahead.
- But if the odds are tilted against the favorite – the odds are "too long," maybe 4-to-1 – it's better to bet on the underdog. You'll still lose $1 two times out of three (for a total of $2), but on the one game you win, the $4 payoff will more than compensate.

A great example can be seen in the world of backgammon. The player who's ahead can offer to double the stakes from $5 to $10 by "turning the cube," in which case the other player has to choose between surrendering for $5 or playing on for $10. Since the leader offers to double because he's ahead, does that mean it's a mistake for the player who's behind to accept? Not necessarily.

- Clearly, if the laggard surrenders, he loses $5.
- But what if, let's say, he has a 25% chance of winning and plays on for $10? In that case, his expected outcome is ($10 loss x .75) + ($10 gain x .25), which works out to the same $5 loss.

The lesson from the above is that a player who is behind should accept a double whenever his chance of winning exceeds 25%, which would give him an expected loss that's less bad than surrendering for $5. **Sometimes it's a good idea to bet on an inferior position . . . even though doing so is expected to result in a loss most of the time. It all depends on the proposition.**

My friends Matt Bensen and Corey Robinson provided an apt excerpt from a speech titled "The Art of Stock Picking" by Charlie Munger. In it, Charlie compares investing with the pari-mutuel betting system at the racetrack, where the payoff for each horse winning is determined by how many people bet on it:

> If you stop to think about it, a pari-mutuel system is a market. Everybody goes there and bets and the odds change based on what's bet. . . . Any damn fool can see the horse carrying a light weight with a wonderful win rate and a good post position etc., etc. is way more likely to win than a horse with a terrible record and extra weight and so on and so on. But if you look at the odds, the bad horse pays 100 to 1, whereas the good horse pays 3 to 2. Then it's not clear which is statistically the best bet . . .

Success in gambling doesn't go to those who pick winners, but to those with the ability to identify superior propositions. The goal is to find situations where the odds are generous to one side or the other, whether favorite or underdog. In other words, a mispricing.

It's exactly the same in investing. People often say to me, "XYZ is a great company with a bright future, so I bought the stock." They're picking a favorite but ignoring the proposition. The former alone isn't enough; they should consider the latter as well.

Likewise, one might say that even the best venture capitalists are poor at picking winners, since a lot of their investments result in losses. But the payoff on the ones that succeed is so large, it's sufficient to pay for the losers many times over and make the overall effort a great success.

While in investing we generally aren't offered explicit odds, the attractiveness of the proposition is established by the price of the asset, the ratio of the potential payoff to the amount risked, and what we perceive to be the chance of winning versus losing.

Superior investors may be superior because they can figure out which companies are likely to be winners. **But the best investors I know also have a sense – perhaps innate and instinctive – for situations where the proposition is too favorable relative to the underlying fundamentals.** It might be a company whose securities are cheap enough to more than compensate for its poor prospects, or one where the future is exceptionally bright, but its securities aren't priced high enough to charge fully for that potential.

In May 1968, when I showed up at First National City Bank for a summer job in the investment research department, the bank (and many other banks) invested primarily in the "Nifty Fifty." These were considered to be the best and fastest-growing companies in America: companies so good that there was "no price too high." And if you bought those stocks the day I arrived and held them firmly for five years, **you lost almost all of your money . . . investing in the best companies in America.** All the companies were considered future winners. Some actually were, but far from all. (What happened to Kodak, Polaroid and my favorite, Simplicity Pattern?) The proposition was wrong: they were priced as if they couldn't lose, and it turned out several would.

Then, in 1978, I switched to Citi's bond department, and I was asked to start a high yield bond fund. Now I was investing in **the bonds of the worst public companies in America** – all rated speculative grade, or "junk." And I was making good money safely and steadily. Not because the companies

were flawless – in fact, about 4% by dollar amount would go on to default each year on average – but because "the price" was too favorable to those who bet on them.

This experience produced two of my most important observations:

- **Success in investing doesn't come from buying good things, but from buying things well, and it's essential to know the difference.**
- **It's not a matter of what you buy, but what you pay for it.**

Nifty Fifty investors spent all of their time picking favorites and failed to notice that the prices they paid were too high. **Mostly winning companies, but poor investments.**

And because popular opinion was stacked so heavily against high yield bonds, those who invested in them received excessive compensation for taking the associated risk: **the proposition was too good**. Moody's defined a B-rated bond as one that "fails to possess the characteristics of a desirable investment." In other words, Moody's panned those bonds because they were underdogs but never asked about the price. It's usually non-objective, too-positive or too-negative attitudes like these that give rise to propositions that are too good or too bad for the takers. That's what we should search for as investors.

Guest Contributor

As I mentioned on page three, one of the best things I ever did was to encourage my son Andrew to develop a love of games. In Andrew's case, he applied the same seriousness to games that he does to investing and his other pursuits. This gave him the thought process of a gambler and enables him to suggest the following ways in which gambling has parallels to investing:

- **Game selection versus skill** – When considering where to invest, it's important to understand both how much of the requisite skill you possess and the quality of the competition. Being a consistent winner among the best gamblers or in the most intensely competitive markets can be very difficult. Instead, your energy might be better spent looking for less-efficient niches. Unfortunately, it's harder to find them than it was decades ago.
- **Increasing efficiency/the tendency of markets to adapt** – In the early days of online poker, it was easy for decent players to win, and a lot of amateurs were enticed to play by seeing a newcomer win the World Series of Poker. After some time, however, the games became tougher as they attracted professional players, and the amateurs lost their money. The new, more sophisticated generation of competitors learned their predecessors' tendencies, improved on their strategies and started beating them. In this way, changes in the arena and in participants' behavior can cause what worked years ago to not work today.
- **Circle of competence** – Just because you're great at gin rummy doesn't mean you should play Texas Hold'em against a professional poker player. It's important to know your strengths and stick to them.
- **Not having to play every hand** – There's no requirement to bet on every game or every hand. You can wait until you get a particularly attractive proposition, one that you feel particularly capable of analyzing and understanding, and where the odds are on your side. In the interim, it's better to sit out and protect your bankroll.

