**Topic:**

**Investing in Today’s Challenging Environment**

**Presenter: Dr. Fan Xiwen**

**Below transcript is based on Dr.Fan’s live stream lecture on Xiaoetong on Nov 16.**

Good evening, everybody. I'm very pleased to have this opportunity to be invited by School of Finance at Renmin University of China to give you a lecture and share with you some of my thoughts in investment field. So, the topic I'm going to do today is **Investing in Today's Challenging Environment**.

My topic is a little misleading in a way, because instead of talking solely on today's investment environment, I probably would like to make some observations about the history of finance. One of the advantages being at my age is that I have heard a lot and experienced a lot. So, I would like to give you some of the historical perspectives of what I have observed in the past several decades.

My name is Fan Xiwen, and I am the Chief Risk Officer at China-LAC Cooperation Fund, a sovereign PE Fund specializing in Latin America with a very broad mandate. Our fund was announced by the government several years ago with a $10 billion commitment to invest along the way. Before the lecture, I realized that the first challenge we must overcome is the setting in an online class. I don't want to put you guys to sleep right away with a lot of materials that are difficult to digest, especially in a language that is not my first. So, rather, I'm going to try to make it interesting to the best I can.

First, what I'm going to do is to put on as few slides as possible so that it won't distract you from the lecture. Second, if it is possible, I hope you and I can make it more interactive. I know that you're not allowed to speak on this software, all you can do is to write your questions on the question window. So, I would encourage everybody who has a question to send your questions to the question window. Then, I can see them on time. Don't be afraid of interrupting me. When I see your questions, I may pause and answer your questions. Finally, I have previous experience working in the United States for quite a long time, altogether 20 some years in New York. Therefore, my perspective today is mostly from the capital market of the United States, with a little bit shift into Chinese market. Please forgive me for giving such a narrow focus of my lecture.

Investing is a huge topic. There are so many aspects and so many different perspectives we can cover. But instead of the following way, we will along other frameworks or along any theoretical reasoning. What I'm going to do is to try to blend my observations on the important trends in the investment field in the last several decades, with some examples or stories that I can come up with, in particular, with me being around for quite a while, I would like to provide some historical perspectives from the US capital market. Hopefully in this way I can keep you awake for the next 2.5 hours. To be more specific, I’d like to talk about one and half hours and leave about an hour for the Q & A section. But as I said, I encourage you to send your questions along the way if you have any.

When I started on my career in the mid 1990s in America, investment was rather different from what it is today. At that time, alternative assets are barely parts of the investable asset classes. Big data, Fintech, high frequency trade were yet into the jargon of Wall Street investors. Hedge funds were few and did not occupy the front pages of the newspapers. Peter Lynch of the Fidelity Investments, it was one of the big names in the stock investment arena, who created an incredible track record of an average return of 29.2% from 1977 to 1990. That is a record better than Warren Buffett’s for the same period.

Peter is not only famous for his ability to pick stocks, but also his memorable wisdom for investments. For example, he said, “know what you own and why own it” referring to own the stocks of course. He also said, “the real key to making money in stocks is not to get scared out of them”. Another quote is like this, “there's no such a thing as worry-free investment”. The trick is to separate the valid worries from idle worries, and then check the worries against the facts. Here is the final quote I really like, he says “far more money has been lost by investors preparing for corrections, or trying to anticipate corrections, than has been lost in corrections themselves”. That's very true for a lot of people, including myself. In the 1990s, the market began to reckon with many changes that had occurred in a decade earlier, allowing the following period of stagnation, deregulation, in attached form under Reagan’s administration. That is a decade in which so called “the golden era of investment” had just begun, and forever lasting bond bull market had just emerged due to the falling interest rate.

The 1980s also ushered in one of the most important historical periods of the PE industry. As you can see from the slide, the historical behavior of US interest rate from the 1950s. Then you can see that the interest rate reached the all-time high in early 1980s, due to high inflation that happened at that time. You may remember that in the 1970s, oil prices went up twice significantly, which pushed inflation up and up. Therefore, interest rate increased to the historical level at almost 20%. But from the early 1980s, the interest rate started falling gradually and slowly. Now it has fallen to almost zero at this point.

So, in the 1980s, the PE market also saw mega transactions such as hostile takeover occurred during that period through mostly leveraged buyout. In 1989, such transactions reached its culminating point at $31.1 billion. The hostile took over the RJR Nabisco which is a tobacco company in North Carolina. It is the largest take over in the history of PE industry then. This is the period doubted by many historians in the area of ruthless capitalism. I don't know how many people in this audience have ever read the book about this take over, *Barbarians at the Gate*, which is quite famous as a collection of several investigating reports by two journalists at that time.

