

BARRON'S

Q&A

The Stockpicker's Burden, and Other Lessons

By Leslie P. Norton and Dan Lam March 19, 2018 8:00 am ET



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In 1962, the young writer Tom Wolfe wrote a sympathetic profile in the *Washington Post* about a 30-year-old mathematician who had learned how to beat the house in blackjack. The mathematician, Edward Thorp, described how to figure out the sequence of the cards and how to bet accordingly.

The story went viral. And Thorp, who taught math at the Massachusetts Institute of Technology and then at the University of California, Los Angeles, became an instant celebrity who wrote best-selling books about his techniques. (In fact, Fischer Black and Myron Scholes used a key idea from one of those books for their formula to price options; Scholes, along with Robert Merton won the Nobel Prize.)

Thorp also invented a wearable computer that could beat the casino at roulette. Soon, he took what he knew and began applying it to the stock market and taking private clients. One early admirer was Warren Buffett, who having briefly shut down an early money management vehicle because stocks were too expensive, advised a client to sign on with Thorp. In 1969, Thorp opened Princeton Newport, a quant fund that returned 19.1% a year until 1988. A few years later, Thorp started a new statistical arbitrage fund using techniques he discovered in 1980.

"Ed is known as the father of quantitative investing, but his genius has really been the ability to identify inefficient areas of the market and figure out ways to take advantage of mispricings," said Steven Friedman, founder of the Santangel's Investor Forum, an investor conference. Thorp shut the second fund down in 2002, when returns "were down to the low teens. I didn't want to work for the low teens," he recalled.

All along, Thorp has been writing his books, including the entertaining and informative memoir *A Man for All Markets*, which comes out in paperback next month. We caught up with Thorp, now 85, just before he left for a hiking vacation in New Zealand. In this first part of the wide-ranging interview, he told us how stock markets are like casinos, and why index investing is worth it. Keep reading for more.

Barron's: How did you become the father of card counting?

Thorp: In high school, it occurred to me that the roulette ball moves in a stately orbit like a planet. I thought it might be predictable. I did a lot of doctoral work in physics, and was convinced I could predict from the motion of the ball and the spinning rotor roughly where the ball would fall, and if I did so I would have a huge advantage. That's what got me interested in gambling. I went to the casinos in Christmas of 1958, and while there I read an article from a statistics journal that showed how to play blackjack so you lost slowly. I decided the game was beatable essentially by keeping track of the cards. So I got all the information from the people who wrote the article, improved their calculations, and used those calculations to figure out how to count cards.

I was at M.I.T. at the time and [entered the data into] an early high-speed computer that was available to the faculty. After nine months, I had my results. I saw that indeed you could beat blackjack and do a nice job. I announced it at the American Math Society, which was attended not just by mathematicians but lots of other characters like Tom Wolfe, and then it went viral on the Associated Press wire.

Q: Why are some tables hot and cold?

A: If the game is honest, most of the time it's just random fluctuations. Those random fluctuations are what I think of as luck.

BIO

Q: How are casinos similar to the stock market?

A: Imagine you are investing in an index fund. The casino is Mr. Market, who offers you a collection



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of bets. If you choose an index fund, say VTSAX [the Vanguard Total Stock Market Index fund], on a typical day it randomly fluctuates by 1%. But there is a long-term drift in your favor of about one twentieth of a [percentage point]. So if you had \$1 million in your portfolio in such an index, Mr. Market will come to you each day and say, "Let's flip a coin. If it's 50/50, then you'll win \$10,000 or lose \$10,000. But I'll pay you \$500 if you play that day." If you play for one day, you'll be at \$9,500 or at \$10,500. If you play for a year, the chances are moderately good that you'll be ahead because those \$500 payments add up and overcome the fluctuation. Maybe a third of the years, you'll be down and unhappy. But if you play for 10 years or 20 years, then those \$500 payments just keep adding up.

Warren Buffett has also devoted his life to compounding. So a similar process happens at blackjack tables. If you're counting cards, you

have a little drift in your favor. But in blackjack you play 100 hands an hour, and in a week you may play 4,000 hands. In a casino, you get to the long run fairly quickly.

Q: That stock market drift you're talking about—are those the real numbers?

A: It is five basis points a day. [A basis point is one-hundredth of a percentage point.] Multiply that by 250 days, and it's about 12.5%. The historical geometric growth is about 10.5%, because of the fluctuations.

Q: Given that drift, is stock-picking even worth it?

A: There are three types [of investors]. One wants to do well and not spend a lot of time. Those should be passive investors, and they will beat most of the others who will be dragged down by fees and costs and punished by what I

call "the scared-rabbit syndrome," which is that they run out at the bottom and get back in at the top. The index investors who just buy and sit avoid all these issues.

