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Ed D'Agostino:

Welcome back to the Strategic Investment Conference. Since its founding in 2014, ARK Investment Management has been investing in disruptive technology companies and gathering assets at an impressive pace. Today, ARK's ETFs have over \$50 billion in assets. Cathie Wood, ARK's founder, CEO and CIO, joins us now for her second appearance at the SIC. Cathie, thanks for joining me. It's great to see you.

Catherine Wood:

Happy to be here at a really fun group. Great discussions.

Ed D'Agostino:

It's pretty interesting time right now, Cathie, to be hosting an investment conference with such a heavy focus on economics. There's a lot going on right now. Let's start with that. Let's start with some economics. I know you studied under Art Laffer.

Catherine Wood:

I did.

Ed D'Agostino:

I know you're very much in tune with the macro economic picture. How does today's macro backdrop, how does that affect you? I'm talking about the rising commodity prices, pressure on bonds, some concerns about interest rate hikes someday in the future. Does any of that impact your strategy?

Catherine Wood:

Well, our focus is exclusively on disruptive innovation. But because I do have a macro background, and because therefore we do have a point of view on the macro backdrop, I think ... Right now it's quite a differentiated view relative to the fears we're hearing out there. We are leaning into this aggressively, meaning we are concentrating our portfolios towards our highest conviction names. They tend to be very high multiple stocks. Evaluations are very high.

If the fear out there is inflation and rising interest rates, many assume that we will be hit hard, and we have been hit hard. From the peak, we're down somewhere in the 30% to 35% range, depending upon the fund. The P&S, the peak, in mid February, because there has been this rush to judgment about the environment we're in. Let me just step back and tell you how we look at what happened in the first quarter and moving into the second quarter, if that's okay.

Ed D'Agostino:

Of course.

Catherine Wood:

Think about the first quarter. The bond market had a heart attack. Then long term treasury yield, 10-year, went from 90 basis points at the beginning of the year to 175 basis points. A doubling. We have never seen that in a three-month period. Never seen a doubling in interest rates. Yet the equity markets on balance were up for the quarter. Right? And still are up. That was very interesting right there. The second thing that happened was [Arcogoss 00:02:52], and the fear that there was so much leverage in the financial services sector in particular that we were going to have a systemic issue problem that could have become a crisis.

We seem to get right through that. Then in April, we had President Biden outlining the kind of bills that he would like to say ... that he's going to propose. Among the ideas for raising revenue, of course, was a near doubling in the capital gains tax. Again, a killer for strategies like ours that have had very big appreciation. Going from 23.8 to 43.4, a lot of people are saying, "Well, it seems as though we never have a retro active tax bill like that when it comes to capital gains," but it could go effective upon legislation or next year. Let me not take any chances.

We have had that extra headwind, but equities have as well. I actually think the bull market has strengthened. It has broadened out here, rotated into value at the best sectors. Energy up more than 40% I think now. Financials, nearly 30%. Materials, 20%. Those are rough. This is not the kind of market that we will do well, and it reminds me of the fourth quarter of 2016. When President Trump was elected, there was a huge bounce in the market and it was toward value. Big rotation took place there.

I remember saying at the time and we were fledgling at the time, I remember saying, in answer to our board, "Hey, the bull market has just broadened out and my confidence in our strategy has just increased because a broader bull market, a strengthened bull market is a great launching pad," and 2017 was a great year for us. Just one more thing on interest rates and inflation, I think we're going into a deflationary period after this supply chain related and base effect related bounce in inflation, after we get through that. Today's inflation numbers, I'm sure to many people, were shocking.

Just looking through it, it seemed very much supply chain oriented. Car rental, transportation of [inaudible 00:05:36], and so forth. We think that the core CPI inflation will stay in the 3% to 4% range for the next few months, and PPI inflation headline could be anywhere from 6% to 10% on a year-over-year basis. But I think we've never seen such serious supply chain issues as we're seeing now. Think about it. A year ago, the economy effectively just shut down. During '08, '09, it was shutting down. It was a slow move into that cathartic moment.