When talking about the history of leveraged buyouts, it won't be complete without mentioning a famous or notorious investor named Michael Milken. I’m pretty sure that some of the audience today have heard about his name. He was an investment banker widely considered as someone who single-handedly created the junk bond market in the 1980s in the United States.

Michael Milken went to Berkeley for his undergraduate studies in the 1970s. Then he received his MBA degree from Wharton School for University of Pennsylvania in the 1980s. Upon his graduation from Wharton school, he joined Drexel which later merged into Burnham, eventually the firm became Drexel Burnham Lambert Inc. While he was attending Wharton, he wrote an essay in which he made an interesting observation. On the basis of per unit of risk, the government bonds were inferior, or much less attractive compared with the bonds, whose credit ratings have fallen below investment-grade. By definition, these bonds are also called non-investment-grade, or high-yield bonds, or simply junk bonds.

I'm sure many of you are familiar with the credit ratings but others may not. Let me explain a little bit about credit ratings to what we mean of the junk bonds or non-investment-grade bonds. We all know that the credit rating goes from as low as D, which means default all the way up to AAA, which represents the best credit quality, whereas the D rating represents the worst. So, in between there's a series of credit ratings matching the corresponding credit quality of the issued bonds.

In the industry, by tradition or convention, people usually call any bonds that are rated above BBB or above investment bonds or investment grades or any below it would be called as non-investment-grade, or simply junk grade or high-yield grade. That's how the name comes from, again, BBB- is like the water shed between investment-grade and non-investment-grade. Of course in the rating business, you have Moody’s, S&P and Fitch, for S&P and Fitch, they go by like miners, plus, whereas for Moody’s, it would go by like 123, for example, the BBB- would be BBB3 for Moody’s. I’ve talked enough about credit rating explanations. Although many believe today that the junk bond exists way earlier than Michael Milken’s time. His essay laid a foundation for what was thought nothing short of a revolution on Wall Street. Before Michael Milken, no Wall Street firms were making consistent effort to push for establishing a full-fledged market for junk bonds.

I joined banking industry in 1995 in the United States. I remember that for one time I went to Bear Sterns to talk to people with my mentor about the loan market. Bear Sterns at that time was considered pretty active with the loan market, but there was no leader in the junk bond market. Michael Milken took a notice of it. Quickly, he turned Drexel Burnham Lambert into the unparalleled leader in this phase. But in the mid 1980s, Milken’s network of high-yield bond buyers, notably Fred Carr, an executive life insurance company, and Thomas Beagles and Saving & Loans had enough buying power that reached whatever the size that can enable Michael Milken to raise a large amount of money quickly. It's quite interesting if you know this part of history. But now, Michael Milken was credited for single-handedly creating a junk bond market.

The buyers’market was quite small, the active buyers were not big firms, big institutions like bank or investment firms like Goldman Sachs. They were smaller players in the field as I mentioned earlier, couple of smaller institutions like Fred Carr, a life insurance company, another one is the Saving & Loans, which is quite an interesting type of depository institution. It's not a bank, but it ends up as a category of depository institution, which is more or less like a party union where the depositors belong to a certain industry or certain group of companies. So, the money raising ability facilitated activities of leveraged buyout, which is another popular thing.

In the 1980s, at that time, the aggressive investment companies like KKR or Black Stone, and some other investment banks, they were using leverage in the mergers and acquisition activities. That is what we call leverage buyout today. Without a junk bond market, the leverage buyout was almost impossible because it was very difficult to raise a large amount of money to facilitate the merger and acquisition activities. So, the money raising ability facilitated activities of leverage buyout firms such as KKR and of so called Greenmailers, maybe many of you have never heard about it before.

In 1980s, the hostile takeover was quite popular. By greenmailers we mean that those investors who would like to purchase a bunch of shares of targeted company, which means the target of mergers and acquisitions to threaten a hostile takeover. That would force the existing shareholders, or even management, to buy back their shares at a much higher price or other premium. Therefore, the greenmailers can profit lot of money in this way. They would go in and buy a bunch of stocks at the low price threaten to take over, therefore, forcing the existing shareholders to buy back the shares at higher price, these people are called the greenmailers. So, greenmailing is practice of buying enough shares again in the company in order to profit. Regarding mergers and acquisitions, the company makes greenmail payment as a defensive measure to stop the takeover bid, so, this is how these existing shareholders defend their company to avoid hostile takeover. The target company must repurchase the stocks as I said earlier. So, most of them were in with highly confident letter from Drexel, I mean, the attackers or the buyers, the highly confident letter was used quite widely by the attackers at that time, especially the letter issued by Drexel. This is the kind of a tool that Drexel Burnham Lambert’s corporate finance unit crafted that promised to raise necessary debt in time to fulfill buyers’ obligations. Without the letter, sometimes the buyers wouldn't be able to secure finance and they needed to finish their rate. Michael had a reputation for being able to make a market for any bond that is on the road.