Then there is the small group of investors who want to be professionals—hedge fund managers, people who work for endowments, universities, and so on. I might add that they haven't done all that well. Then there are people who just enjoy messing around in the market and are willing to spend time to get an education. For them, I say, take a small amount of capital and learn. But put most of it in an index fund where it will grow while you are busy getting your education and paying for it.

I paid for my education and know it can be fairly expensive. My book talks about some big mistakes and also about the Kelly Criterion formula, which tells you how to allocate money between risky alternatives and gives you an idea of how much to allocate to each.

Q: But before applying the Kelly Criterion, as you've pointed out, you need to know how big your edge is. How do you do that?

A: At a casino, you can generally calculate your edge fairly precisely. In the stock market, it's not so easy. For an index fund, the statistical numbers we've viewed are probably not too far off what you can expect going into the future, assuming the world stays something like the world we know and the U.S. is the successful country it is. It doesn't have to be the only superpower. The historical experience in first-world countries goes back for centuries. So we have a pretty good idea what the statistics are going to be for equities going forward.

Then take those numbers and shade them somewhat conservatively, using [your assumption of] rates and tail risk. Then you can do a pretty good conservative calculation of how much to invest. But really, don't borrow. You can make much more if you borrow when things are reasonably good, but every so often, something nasty happens.

Look at all those people who were in the VelocityShares VIX Short Volatility Holding exchange-traded note. For years people minted money and kept telling me how great it was. I studied it, couldn't see their edge, and I could see the black swan downside. Sure enough, it was wiped out last month.

Read part 2 of our interview with Edward Thorp, "Why Edward Thorp Only Owns Berkshire Hathaway"

Comments? E-mail us at editors@barrons.com

BARRON'S

Q&A

Why Edward Thorp Owns Only Berkshire Hathaway

By Leslie P. Norton and Dan Lam March 20, 2018 8:00 am ET



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This is part 2 of our interview with Edward Thorp. For part 1, [click here](#).

In the second part of our interview with card counter and mathematician Edward Thorp—the father of quantitative investing—he recalled an early brush with Bernie Madoff, described what's in his portfolio, shared his solution to gun violence, and served up the secrets of a long life. He also shared his most recent list of what he does to promote healthy longevity, which we post in its lightly edited entirety below.

Barrons.com: All the way back in 1991, you were suspicious about Bernie Madoff's returns.

Edward Thorp: I was asked to review the portfolio for a client, the pension plan of a large international consulting firm. I looked through their various managers. All looked fine except Bernard Madoff Investment Securities. [The returns were exceedingly regular](#)—1% or 2% a month no matter what was going on in the market, using an allegedly simple strategy of an options collar. Even when the market went down, they had magically guessed they should put on a large short in S&P index futures. It couldn't be right. I asked the client for confirmations. For half of them, the trades never took place on

the exchange that the tickets said they traded on. Then for another quarter of them, the volume didn't match the exchange volume.

I called a friend at Bear Stearns and asked him, as a special favor since I was a large client, to get information on trading on 10 particular options on certain days. The 10 options they checked for me showed no evidence they were connected in any way with Madoff. So I told my client this was an absolute fraud and he needed to pull out. Of course, it didn't blow up for 17 years. Some people were enraged that I never told them, but I had a fiduciary obligation to keep my mouth shut.

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Q: What's in your portfolio now?

A: One good stroke of good fortune was meeting Warren Buffett in 1968. It led me to realize that I needed to invest in [Berkshire Hathaway](#) (ticker: BRK.A), although I didn't do it until 1982. It's my single investment in the stock market. It's like a broad value-stocks equity index. I hold it in lieu of VTSAX [the [Vanguard Total Stock Market](#) fund]. It does about as well with no current taxes to pay. VTSAX has dividends that are taxed annually. I also have some hedge funds, but I consider them not as good as Berkshire, so I use them to spend and finance other things I do.

Q: Why not go out and find better investments, as you did in the past?

A: When I was 35, I had lots of time and less money, so doing 10% or so better than the index, with little risk, was attractive and fun. At 85, the marginal value of time is higher

and the marginal value of money is lower. These are strong disincentives when I can make a long-run 10% or so by doing nothing.

Q: There are a lot of quant funds in the market today. Is there so much competition that the inefficiencies, which at one time you would have exploited, are gone?

A: I don't think so. The quant funds trawl through massive amounts of data. But there's a lot of information about companies that aren't in the available data, including strategic thinking. Take, for instance, the fact that some companies buy back stock intelligently and some do it very stupidly. The intelligent ones buy back stock when they're getting their money's worth, when it's actually worth paying for the shares because they're underpriced. Take an extreme case where the stock has liquidation value of \$10 a share and the company can buy back stock at \$8 a share. Many closed-end funds are in exactly the situation I just described. They just don't happen to buy back their stock because they don't want to reduce the amount of capital they manage and [thus] reduce their fees. There are a lot of things that involve thinking that artificial intelligence isn't going to find.

Q: What do you think of stocks?