This was just cold turkey. Businesses cut off all orders, and what happened was the consumer saving rate soared to 34% 35% and the consumer had very few places to spend. Goods. Goods were the space is to spend, right? Durables and non durables, especially for the home and so forth. Well, that's where they spent a disproportionate amount of their budget relative to normal. Goods are only one third of consumption in the GDP accounts. Services are two thirds. What I think is going to happen now is businesses are scrambling like crazy to keep up with demand. They can't. They got way behind.

They're probably double and triple and quadruple ordering. That's the first thing. The consumer, yes, has been spending aggressively on goods, but probably is about to shift the mix back towards services, maybe disproportionately. I think we're going to end up with a massive inventory problem towards the end of this year or into next year. We see three sources of deflation on the horizon. The first is that one, and that's inventory-driven and very commodities-oriented. The second is what we call good deflation. Good deflation is associated with technologically-enabled innovation.

I'm not sure if we talked about Wright's Law last time. Wright's Law is really important to us. It says for every cumulative doubling in the number of units produced, costs associated with technologically-enabled innovation decline at a consistent percentage rate. In DNA sequencing, I probably did share that with you this last year. 40% for [inaudible 00:08:12] Batteries, 28%. Huge

deflationary forces that are going to increase access as prices come down, and unit growth therefore will explode in those areas.

The bad deflation is the corollary to that, and that is, we believe as much as 50% of the companies in the S&P 500 are going to be disintermediated or disrupted by the five innovation platforms around which we have centered our research, DNA sequencing, robotics, energy storage, artificial intelligence, and blockchain technology. They are in harm's way, and they probably, because they are more mature, since the tech and telecom bust and the '08, '09 meltdown, they have basically complied with short term oriented investor demands. They wanted profits, they want them now. They wanted dividends, they want them now. To do so, they leveraged up.

Now many of them are going to be in harm's way. In order to service debt, they'll have to cut prices. We see major deflationary forces evolving here. I know on a day where the CPI has gone up 0.8 and then 0.9 in core, many people might be looking at this and wondering. But this is what we do all day long. We know the good deflationary forces are in place, we know the bad deflationary forces are in place, and now we believe, given what we're seeing with inventories, double, triple ordering, that there's another deflationary bias that's being built into the system, but probably won't play out until later this year next year.

Ed D'Agostino:

Wrong to your credit. I went back and reviewed the interview that you did last year with Barry Ritholtz at this conference. You said that the savings rate increasing by the US consumer was going to turbocharge demand. But you still maintain today, I just want to make 100% sure, you maintain that still disinflation is going to win over inflation, based on what you're seeing today still.

Catherine Wood:

Yes. Yes. Very much [inaudible 00:10:30]

Ed D'Agostino:

Your strategy focuses on technologies that just by nature enhance productivity. We've heard all kinds of stories about the pandemic pulling trends forward by years. What about this period that we're in now? I don't know if we can call it yet the post-pandemic period, but hopefully we're at least close to that. We're hearing stories about businesses that can't fill open positions. We're hearing about wage pressure. How do you see your companies, the companies that you invest in, filling this void?

Catherine Wood:

Yes. Innovation solves problems. When I was with you the last time, I probably said it, and certainly to Barry. That was our calling card. During the coronavirus, I did a YouTube video every Friday at that time saying, "Innovation solves problems. Here are the companies that are solving these problems that we have now." Well, you're talking about now the opposite set of problems. Innovation still solves problems, in terms of inability to find workers. We got a report this week that said that the job openings have hit a record 8.1 million jobs. Now 7.4, 7.5 million people are still unemployed, who were employed before the pandemic.