Milken not only became the king of the junk bonds, he also made himself a Fortune as well by being the king, he made about $5 million in Drexel at that time, plus other rewards he recruited from his aggressive activities. Michael Milken was much earlier than the finance industry. But when I joined the financial industry in the United States, his name was quite popular for a lot of reasons. He was a very energetic individual, he worked in New York City, but he wouldn’t live there. He lived in Los Angeles, to be exactly in Beverly Hills, flying with his helicopter maybe a couple of times a week to New York, then he would take a lot of reports or investment proposals back home. He would read them at home for a long time, and when he come back to the office next morning, he would raise many questions and would understand the deal better than anybody else. But in 1989, a federal grand jury indicted Milken on 98 counts of racketeering and fraud. The indictment accused Milken of a litany of misconduct, including insider trading, stock parking, basically stock parking is a way to conceal the real owner of the stock while maintaining the appearance of regulatory compliance. It's quite popular in New York. Some firms would help clients to do this kind of transactions, precisely because a lot of clients do not want to reveal their names and trading for whatever reasons. So, he was accused not only the stock parking on insider trading, but also tax evasion, and numerous instances of repayment of illicit profits.

Ivan Boesky, who was also well known at that time, paid Drexel $4.3 million in 1986. That wasn't quite big in today's measurement, but at that time, 4.3 million was huge for Michael Milken, share of profits from illegal trade. This payment represented the consulting fee to Drexel. Surely afterwards Milken resigned from Drexel, and soon after the firm clashed and closed as well. On April 24th, 1990, Milken pleaded guilty to six counts of securities in tax violations. Interestingly enough, the prosecutor to Milken’s case was Rudolph W. Giuliani, who was then the US attorney for southern district of New York.

Milken was banned from ever coming back into the financial market for his lifetime. After he served his time in prison, he became a philanthropist, making donation particularly to health industry. He suffered illness, a prostate cancer and later he pushed really hard for the cure for the disease. It didn't succeed, but he made a big progress in this field. Later, he was able to keep the advantage of newly invented treatment for his own suffering. I believe he's still well, and in February 2020, Milken was pardoned by president Trump. So now he is completely free.

High-yield bonds become an asset class, and they have produced superb long-term returns compared to investment grade does in the past few years. If you invested a hundred dollars in high-yield bond at the beginning of 1980, it would return $3523.30 to you at the end of 2019, implying an average annual compound rate of return of 9.31%, and 7.61% for investment rate, that's almost more than 2.5 percent higher than investment bonds, and 11.19% for stocks. It has not been as high as stock yet, but it's getting close.

On the next slide, I would like to show you the comparison of the returns on the high-yield bonds, investment grade bond, as well as stocks. From the 1980s all the way to 2019, you can see for the past 40 years the high-yield bonds have consistently produced results that are comparable to the stock market. In couple of interesting periods that worth noticing is that, for example, during financial crisis of 2008 and 2009, you can see the junk bonds fell quite deeply, at 26% compared with 37% of stock market. But somehow it bounced back also strongly at a very high rate.

Let me keep a few historical factors in perspective when you're looking at these returns. There was much higher representation of fallen angles in the early days of the high-yield investment grade market, then there is that day. By fallen angles, we mean that the bonds that fell from investment grade to non-investment grades through downgrading by the rating agencies. For example, a bond may initially be graded as AA, but for some reasons, the company didn't do well. And later it was downgraded below investment grade. This is the kind of company we call it fallen angels to earlier days, and there were more fallen angles than there are today, because being rated as a junk bond wasn't quite popular at that time.

Second, all the down years for high-yield bonds caused by economic slowdowns in 1989, 1990, 1994 and 2000, or by financial crisis in 2002 and 2008, everybody knows in the credit market in the United States, there were what we called a Tri-Peak time for corporate default in the past few decades. The first one occurred in the late 1980s or early 1990s, from 1989 to 1991. Market saw the huge job and the default rate for the corporate bonds during that time, the default rate at that time reached like double digits, around 11% for two years in a roll. The second peak incurred at the beginning of the century, the early 2000, the American economy suffered a moderate recession. At that time, corporate defaults, once again, went up quite high in 8% to 9% two years in a roll. And the third peak, as you can imagine, happened during 2008 and 2009 of the financial crisis throughout the globe. At that time, corporate default picked up significantly one more time, reaching a double digit. So, that's what we called Tri-Peak time of massive corporate default.

