Chaos theory, which proposes that there are patterns to chaotic systems, has been on my mind. The idea is often explained by the example of a butterfly flapping its wings, which sets off a complex series of events that lead to an extreme weather event in another country. Fittingly, a meteorologist, Edward Lorenz, developed chaos theory with his assistants, Ellen Fetter and Margaret Hamilton.

Superforecasting: The Art and Science of Prediction by Philip E. Tetlock and Dan Gardner says that chaos theory "shifted scientific theory toward the view that there are hard limits on predictability."[1] That view might discourage people like me who try to anticipate and profit from changes that we view as predictable. However, the book does offer hope, even in Lorenz's field of weather forecasting. "It's a never-ending process of incremental improvement that explains why weather forecasts are good and slowly getting better," say the authors.[2]

Successful forecasting isn't only for professional forecasters. In fact, nonprofessionals can outperform professionals. In a forecasting tournament sponsored by a U.S. intelligence agency, the authors' Good Judgment Project team of "intellectually curious laypeople" outperformed intelligence professionals in forecasting political and economic trends.[3] These nonprofessionals succeeded because they pooled information differently than the professionals. What is meant by pooling information differently? An article in Management Science by Ville Satopää suggests superforecasters may excel because they pick up subtle signals, control their biases, and screen out "noise."[4]

Techniques recommended by Tetlock and Gardner in the chapter "Ten Commandments for Superforecasters" are consistent with how I look for investment opportunities in a chaotic mix of data.[5] Those techniques are:

- "Break seemingly intractable problems into tractable sub-problems."
  As the authors say earlier in the book, "…by breaking down the question, we can better separate the knowable from the unknowable."[6] Incorporating knowable information to solve sub-problems improves the accuracy of solutions to the larger problem.
- "Strike the right balance between inside and outside views."
  The "inside view" looks at the specifics of a situation to identify what conditions are necessary for a hypothesis to be true.[7] The "outside view" involves identifying the "base rate—how common something is within a broader class."[8] Forecasters are often drawn to the "inside view," but the "outside view" provides a powerful corrective.
- "Strike the right balance between under- and overreacting to evidence."
  "The best forecasters tend to be incremental updaters," write the authors.[9]
- "Look for the clashing causal forces at work in

[1] Superforecasting, p. 9
[2] Superforecasting, p. 14
[3] Pp. 16-17
[4] Ville Satopää, Twitter post, March 21, 7:18 a.m., https://twitter.com/VSatopaa/status/1373640206646149121
[5] Pp. 278-281
[6] P. 111
[7] P. 121
[8] Pp. 117-118
[9] P. 280

each problem."
It's an art, not a science, to reconcile conflicting information.

As I use these techniques, I apply a variant of Bayesian analysis, which, as *Superforecasting* says, has a "core insight of gradually getting closer to the truth by constantly updating in proportion to the weight of the evidence."[10] This helps me to identify meaningful patterns in chaotic systems that others overlook. I agree with the words of Charles K. Kao, who's known as the founder of fiber optic communication: "Ideas do not always come in a flash but by diligent trial-and-error experiments that take time and thought."

My process leads to ideas that do not follow the crowd. For example, I am investing in Chinese e-commerce companies despite people saying the Chinese stock market is overvalued. I look instead at the fact that e-commerce accounts for only about one-fourth of retail sales in China. Those sales have so much potential to grow. Also, China is still a relatively small, but growing piece of international stock market indexes. In the MSCI ACWI Index, China accounts for about 5% versus more than 57% for the U.S.[11] That's quite a contrast, especially when you consider that China's economy, like those in other emerging markets, can potentially grow much faster than the economies of countries in the developed world.

I am also considering additional opportunities in energy, which has shrunk to be the smallest sector in the Standard & Poor's 500. For now, I'm hanging on to my current energy holdings in anticipation of the economy reopening. I believe energy prices will pop more at some point. Eventually of course, renewable energy will be the way to go instead of oil and gas. As the global population grows, renewable energy offers one of the only ways to restrain carbon emissions while satisfying increased demand.

I am seeking out these opportunities in the context of my belief that traditional 60/40 portfolios—60% stocks, 40% bonds—cannot succeed with interest rates so low and stock valuations at all-time highs. Going forward, investors can't count on the 10.2 percent average return offered by a 60/40 portfolio over the past 40 years.[12] Instead, investors need to incorporate new data into their models.

Bonds used to offer attractive potential to rise in price when stocks fell. Traditionally, a "flight to quality" during crises depressed bond yields while boosting prices—a powerful strategy as bond prices have fallen over the past 40 years. However, with the 10-year Treasury yielding around 1.7%, there's not as much room for rates to fall. Nonetheless, in the longer run, I believe U.S. interest rates will make all-time lows. In the interim, we just went through a phase of rising bond yields, causing prices to fall. For example, as of March 30, U.S. corporate investment grade bonds had recorded the "second-largest quarterly loss on record," according to a report discussing their -4.2% year-to-date total return.[13] Our emphasis on avoiding losses in client portfolios makes traditional static bond investing unattractive. But we do find ways to incorporate bonds into client portfolios. For example, we believe in prudently adding credit risk with bonds that behave

[10] P. 171
[11] https://www.msci.com/documents/10199/8d97d244-4685-4200-a24c-3e2942e3adeb
[12] ttps://www.ft.com/content/fdb793a4-712e-477f-9a81-7f67aefda21a
[13] Lisa Abromowicz, Twitter post, March 30, 2021, 9:08 a.m., https://twitter.com/lisaabramowicz1/status/1376884112540192770

in a more equity-like way. Within stocks, we continue to search for stocks that we believe offer a margin of safety.

As always, thank you for the trust you have placed in me and in 7Summit Advisors. We work hard to earn that trust each day.

Sincerely yours,

Li Chang