But there's probably a mismatch in terms of skill set. Some of the job openings are associated with very low price jobs, or the jobs that don't pay very much. And many of those people, they are facing a number of issues or there's a bit of competition. Certainly they're getting checks until September for not working. If they do work, then they will lose those checks. There's an incentive there, and some of them, of course, have children at home. The schools haven't completely opened up, and so

there are child childcare issues. I think with innovation, we're going to see a lot more automation, both physically with robotics, collaborative robots, especially.

Effectively, assembly line workers will train these robots by simply showing the arm of the robot how to pick and place, pick and place, and so forth. We're sure Amazon's starting to do a lot of that already. But other jobs are going to be displaced increasingly by artificial intelligence. Again, they're the more repetitive jobs in the knowledge worker space. I think this is another opportunity for innovation to solve problems. We think that robotics is going to take off, and automation generally. We're fascinated by a company that just went public, UiPath, the Tircas PATH, P-A-T-H, which is all about workflow automation.

What this company has done, interestingly, is developed a platform where knowledge workers and managers can compare notes about the best way to improve workflows, and it's taking off like wildfire. This has become viral. It feels because they opened up their platform, much like we've opened up our research, we've grown a lot faster because we've opened up. They have grown a lot faster than I think anyone could have imagined because of the struggles that managers are having retaining talent in their knowledge worker space. What was interesting to me is these managers do not consider workflow processes to be part of their IP, and so they're sharing.

This is almost an open source ecosystem. That company is mushrooming. It's clear everyone's scrambling to solve the same problems, and now they're comparing notes. I think we're going to see a lot more platforms like that. Palantir report this week as well. Artificial intelligence pushing it to the edge, becoming the operating system around which artificial intelligence takes place. Very big idea. Companies understand where the pain points are out there, and they're becoming platform strategies to help solve these very widespread problems.

Ed D'Agostino:

Sticking with the economic angle just for a little bit longer.

Catherine Wood:

[inaudible 00:15:31]

Ed D'Agostino:

Do you think that we're going to see an increasing percentage of eligible workers not working? The question that I have really is can we fill all the open positions that we have? If we were at 1% unemployment, would this country still have a huge number of open job positions? I think it would.

Catherine Wood:

Yes. We believe that is true. We think we're going back into a labor shortage, broadly defined. Not having to do with a pandemic, but a labor shortage, given demographics and growth in the economy. I think what we're going to see is the productivity that we're talking about, which is another way of expressing what I did with Wright's Law, is going to accelerate. It already has started to accelerate. I think, on a year-over-year basis, it was 4.2% in the first quarter, and at an annualized rate of change, it was 5.2%. We're already seeing that. That's a powerful antidote to any inflationary pressures that are evolving out there.

Yes, we think productivity is going to skyrocket. We did an analysis, just to give you a sense of how much technology-enabled platforms, how many jobs they can create. That was answering the robotics question. We did a study based on University of Oxford. Oxford University study, which when

we started the firm had just been published. It was about the United States and the labor force. Basically, the headline read, "47% of all the jobs in the United States are going to be lost to automation, including artificial intelligence, during the next 20 years." We took the same study.

They left it there, and that's why the robots are going to kill jobs worries, really developed some momentum. We took the same study with a 700 job classifications they used, and given our cost curve declines figured out when these various job categories would submit to robotics or automation, generally, and we came up with ... Yes, that's true, there's going to be the displacement, quite a bit of it. We need to re-educate, we need to retrain. But at the end of the day, [crosstalk 00:18:09] in 2035, we believe that because of automation, GDP in the United States will not be 28 trillion, which was the linear expectation, but it will be 40 trillion.

Our job as an investor in innovation, focused only on innovation, is to find out where that \$12 trillion is going to be. It's going to be in jobs that we cannot even imagine now. In the early '90s, we could not imagine the gig economy, Uber, Lyft, Airbnb. Wouldn't have happened without the internet, and that's going to move into overdrive during the next 15, 20 years.