Third, the yields were much higher in the past than they are today. While the absolute yields from 2012 to 2019 were at 5.1%, this level could have been unheard of in previous years, not because it is so high, it is way too low. The period of 1980 to 2011 generally saw yields in the mid-teens, and the average annual rate return during this period was 15.9%, even during the lowest period of the late 1990s, the high-yield bond still yielded 8% to 9%. In the last 40 years of bull market for the bonds, the high yield returns have gradually slowly calmed down for the mid-teens to now as low as 5%. We mentioned earlier about the bond bull market that began at 1982, as a result of a falling interest rate. But it never said continued up to today. To understand this, we calculated annual compound rate of return from 1982 to 2019 to yield 6.15%. This outperformed the previous period from 1928 to 1981, which produced only 2.97%.

The mid 1990s witnessed the emergence of internet and the World Wide Web, which ushered in a new brand of great companies to the state of global business, shaking up the existing order of old paradise of doing business. This is a time when new commerce threatened survival old gods. Next table shows the global top 10 companies with the highest market capitalization over the past 23 years. This is the slide shows the global top 10 companies by market cap. From the right side, which is the list of the top 10 companies in year 1997 or 23 years ago, you can see this list of companies is quite diverse, such as GE which is a conglomerate, and Microsoft, a high-tech company, and Nippon Telephone and Telegraph, which is a tele communication company. And Royal Dutch Shell is an oil company, and Exxon Mobil is another oil company, and Intel Corporation, which is making computer chips and coca cola company, and Toyota Motor company, an automotive manufacturer, and finally, Novatis and Merk are both pharmaceutical companies.

Fast forward to year 2000, the list of names changed a little bit, but not much. We can see that GE and Exxon Mobil, and Royal Dutch Shell are still on the list. Somehow this time we began to see financial institutions joining the list like Citigroup. And there was a retail giant like Walmart included on this list for the first time. Now, 10 years later, in 2010 the global top 10 companies Mkt Cap was evolving, but still maintaining some sort of diversity across different sectors. In this case, again, you see oil companies and high-tech companies, and banks, for the first time that banks from China came on top of the list like China Construction Bank and ICBC. Now today ICBC is the largest bank in the world.

But today at the end of the 3rd quarter of this year, the list is completely different from what it was before. It has never been so concentrated in the high-tech industry before. Among the list, we can see Apple, Microsoft, Amazon Alphabet, which is the parent company for Google, and Alibaba, Facebook and Tencent. The top seven companies are not only high-tech companies, but also from two countries only, the United States and China.

The rest of the list are Berkshire Hathaway, which is the company headed up by Warren Buffett, and Visa, which is a credit card company, we don't see banks anymore, even the largest bank in the world is not on the list. And interestingly enough, we see TSMC, which is a company in Taiwan, somehow find a way on this list, it is the No. 10. The evolution of this top 10 list is quite revealing and shows the trend of the world economy, quickly converting to the high-tech industry. Today, the high-tech companies are being valued more than any other type of companies.

However, the internet bubble burst in the late 1990s and early 2000 over the top valuations of new companies, both the value destruction and creation accelerated since that. The new matrix of how to evaluate the company grabs attention of market participants. Because the valuation by traditional measures such as PE or PB ratios couldn't justify the lofty prices of internet-based businesses. New companies without generating a penny of net profits, like Amazon at that time, could be far more valuable than the established ones, such as Ford or even GE.

Few stories are more illustrative to the divergence of valuation of old and new business such as blockbuster, Netflix in the US. I guess many of you know that, it's a streaming company that was invented in the early 2000, where the Blockbuster as a traditional video rental business. Blockbuster, officially known as Blockbuster Video, was an America-based provider of home movie and video game rental services. Services were offered primary at video rental shops, but later alternatives included the DVD by mail, streaming video on demand, and a cinema theatres. I remember in the 1990s, almost every street mall in America has a Blockbuster store. Before Blockbuster, the video rental business basically was run by the “mom and pop” type of business. At the corner of the street in your small town, there may be a video store where you can rent movies. And later these movie stores were wiped out by Blockbuster because Blockbuster can run at a much lower cost with much higher efficiency and offering much more standardized services.

The thing is, the good time for Blockbuster didn’t last very long, at the peak in 2004, Blockbuster consisted of 9094 stores and employed 84300 employees across the main countries, among which 58500 were in the United States and 25000 were in other countries. In 1994, Viacom, which is huge company, bought Blockbuster for $8.4 billion.

However, the poor leadership and the competition from Netflix mail-order service and the video on demand services were major factors leading to Blockbuster’ eventual demise, it began to lose significant revenue during the late 2000. And it filed for bankruptcy protection in 2010, the following year, its remaining 17 hungry stories, and the stores were bought by the satellite television provider, Dish Network. In the early 2014, the last 300 company-owned stores were closed.