A: Stocks today are on the high side and will be hurt as rates rise. We are probably late in this cycle. We're due for a slowdown and maybe another severe correction. If you're a long-term investor, though, equities are the way to go.

Q: What lessons do you want people to come away with from A Man for All Markets?

A: That the best thing you can do for yourself is to educate yourself to think clearly and rationally. It helps to have math or science or logical training. The next is to be widely read and curious. If you are that way, you have so much more to use in terms of tools. [Berkshire Hathaway Vice Chairman] Charlie Munger has a collection of multiple mental models—shorthand ways to think of things. I also have my own, and one of my favorites is to understand externalities [spillover effects from other economic activity].

For example, if I buy fire insurance for my house, my neighbor is a little safer. That's an externality benefit. If someone drives a polluting gasoline car and uses the atmosphere as a waste dump without paying any consequences, that's a negative externality. Another one is guns. Gun dealers make a lot of money, their clients go out and kill people, and society pays huge costs. Gun dealers don't.

Externalities are a good way to start analyzing problems. A lot of problems go away if you make people who distribute negative externalities pay the consequences. There's a neat solution. Automobiles kill about 35,000 people

a year. If you want to drive a car, you need a license, some training, and also insurance if your car does damage. People have to be accountable for their guns, just like cars. If your car is stolen, you are expected to report it. [What if it were the] same with guns? People wouldn't be able to accumulate thousands of guns, because what insurance company will insure it? What do you think the insurance would be for an AR-15? It would be very high.

Q: You're 85 and look like you're in your early 60s. What's your secret?

A: I think rationally and clearly about how to slow aging. I've been exercising since my 20s. I started running marathons when I was 47. I've run 22; my personal lifetime best is 3.17 hours. I spend five hours a week in vigorous walking or easy jogging. I work out with a trainer twice a week. I feel I should do more. I have a body-mass index of 22 and am comfortable there. I try to eat semi-intelligently. I have never smoked. It has got to be one of the stupidest things. I have never met [Jim Simons of Renaissance](#), the greatest quant hedge fund guy ever, because he was a chain smoker and I didn't want to go into his office. You should think about your overall health and fitness plan. You are your own best health manager. Get started by telling yourself: Some is better than none, and more is better than less.

Q: Thanks, Ed.

Ed Thorp's Rx for Health and Long Life

We asked Thorp for his anti-aging secrets. He gave us a detailed description of his health regime.

1. Physical

- a. Cardio. Weight-bearing such as hiking, running, walking helps bone density.
- b. Core strength & flexibility (yoga, stretching, core strength)
- c. Weight training. Critical for overall strength and to avoid bone loss
- d. Balance is important to maintain--many older people are done in from falls.
- e. Keep an exercise log.

2. Diet.

- a. Eat low fat.
- b. Don't eat a lot of animal protein, nor red meat; avoid fish with lots of mercury.
- c. Consume fresh fruit, vegetables.
- d. Avoid refined sugar, especially fructose, and worthless starches like white rice and mashed potatoes.

3. Control your weight and cholesterol.

- a. Keep your weight down, with a body mass index of less than 23 if possible.

Pick a weight target. Weigh yourself regularly. Write it down whether you like the number or not. If you won't do this, you are not serious about change.

b. Keep your total cholesterol below 180, preferably below 160.

c. Watch your belly fat. A potbelly reduces longevity because the fat exudes substances that injure your organs. "Apple" shapes die sooner, on average, than "pears."

4. Don't smoke; avoid others who do.

5. Avoid too much alcohol. One to two drinks maximum and not daily.

6. Reduce stress. There are lots of tricks for this.

7. Get regular checkups and tests. You need access to good doctors and medical coverage.

a. Be proactive. If you have a problem, deal with it soon before it gets worse.

b. Get vaccinations. All the standard ones plus Hep-A and B; pneumonia.

c. Get bone density tests and other baseline measurements.

d. Get a flu shot every year and as early as possible for maximum protection.

Lots of smart people I know neglect this. I've never had the flu.

8. Take supplements. It's very important for nutrition, to avoid bone loss

a. Among them: COQ 10 (antioxidant); Calcium/Magnesium/K2 (for bone loss); Life Extension Mix multivitamin (half or one-third dose); baby aspirin (reduces inflammation, possibly protects heart); fish oil (address inflammation, cholesterol, etc.); Super Zeaxanthin (for eye protection).

b. This can be hard on the kidneys. Take a drug holiday and go off for a week or so occasionally. And limit supplements to ones you can make a strong case for.

9. Avoid unnecessary risks, such as motorcycles, on-road bicycling, second- and third-world airlines, autos with low safety ratings, certain extreme sports, eating Gulf seafood.

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ECONOMY AND POLICY

Today's Jobs Report Is a Big Moment for the Federal Reserve

By [Matthew C. Klein](#) Sept. 6, 2019 5:00 am ET