Ed D'Agostino:

Well, and even displacement. I think it's an oversold idea. Last year, you brought up this concept of ... I want to make sure I get it right. I think it was automated trucking platoons, I think is what you said, that [crosstalk 00:19:14] this automated fleets of trucks would be taking freight from one side of the country to the other with no driver, and I stop and think, what driver is going to be displaced by that? We could train thousands and thousands of new truck drivers and we still don't have enough. There's a chronic, chronic shortage. I think the displacement argument is pretty oversold at this point.

Catherine Wood:

Yes. There's another factor I think that puts an exclamation point on what you're saying. Automation is going to turn unpaid jobs. Think going to the grocery store every week or every day, preparing food every day, cleaning up afterwards, maybe we'll still have to do that. But if a drone's bringing food to our home and is prepared already, that is displacing unpaid workers. Right? That is a lot of the history of automation. Most farm workers were unpaid. They were the children, and there were many of them, right? In these big families who needed more children to do the work, they were not paid, at least when they were very young. This has been the history of automation, and it will continue.

Ed D'Agostino:

Let's dig a little deeper and get into some of the fun stuff that you do. You talk about looking for stranded assets as being targets for disruption. What do you mean by that term stranded assets, and how does that play into your strategy?

Catherine Wood:

Well, we think that a lot of value investors pay a lot of attention to book value in their analysis. But given what we do, we think we can identify and actually pair nicely with value. We can identify what assets on the book are going to become pretty useless. Just think about retail stores, think about bank branches, think about traditional railroads. Just go back to autonomous trucks, autonomous truck platoons, we believe that taking the human driver out of trucking is going to make trucking more cost effective than rail. Let's put numbers around that, right?

Now, roughly, this is very roughly, to transport freight by rail costs about four cents per ton mile. To transport freight by truck, human-driven truck, costs 12 cents per mile, but you get a little more

convenience point to point. With autonomous truck platoons, that cost will drop below rail, we believe, to three cents per ton mile. Even value investors who look at rails as impervious to disruption are going to wake up to more stranded assets than they might have appreciated. That's what we mean by stranded assets. Don't be so sure the assets on the book are a good source of value.

Ed D'Agostino:

Okay. Let's dig into some of the areas that you focus on for investing. I'm really curious to know what the future looks like in Cathie Wood's mind, five to 10 years from now say, because of the companies that you invest in. All the companies you invest in have a story. But what happens when you put them all together? Well, starting with healthcare and biotech, what would you think five to 10 years from now looks like in terms of healthcare?

Catherine Wood:

Well, first, I'll step back and do it from an entire portfolio view, and then I'll zero in on health [crosstalk 00:23:24]

Ed D'Agostino:

Okay, perfect.

Catherine Wood:

What we believe is going to happen here is that S-curves are going to be feeding one another as technologies converge. Just let's use the autonomous ... We'll use autonomous taxi network or autonomous truck platoon. Three of the five major platforms, which involve 14 different technologies, but three of the five major platforms are going to converge to make that happen. Robotics, autonomous vehicles are robots. Energy storage, they will be electric. Electric is becoming much more cost effective than gas-powered, and much more environmentally preferred, and artificial intelligence.

Three major platforms, all of which are going through their own S-curves, are going to feed into this autonomous taxi network idea, or autonomous platoon idea. We believe the growth is going to be explosive. At a brainstorm, I was trying to explain how can we describe what's about to happen here? Because most people don't understand if they're not doing research the way we are, or nor are they doing the kind of research we're doing. Someone on the brainstorm said, "Okay, I'm ..." Because I was saying multiplicative, combinatorial, how do we bring this to life? This person said, "Well, I'm not sure, but it sounds like the ocean. When the waves are crashing into each other, some ships are boosted and some ships sink, but the energy is explosive."