The story about Blockbuster didn't end there. At the spring of 2000, a man named Reed Hastings traveled to Dallas, to meet with the management of Blockbuster, that's where Blockbuster was headquartered. He had a big business idea for the movie rental giant. He proposed to Blockbuster to buy his small business for $50 million. At that time, Hastings’ Netflix lnc. was a promising business, but had hard time making even a penny as profit.

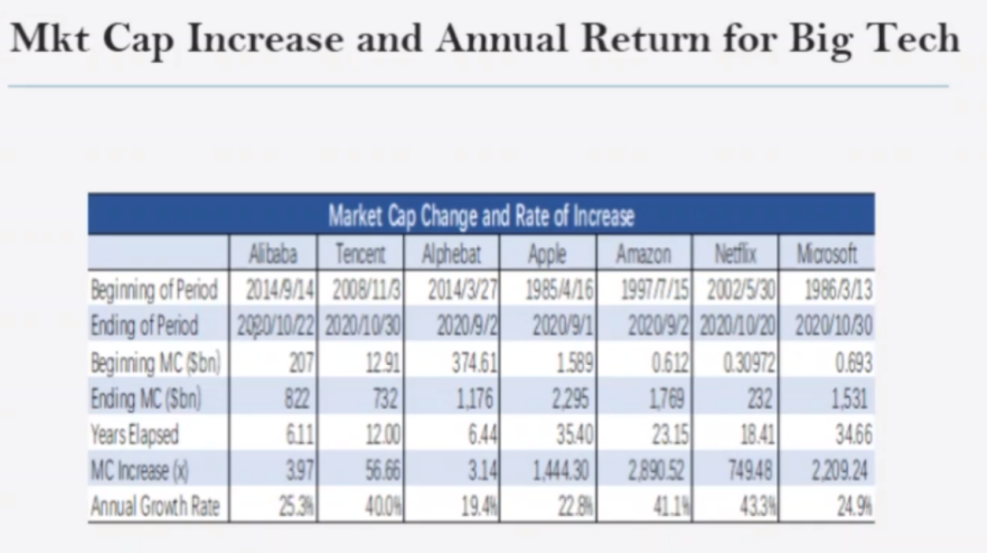
But at the time Hastings met Blockbuster, the company was small and in the struggle to make money. Hastings believed that his proposal made a lot of sense. Blockbuster had customers base and Netflix could offer new technology. But they lacked access to capital, however, Blockbuster turned down Hastings’ proposal, essentially the management of Blockbuster. Their people were told, laughed Hastings, out of their conference room. But the rest of the story is known to everyone in the world, around 2007, Netflix made a brilliant move and began transitioning into America's NO.1 movie and TV streaming service, just like Aiqiyi in China, this innovation crushed traditional brisk and motor rental companies like Blockbuster.

In 2002, Netflix had three million subscribers, but in 2020 it in total has 183 million subscribers. It's market capitalization raised roughly $150 billion while Blockbuster is worth Zero and is in liquidation at this moment. Blockbuster went from American value of $8 billion to bankruptcy in less than nine years. Its shareholders lost almost everything, its decision not to purchase Netflix is considered as one of the worst decisions in modern corporate history.

In the past two decades, many companies with the size of workforce, huge customer base, and significant revenue generating power started losing their way to continue their business. This is known as the law of accelerating returns. The rate at which these huge disruptions occur with the speed over the coming decade, usually these new companies would experience some moderate advance until they reach the liftoff state. After that, everything begins to accelerate. By the same token, those companies which failed or adapted to the new world order lose their value at a much faster pace than they have ever seen before.

Next table shows both winners and losers in recent years. There are some interesting observations. As shown from the chart, the bar on the left, typical fortune 500 companies typically took 20 years to get $1 billion capitalization. However, in 1998 from Google, it took less than 10 years, at least nine years, to reach 1 billion capitalization. And time is shorter and shorter for the late comers like Facebook, Tesla, Uber, etc. And you can see that Oculus, a company no longer doing very well, took only two years to reached $1 billion, very quickly.

I put together this table to show you a similar idea. That is basically the market capitalization increase annual return for big techs. I put together the seven companies on the most recent top 10 list, and show the following information. If you go by the third column shows the beginning of the period. For example, for Alibaba, the beginning of period would be the time of IPO, which was September 14th, 2014. And ending period, it would be roughly now. And beginning market capitalization, it was the date I just showed you and the ending capitalization is the capitalization on the ending date.