- **The importance of not just winning and losing, but of maximizing wins and minimizing losses** – The key is to bet big when you have a big edge and small when you have less of an edge . . . and to know the difference. As Charlie Munger puts it, "The wise ones bet heavily when the world offers them that opportunity. They bet big when they have the odds. And the rest of the time, they don't. It's just that simple." Everyone will have both winners and losers. Various factors will determine the ratio. But the ability to assess propositions can enable you to win more on your winners than you lose on your losers. The size of your bet should take into account both the probability you are correct about who's going to win and the asymmetry of the potential payout. "Getting your money in" when you have a great hand is one of the most important keys to winning at poker. You don't get many great hands, so when you do, you have to be sure to take maximum advantage.
- **Being able to make it through downturns** – It's important to have discipline when risking your capital, so that you can survive unfavorable periods and still be around when the winners show up. You have to avoid the risk of ruin, and this requires solid discipline (you must "never forget the six-foot-tall man who drowned crossing the river that was five feet deep on average"). To that end, good play isn't just a function of relying on the expected value of your holdings and pure math, but also of thinking broadly about risk. Would you bet all your money on an 80/20 favorite?
- **Adjusting your play based on the environment** – In poker, if your competition is weak, you may decide to play more hands regardless of their strength and bet more aggressively, while against strong players you may tighten up and only play premium hands.
- **Overcoming emotion and biases** – Human failings can cause gamblers to "chase" in poker (overstay in a hand in the hope of getting a lucky card), play loose (bet too much) when they're "steaming" (smarting from losses and thus driven by heated emotion), and take bad doubles in backgammon. Hope, emotion and optimism are the gambler's enemies.
- **Second-level thinking** – It's not just how good your hand is. There's much more. How good does your opponent think your hand is? How good do you think your opponent's hand is? How good does he think you think his is? How is that motivating his actions? The consistent winner has to be able to think at a higher, more complex level than the rest.

All the ideas discussed above are important in investing, just as they are in gambling. In both pursuits, it all comes down to Jack Grayson's title: *Decisions Under Uncertainty*. As I've learned in the 56 years since first reading his book:

- You have to be able to understand which companies or assets are favored and the attractiveness of the proposition.
- You need a sense for whether your holding is a good one and for the chance the competition – the market, which you're playing against – might have better.
- You need the discipline to follow a process and the wisdom to accept that no process is sure to produce good results.
- You have to understand the significance of the information you have, as well as that which you don't have. You need the nerve to bet heavily based on what you think you know and a healthy respect for what you may not know.
- You need to control greed and fear, hopefulness and despondency. You have to resist making an unwise bet just because it could enable you to catch up with the indices or the competition.

Since her book provided the impetus for this memo, I'll let Annie Duke sum up. She'll be talking about poker, but it'll sound a lot like investing [emphasis added]:

> When we think probabilistically, we are less likely to use adverse results alone as proof that we made a decision error, because we recognize the possibility that the decision might have been good but luck and/or incomplete information (and a sample size of one) intervened.
>
> Maybe we made the best decisions from a set of unappealing choices, none of which were likely to turn out well.
>
> Maybe we committed our resources on a long shot because the payout more than compensated for the risk, but the long shot didn't come in this time.
>
> Maybe we made the best choice based on the available information, but decisive information was hidden and we could not have known about it.
>
> Maybe we chose a path with very high likelihood of success and got unlucky. . . .
>
> But it also means we must redefine "right." **If we aren't wrong just because things didn't work out, then we aren't right just because things turned out well**. . . .
>
> First the world is a pretty random place. The influence of luck makes it impossible to predict exactly how things will turn out, and all the hidden information makes it even worse. If we don't change our mindset, we're going to have to deal with being wrong a lot. . . .
>
> Poker teaches that lesson. A great poker player who has a good sized advantage over the other players at the table, making significantly better strategic decisions, will still be losing over 40% of the time at the end of eight hours of play. **That's a whole lot of wrong. And it's not just confined to poker**. . . .
>
> How can we be sure that we are choosing the alternative that is best for us? What if another alternative would bring us more happiness, satisfaction, or money? The answer, of course, is we can't be sure. Things outside our control (luck) can influence the result. **The futures we imagine are merely *possible.* They haven't happened yet.** We can only make our best guess, given what we know and don't know, at what the future will look like. . . . When we decide, we are betting whatever we value . . . on one of a set of possible and uncertain futures. **That is where the risk is.**

Investing is a game of skill – meaning inferior players can't expect to be above average winners in the long run. But it also includes elements of chance – meaning skill won't win out every time. In the long run, superior skill will overcome the impact of bad luck. But in the short run, luck can overwhelm skill, and the two can be indistinguishable.

These are the things that make investing both challenging and stimulating. They're the reason I feel good about the way I chose to spend my career.

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