I think that's right. There's going to be a lot of confusion, and if you're on the right side of change, the opportunities are going to be enormous. These are exponential growth trajectories that are feeding one another. Into healthcare. Healthcare, three technologies. DNA sequencing, which is also a platform technology, artificial intelligence, and gene editing and other gene therapies. What we believe is that we're going to be able to understand what diseases are evolving in our genomes. This is in five years, because by that time, the cost to sequence a whole human genome, it probably will be down below \$100, the way we see the competitive environment evolving here and-

Ed D'Agostino:

Will that be a part of your checkup? A part of your annual physical will be mapping of your genome?

Catherine Wood:

Yes, we do believe that will be the case because that way, we will be ... As we age, our genomes mutate. Mutations are the earliest manifestation of disease. We've not been able to identify disease in its early state. Now we will be able to, and in fact, when you think ... Stage one cancer, think that. But even more interesting, with time, and I don't know if this is in five years, artificial intelligence will be able to tell when a body is getting ... our genome is getting set up to mutate even before it does.

It's a little bit like over-the-air software updates now, for Tesla cars. My Tesla car has never gone in the shop. I've had it since 2018 because they diagnose problems ahead of time and fix them. I think that we will be moving toward that kind of environment in healthcare, and I think that's why telemedicine is going to become such a big force in the healthcare industry. Much bigger than people now anticipate. I think there'll be cures for disease because of gene editing. We've seen beta thalassemia and sickle cell disease cures.

CRISPR Therapeutics is aiming for diabetes, which if they hit that, diabetes is the source of the biggest category of healthcare spending because it's associated with so many other illnesses, right? They're thinking big, and I think the science is going to work. I think early, early days suggests is going to work. Even Jennifer Doudna, one of the co-inventors of gene editing, CRISPR-Cas9 specifically, is saying that her concerns about the safety associated with gene editing are diminishing, and therefore, her optimism about the future of gene editing is increasing.

Ed D'Agostino:

How about the same question for energy? We know you're an early investor in Tesla, but Tesla is not just a car company. It's becoming an energy storage company. They've elevated everyone's awareness of batteries. How do humans interact with and consume energy in five to 10 years?

Catherine Wood:

Well, okay, first on Tesla, yes, it's an energy storage company. It's a robotics company, autonomous vehicles. It is an artificial intelligence company. It has designed its own chip, just like Apple did, and that's why Apple took over the smartphone market and has taken most of the profitability in that market. It is a software as a service. Remember over-the-air software update?

Ed D'Agostino:

Sure.

Catherine Wood:

It is the quintessential convergence company out there, technology convergence company. In terms of energy specifically, well, first of all, we do believe that energy demand during the next 10 years will drop, this is globally, because of electric and autonomous vehicles, anywhere from 25% to 35%. Now, when you're talking about a commodities market and that big of a drop, you're talking about prices, which are determined at the margin, that will probably drop back to where they were before or maybe right after the oil embargo in the '70s. That would be \$10-ish.

Ed D'Agostino:

Wow.

Catherine Wood:

Nobody really believes that right now, but I do. Though, as we're doing more and more research, the probability of that happening does seem to be increasing. In terms of energy storage, well, Tesla just did something very interesting with its ecosystem. It's an energy storage ecosystem. It will not sell a solar roof. I'm building two houses now, and I'm going to put solar roofs on both. But unlike the case before this week, I will have to then also buy the energy storage units for the house, as well.

Ed D'Agostino:

The Powerwalls.

Catherine Wood:

The Powerwalls. We're probably moving into an ecosystem where I will be throwing off some of that to the grid when the sun is shining very, very brightly for long periods of the day. I think that it's going to ... We're going to become a much more distributed grid architecture. We have no choice. We will not be building peaker plants anymore. Peaker plants have been built regularly just to service five, maybe 10% of the days when it's hot all over the country or cold all over the country. I do think we'll go to a more distributed architecture with the help of homes and roofs and Powerwalls. Maybe we'll be earning a little money, I don't know how much, selling to the grid. But the grid will become more robust and secure because of this, we believe.