Years elapsed is the years between the beginning of the period and the ending of the period. So, the second column from the last is market capitalization increase by times, for example, like Alibaba, the market cap increased by 3.97 times. The annual growth rate for Alibaba is 25.3%. If you go from left to right of this table, you can see these great high-tech companies consistently deliver very strong annual returns, such as Tencent, the market capitalization increased by 57 times and annual growth rate is 40%, and so is true for Google, Apple, Amazon, and Netflix.

The lowest return generated by the top seven high-tech is Alphabet, delivered 19.4%, still high enough to beat S&P at 11.3% by significant margins. Of these companies. Tencent and Alibaba from China both made investors top on annual returns, 40% and 25.3% respectively. It’s the first time in history that US and China together share spotlight of the global market top tech companies, these companies are the darlings of the adventures today. More recently, other tech stocks, like NVIDIA英伟达, Skyworks Solutions, have delivered the gaze of thousand percent return to 3000 percent return during last few years. But now you can see the time it takes to massive change is getting compressed. Examining the investment history, no one had ignored the great recession of 2008 and 2009, which is all relevant to financial glooms. In 2009, Blackstone group CEO Stephen Schwarzman said that up to 45% of global wealth had been destroyed by the global financial crisis. Then March 9th, 2009, The Dow had fallen to 6440, or the 54.3% decline from its peak in 2007, exceeding the pace for market fall during the great depression of 1929 to 1932.

This is S&P covering the period all the way through 2012. Even though we didn't show the chart all the way to today, you can see the steep drop in S&P 500 during global financial crisis in 2008 and 2009. At that time, the US also experienced the deepest economic downturn since the World War Two. Before 2008 and 2009, the US economy never experienced negative growth four quarters in a roll, but this time it did. Let me show you this.

The chart on the right side of this slide shows the GDP growth by quarter during the period of 2004 Q4 to 2010 Q1. So, the unemployment rate hit its records as well. People lost their jobs, particularly the pace of which jobs were losing trigger a call for government intervention. During that period, the jobs were lost at a very high level, almost 1 million jobs per month. Let me show you another chart which shows the unemployment rate in the US during the great recession. And the percentage of long-term unemployment is the total unemployment.

So, how did the recession occur? What is the cause of it? To answer that, we need to start with a few years back. Following the mild recession, in the early of this century, the Federal Reserve began around a reduction in the federal funds rate. In order to stimulate the economy, the federal funds were gradually falling down from 6.44% in May 2000 to less than 1% in May 2004, a level that the market had never seen since 1954, that was a long time ago.

To seek a better yield, Wall Street began to create the product to use leverage to enhance investment returns. At that time, the structured products, such as CDOs (Collateralized Debt Obligations), and ABS (asset-backed securities), were already quite popular, and the leverage was used in these products as well. However, in order to turn up the yield to meet investors’ need, the new products called ABS CDOs, or structured finance CDOs emerged as new ways of getting returns. Quickly, investors from all over the world flocked to appealing of these products.

ABS CDOs are nothing but the leveraged products using ABS as the collateral created structures at that time, ABS also evolved from its original forms to the new forms, in which more asset types were being added as collateral. One of these underlying assets would subprime mortgage loans. Before the turn of the century, subprime loans were there but not that popular. But the interest rate was falling, refinancing the mortgage loans began to push housing to rise. As monthly mortgage payment was down, more Americans could afford to buy bigger houses by borrowing money from banks, those borrowers with low income and a credit history, all of a sudden became the prey of the subprime lenders.

The so called the subprime borrowers are referred to the borrowers whose FICO scores are below 660. I don't know how many of you know what the FICO score is. Actually, FICO score was developed by a company called FICO companies to provide a way to measure the creditworthiness of individual consumers. As the home price goes up, lenders became bolder and bolder at taking risk of borrowers, the logic is very simple, that is, with the rising home price, the lender can always dispose the assets at a sufficient high level of price to recover loans if the borrower was default. So, this simple idea eventually became the driving force behind flourishment of some prime lenders in the first seven years of 21st century.

Around this time, other types of creative products were born, too, allowing investors to take the leverage in other forms. For example, synthetic execution,such as CDS, paved the way for investors to add exposure to risks without too much outlet of cash. Similarly, brokers and dealers on Wall Street began to set up so called correlation desks one after another to meet the needs of investors who could further use synthetic executions. All of these are nothing but a hidden way of securing leverage. At the very beginning, everything was doing well. Defaults were relatively rare and returns were good, products were plenty for investors to pick and choose. More importantly, garbage assets were finding their own homes in these new products, which were packaged together at a faster pace by Wall Street firms than ever before.