Ed D'Agostino:

Now let's turn to finance. Similar question to finance. We hear or we've been hearing for the last couple of years, few years, about the amazing potential of blockchain. But it's still pretty vague in terms of application that the everyday person can see. We'd love to get your thoughts on how do you see blockchain, if you see blockchain revolutionizing finance and investing, ownership of assets, that sort of thing.

Catherine Wood:

We do. We think our go-to crypto asset is Bitcoin. It is the reserve currency of the ecosystem, the entire crypto ecosystem, which is up to I think 9,000 different crypto assets now. There will be only a few currencies, we think, supporting ... who will grab the lion's share of the network value out there. Bitcoin is one of them. Ether is one, certainly associated with the DeFi space and now the NFT space, Non-Fungible Tokens. We're looking for the other ones that are going to be the currencies of this ecosystem, because that's one of the biggest plays if you believe in the fat protocol thesis.

This is Joel Monegro's thesis. He was at Union Square Ventures. Now at Placeholder Venture Capital. That thesis says, contrary to the internet. If you think about the internet, we've grown up and learn to understand technology through the lens of the internet. We're probably going to have to flip that model on its head to understand blockchain. But the internet, if you looked at the protocols or the standards that the internet is running on now, no one makes any money off of those. It was the applications on top of those protocols, Amazon, Facebook, Google, that became Grand Slams.

We think the Grand Slams of the crypto world are the currencies, which are a manifestation of the most secure protocols out there, most secure and therefore most used protocols. Most secure is Bitcoin, bitcoin's blockchain. Many people complain and say, "Well, transferring value, as you say, it's too slow. It's too expensive." Maybe if you compare it to Ethereum, but not if you compare it to the traditional banking system. If you want to transfer \$10 million, right?

Ed D'Agostino:



Right.

Catherine Wood:

In the traditional financial world, there'll be a lot of paperwork, a lot of checks and balances, and it can take a week or two, right? It takes 10 minutes on bitcoins blockchain, and this is the most secure network. If you're going to transfer 10 million, you probably want to do it on Bitcoin, not on Ether, which is not as secure. Right? Also, in terms of expense. I don't know what the numbers are today, but let's say 10 to \$100, somewhere in that range. For that transfer of \$10 million, it would cost a lot more in the traditional. Now, if you compare blockchains to one another, Ether is where ...

I think the number of developers on Ether now it's swapping that for Bitcoin, because there are more use cases around the idea of smart contracts, and DeFi, decentralized finance. I think your listeners, unless they're involved in this world, would be very surprised at how much activity there is in terms of lending and saving on the DeFi platforms right now, and they'd also be surprised at the kind of interest rates that you can earn. You can earn, let's say, 5% to 8%, depending upon maturity and so forth, in the DeFi space. You can't earn anything like that certainly with deposits in the banking system.

We think this is pushing people towards this ecosystem, particularly the millennials. They're very agile, when it comes to technology. They're very interested, they want to learn all about it. On top of that, in the Ethereum system, we have ... Really, it's the support for Non-Fungible Tokens, and we can get into that maybe another time, but these two use cases right now are driving Ethereum. Now Ethereum has started outpacing Bitcoin in terms of price appreciation, just because there's so many use cases right now.

Ed D'Agostino:

Do you see a day, though, where a major component of the financial system is disrupted, like the stock market? The way we buy and sell stocks, will that be changed or is there just too much regulation and entrenched interests to keep that from happening?

Catherine Wood:

It is already happening. Our ETF, ARKG ... Now, I'm not going to remember what they call this synthetic instrument in the DeFi world, but it is mimicking ARKG. We don't get anything from that, of course. We don't get anything. That means it's displacing us. It's probably much less expensive, and there are other attributes. It's all within the ecosystem where these millennials like to do their financial business. I think that kind of activity will proliferate. I also think what will happen is that digital wallets ... Again, this is another. Unless we are integrated into digital wallets, and I mean ARK's products or anyone's financial products, we're probably going to be on the losing end of history.