Massive frauds occurred at that time, borrowers provided fake personal information to get more loans. Mortgage brokers sometimes clued with borrowers to do so. Even lenders showed the willingness to deceive in creating legal documents, because the more money they lend, the more bonus they would receive. At the time of early 2000, cracks began surface as the default of these subprime lenders could make their mortgage payment, the banks have to foreclose homes. This, in turn, led to disposition of the homes, the owners of which had defaulted. With these things happened more often, the home prices started to fall, then triggering more defaults. If the defaults piled up like that, the underlying assets of subprime ABS began to have problems, which then caused ABS DCOs to generate the losses. And this is a circle finally began on its own. The rest of the story is now known to everybody.

Here's a story I would like to share, a real story. A borrower in California borrowed money to buy a huge home. In California, the law does not allow the bankers to recourse on the assets other than the home itself. So, you cannot go after the borrowers’ other assets like cars, or jewelries or whatever. This borrower borrowed money from the bank to buy home, but later, because the home prices went up by quite a bit. So, other lenders went after this borrower and said, “hey, do you want to borrow equity loans, which means you can use the same house you use as collateral to borrow from your first banker, but use the mortgage of your equity in the home to borrow a second loan. So, this borrowing ended up borrowing an equity loan.

Now he has two loans, the first loan he borrowed from the first banker and the second loan is borrowed from an equity lender. But as time turnaround, home prices began to fall. He started running into problems. With this second home loan, what happened to him is he bought a new car, a Landover SUV and he took his whole family to Florida for a-week-long vacation. Then he came back and packaged all the things into the big SUV, and then drove his whole family to Texas. And over there he bought another home with cash that just borrowed from the equity loan. So, after that, he defaulted on his first loan, in other words, he no longer repaid the first loan. But his first banker wasn't allowed to go after his second home, which he bought in Texas. Because in California, the law didn't allow bankers to recourse other assets. The first home he bought in California was the only asset the bank could get hands on to recover its loans.

This is a real story and this guy was not alone. Do you know what happened to him later? He still had his old job in California. He took flights every week from Texas, flying over to California to work, and over there he rent a small apartment at college for him to stay over the week. Story like that wasn't rare at that time. It was estimated that the total realized loss incurred by global recession at that time was over $2 trillion, which did not include subsequent reduction and valuation of assets. Investors learned a big lesson, so did the government, regulators across globe. There are many lessons to be learned from the episode of the financial crisis in 2008 and 2009 period. However, if there's one thing that must be singled out that couldn't be held countable for this crisis, was assets leverage that was applied everywhere and financial activities in phase of the low interest rate environment. In particular, when the use of a leverage was tied to housing market, it's bound to trigger the collapse with this financial crisis. Fast forward to the year of 2020, investment is never more exciting and full of uncertainties. At the same time, it is a daunting task to generalize what is going on in the investment world. But at least, we could try to make a few observations.

The first observation I would like to make is that technological advancement has never been at such forefront across many fields, like what we see at the moment, investors are raising to identify investable innovation platforms. According to

Catherine Wood, CEO at ARK Investment Management, an innovative platform is essentially driven by the Wright’s law, which was pioneered by Theodore Wright in America in 1936. And it states that for every cumulative doubling of units produced, cost will fall by a constant percentage. Theodore calculated for the airplane manufacturing businesses, so as Ms. Woods pointed out, as the cost falls at a constant rate, and the prices come down, it tends to unleash waves of demand for the products, triggering exponential growth for the market. So, the innovative platforms lead to cut of the costs across the economic sectors and lead to the cause across the world. That needs more innovations. So, that’s why there is multiple innovation that could occur at the same time as we see today. This happened in the late 19th century and early 20th century with telephone, electricity, internal combustion engines being developed. Now these platforms are going to transform every industry and every company in the world. The innovation platforms today are artificial intelligence, Fintech, gene sequencing, energy storage to name a few, and the list can go on and on.

Take payment system as an example. In the past thousand years, the first contract came along in the 1100s. Then in the 1900s, the first stock exchange emerged, in Spain I believe, the financial payment system then evolved with the development of the banking system and it remains the same until Amazon’s one-click payment. Then PayPal, Alipay, WeChat pay. Without entering the banking system. China and other emerging companies, like countries in Africa and Latin America were able to develop payment system on mobile phones very quickly. In China, for example, the mobile payment volume was about only $0.9 trillion in 2014. By the time of 2018, it grew to $26 trillion. Only in four years, the number has doubled more than four times. The thing is that many of these activities not measured in GDP. So, as Cathie Woods pointed out that the Fintech is going to grow in volumes way more than what GDP matters.

In a broader term, the digital economy has tremendous room for growth in the next few years, or perhaps the next decade or two, contributing trillions of dollars to the global economy. In this development, I believe China is very well positioned to become a leader in the decades to come in terms of applying AI technology and big data technology to many different scenarios, US then will also continue to lead in the fundamental technological advance, in my opinion. By setting observation historically, technical advance has important implications on the monetary policies or monetary phenomenon. Today, all new innovation platforms are deflationary as they continue to cut cost and pushed on prices of final products. In a span of 50 years prior to 1920s, when electricity, telephone, and internal combustion were being developed. the United States, spent about a half the time to be inverted. So, they yield on the short end of the yield curve is higher than the yield on the long end of the curves, typically indicated the economy is losing the steam. So, investors are less willing to invest in a long term, therefore indicating economic downturn in the future. Therefore, the inverted yield curves usually are tied to the economic recession, which is the most of the visions that were made in the past. However, not very true in the case of innovation platforms. This time around seem like deflationary pressure is also the dominating concerns rather than inflationary one, just in the past decade, we saw several times of inversion of the yield curve but no such recession followed. Such situations embolden the monetary authorities in the world to an aging unprecedented quantitative easing of monetary policies without suffering too much of the consequences, like in the past. However, in my opinion, the sudden reversal of the situation could mean severe consequences to the global economy.

The third observation I have is that with the emergence of innovation platforms, investments have become a source of a widening gap between the rich and the poor, unfortunately, rather than a force to narrow it. Ever since the late 1990s, after emergence of internet, the law of acceleration has worked in favor of those who have information and resources to access these investment opportunities. While millions of working people have neither of them, according to Economic Justice Fund, since 1979, the incomes of the top 1% of American earners have grown more than seven times faster than the incomes of the bottom 20%. This gap is a widening faster with the innovation platforms than before them. This has caused significant problems to American society and to many other societies as well, and led to more polarized public. As you all have seen what happened in America these days to understand these forces behind it.

Imagine a store on the corner of the main street of the downtown in a small city, the owners used to be able to make a decent living by working hard, learning a few managerial tricks to manage their shops well. But now Amazon and online shopping emerged and wiped them out, they lost their way of living. Perhaps they're in the middle age. And to get back to the workforce, they need to acquire skills. They had never tried to do when they were young. To think about these individual platforms, people with innovative and creative mentality are able to create new products, come up with new ideas, are likely to be rewarded handsomely, while others with little skills do so are an average salary.

My fourth observation is that in this process of technological leaps and bounces, the creation of wealth isn't necessarily shared by all nations in the world. While the US, China, and a few other developed countries enjoy the benefit of digital economy, other nations in Africa and Latin America are by and large shut out from it. Lack of manufacturing foundation is one reason, and shortage of human talents maybe the real key. Today, capitals are flowing into new innovation platforms, such as can computer chips, 5G, AI, new medicines faster than ever before. On the other head, what the poor countries really need is infrastructure, which has been under invested across the emerging countries for way too long.

My last observation is that the technical advance has changed the investment itself. Almost 20 years ago, on April 9th, 2009, when the Securities and Exchange commission of the United States ordered all US stock markets to switch to the decimal system or the fractional system in which prices were reported and quoted in fractions to be exact, in 1/16. Fractions was inherited from the Spanish system, which was adopted when the exchange came along at 600. As trader volume gets bigger and bigger, the fractional trading allowed too much price move, causing too much of losses. But moving to decimal trading eliminates profitability of many businesses on Wall Street.

At that time, technological demands made the market become a place where only strong players could survive. Brokers closed, firms shrank in size as commissions for the full service, trading decreased, from 5 to 6 cents to lessen one cent. So, the only firms managed to survive by relying on either non-equity trading revenue streams or other businesses, such as investment banking. Now, all the online platforms have eliminated trading commissions entirely starting from a year ago. High frequency trading is another significant change that happened to Wall Street. It’s a result of computerized trading about 10 years ago. High frequency trading allows institutions to gain a small and notable advantage in return to provide amounts of liquidity in the market. The millions of orders that can be placed by high frequency trading systems means those using them are lubricating the market, and in turn, they're able to increase profit under advantageous trades and obtain more favorable spreads. But after a decade of existence, high frequency trading has faded out due to increased competition, popular existence of the technique, and sometimes ethical implications.

Today, the quantitative strategies are also being widely used in investment and gaining popularity in China in particular. But whatever investment technique evolves, we have seen more institutions and individuals are placing bigger emphasis on the role of investment it plays in the society. The ESG (environmental, social, governance) now has emerged as the major shift. So, the investment or finance in general has raised more awareness of its role in causing the widening gap between the haves and have nots.

In my opinion, more than ever before, people are realizing that the investment plays a role in keeping the stability of society, maintaining fairness of distribution of wealth and income. I hope the listeners today and this online class will continue to follow the footsteps and make investment an integrated part of the future development of human society.