Ed D'Agostino:

[crosstalk 00:38:17]

Catherine Wood:

We are definitely looking at how quickly digital wallets like Cash App and Venmo are evolving. WeChat Pay and Alipay showed the way, but now the traditional world is very interested in this way of doing business, just a bank branch in our pocket or pocket book. One stop shopping. I think it will be very important for any financial services company with interesting products, interesting to the millennials in particular, to insinuate themselves with some of these digital wallets.

Ed D'Agostino:

We're starting to get a lot of questions coming in for you. A lot of them are asking for more specificity in what you're interested in. I'll ask you my last question, which touches on that, and then I'll move to audience questions. My last question for you is everyone asks you about Tesla, everyone asks you about Nvidia or your largest holdings. I want to know what your smallest holdings are. I'm really interested to know what are the technologies or companies, if you can disclose them, that just made it under the door and are acceptable for investment by one of your ARK funds?

Catherine Wood:

Well, we publish our trades every day and our position sizes. What has happened during this risk off period is we've gotten the opportunity to buy stocks which were, even from our point of view, we thought their valuations were extremely rich, but we were very interested in the technologies. I mentioned one UiPath, which again is about work flow automation, a platform where knowledge worker management teams can compare notes about workflows, what's working, what's not working. That's gone viral.

That has become a bigger position in the portfolio. Was a small position, it's becoming a bigger position because we've had the sell-off, and therefore, the opportunity to build it. Two other ones that we have built here that were small positions and are now growing. Because I always like to see, okay, especially for high valuation stocks, which are platform strategy. I understand why they have valuation because they're probably going to be much bigger than most investors or analysts now anticipate. I like to see how they're tested in a downturn, and I'd much prefer to buy.

Two other ones where we have done just that are Palantir and ... I know there's a lot of chatter on Twitter about our purchase at Palantir. We have sizable portfolios now. Palantir was not a big part of our portfolios, but now it's becoming a much bigger part. This is artificial intelligence at the edge, trying to become the operating system of the physical and digital world as those two worlds converge, right? We're very interested in Palantir. Palantir's heritage is government, defense, national security.

Palantir, we believe, is working on technologies, importantly including artificial intelligence, that we cannot even fathom right now. But the defense has been supporting because there are some enormous breakthroughs. I think Palantir understand much more about how the world is going to work than any of us do, even those of us who spend all our time researching innovation. Then the third one is Unity. It's a gaming platform. It's really the ... Let's see. What's the right way to ... It's really about bringing to life virtual worlds and the metaverse. This, again, is where the physical and the digital world will converge.

Their technology is being used by every gaming platform, like Xbox, and even by AAA gaming companies, like Epic and Fortnite. I just found that out yesterday or the day before on their earnings call. That's huge. It's becoming the interoperability platform for gaming, and it is moving into other verticals that will benefit from artificial and virtual reality, including construction and energy. Probably every sector.

Ed D'Agostino:

Wow.

Catherine Wood:

It set itself up from an interoperability. You can see each of these companies is a platform company, and they've set them up ... They're either way ahead of the game in terms of artificial intelligence, or they

have set themselves up from an interoperability point of view. Now, another one I'll name and this is one of the bigger ones is Teladoc, from an interoperability point of view, insurance companies, hospitals, patients, doctors. Athenahealth fought the good fight and then was plucked by Elliott Management, and probably destroyed, I would imagine. I'm not [inaudible 00:44:01] because-

Ed D'Agostino:

[crosstalk 00:44:03]

Catherine Wood:

What you need to do in innovation ... I'm not saying everything they touch turns to mud or anything. But when you're moving into the innovation space, you're thinking about maybe how to streamline costs, make the costs more effective in terms of output. But more important, you need to invest aggressively in R&D to capitalize on the exponential growth trajectory. Teladoc would be another interoperability play in one of the largest sectors in the economy, health care, which is nearly 20% of the economy.

Ed D'Agostino:

Let's get into a couple audience questions, if we can.

Catherine Wood:

Sure.

Ed D'Agostino:

First question, do you see the current market analogous to dot-com boom and bust, where great companies were created but prices got far ahead compromising investor returns?

Catherine Wood:

Well, the seeds for what are happening now or what is happening now were planted back then in the 1990 to 2000 range. Too much capital chase, too few opportunities, the technologies weren't ready, and the costs were too high. DNA sequencing, it took \$2.3 billion to sequence the first whole human genome back then, and 13 years of computing power. We were ready for primetime. I just gave you some numbers on DNA sequencing, we're ready for primetime. We have had a 20 to 25 year gestation period for these technologies, so that the technologies are now ready and the costs are low enough for these exponential growth trajectories to take off.

The seeds were planted back then, too much capital, too few opportunities, was going to end badly. I think today is the opposite of that. I think that investors will be astounded at what this gestation period of 20 to 25 years will deliver. I touched on it when I talked about one S-curve feeding another, feeding another, and getting some explosive results. On the other side of that is creative destruction. You have to be on the right side of change, otherwise, it will feel a lot like the tech and telecom bust, but not because of tech and telecom.

Ed D'Agostino:

Are you looking into alternative energy storage technologies other than batteries, such as compressed air, hydrogen, other technologies that maybe we haven't heard as much about?

Catherine Wood:

Sure. Well, Nikola, as we were doing our work on Nikola hydrogen fuel for trucks, we learned very quickly that the build out of that infrastructure and the operating costs of the truck were going to be prohibitive relative to even gas-powered, but electric as well. Yes, we've done our work there. We actually started doing that. Toyota introduced its first hydrogen-fueled car. It still exists, I've forgotten the name. But we determined for cars that it would be uneconomic for both of those reasons going forward, and I think we're being proven right.

Compressed air. I know that Sam Korus, who does our battery work and energy storage generally, has been looking at that, as well as solid state batteries. We think that's a very tough problem to solve. QuantumScape is showing us that that's true. It's not unsolvable. Our reaction to energy storage ideas, new companies, is that Tesla probably will see all of them. Because any company worth its salt will want to have a partner to help scale the technology and bold enough to make it happen. We do talk with Tesla regularly about these sorts of things, and I think they're wedded to the current technology, at least for now.

Ed D'Agostino:

How about your structure? Your funds are ETFs. You have a massive amount of AUM, at this point, right? Is there a point where you consider offering a different type of structure to pursue some of your strategies because you've got too much money to put at work?

Catherine Wood:

Well, this is a capacity question. We do have other wrappers. In fact, we're somewhere in the 70 to \$80 billion. We have reserve advice for mutual funds in Japan, reserve advice in the US for our distribution partners mutual fund, our disruptive innovation strategy. We do have other wrappers. We have separately managed accounts. The capacity question, if we are right and these exponential growth technologies are going to scale exponentially, if we're right, then our capacity should scale exponentially. What we're also seeing today is a plethora of secondaries, IPOs, specs. Most of them are about innovation.

Ed D'Agostino:

Sure.

Catherine Wood:

I think many more companies understand they need to fund themselves aggressively now if they want to win at the end of the day, and the reason for that is thanks to artificial intelligence. The companies with the biggest pools of data, and they can be internal and external, and the highest quality data are probably going to be in the pole positions to win in their respective spaces, and that's why we think Tesla is going to win in the autonomous taxi network space.

Ed D'Agostino:

Cathie, what I wish we could go for another hour. It's always such a fascinating pleasure to speak with you. Thank you so much for your time. I know you have a board meeting, so I promised that [crosstalk 00:50:20] I would not keep you late.

Catherine Wood:

Yes. Thank you so much, Ed. You always do your homework and ask great questions, and I know your audience is spectacular. Thank you so much, and please thank John as well.

Ed D'Agostino:

Will do.