

# CIO Roundtable: Lessons from the Late 1990s Bubble and the Road Ahead

## TRANSCRIPT

**Host:** Sid Ahl, CFA, Chief Investment Officer, Private Client, Endowments & Foundations

**Guests:** Erika Pagel, Chief Investment Officer, Sustainable Investing

Paul Chew, CFA, Chief Investment Officer

**Sid Ahl (00:01):**

Hello, and welcome to Brown Advisory's Investment Roundtable, where we invite some of the leading investors from inside and outside the firm to discuss issues of the day. I'm Sid Ahl, the Chief Investment Officer of our private client endowments and foundation practice. And for our first conversation, I'll be joined by Paul Chew and Erika Pagel. Paul is the CIO of Brown Advisory. He's one of our most tenured investors, the architect of our equity research team and helpful for today, our firm's first technology analyst. I'll also be joined by Erika Pagel, the CIO of sustainability at Brown Advisory, who has her roots in equity research covering consumer companies. So let's dive in. Paul and Erika, welcome.

**Erika Pagel (00:40):**

Thanks, Sid. Good to be here.

**Paul Chew (00:41):**

Thanks, Sid. Great to join you.

**Sid Ahl (00:43):**

To kick off today's discussion, I'll give a brief overview of the big picture we see in markets. It's incredible to think how far we've come in the past year. This time last year, most of the world was in lockdown and economic and health uncertainty had rarely been higher. Thanks to enormous fiscal and monetary stimulus and the creation of a 90% plus effective vaccine in just nine months, we're in the early stages of a powerful economic recovery, and investors are responding with enthusiasm.

After closing last year up 16%, global stocks are up another 5% this year. What matters now is where we go from here. Some of the things that we're excited about are the pace of innovation, historic government support, and a strong outlook for growth. We are at a time of great innovation in technology and healthcare, a golden age of disruptive innovation, which was accelerated in many ways by the COVID crisis and the work from home environment.

And we now appear to have a cyclical recovery to boot. In the U.S., after approving a 1.9 trillion stimulus package this year, there are discussions of another 2 trillion infrastructure spending plan that's in the works. U.S. fiscal stimulus from the pandemic may end up being four times as large as

what we saw during the financial crisis. With that, economists are projecting nearly 6% GDP growth in the U.S. for 2021. And some think it could be as high as 8%. That would be a rate not seen since the 1950s. S&P 500 earnings are projected to increase 30% this year, and growth is even higher outside the U.S. We're expecting nearly 40% in emerging markets.

As for concerns, we're focused mainly on the direction of inflation and interest rates, and some signs of speculation in the market. Markets have a lot riding on low rates. They've stretched valuations everywhere, particularly in hyper-growth stocks and heightened growth expectations have inflation and interest rates on the rise. For a sign of how widespread the enthusiasm is, take a look at the retail investor. Retail trading volumes were up over 400% last year. And the buying of call options by retail investors are at 20 times historical levels. SPACs, or special purpose acquisition companies, have raised more money in the first quarter of this year than they raised all of last year. And last year itself was a record. The Gamestop saga and recent liquidation of a large leveraged family office Archegos are powerful reminders of the risks when animal spirits are high.

So with that, let me bring Paul and Erika into the conversation. Paul, I ended with some of what we've called the echoes of 1999. You were the tech analyst for Brown Advisory during that period. What similarities or differences do you see in today's session?

**Paul Chew (03:21):**

That's a great question, Sid. I sit and think back to when I was the tech analyst at Brown and things came apart during the tech bubble blowing up and thought to myself, I'm never going to have that feeling again that I did for roughly six to nine months, starting in the summer of 1999 through March at that point in time, and lo and behold, starting in November, I started having some of those same feelings. You would come in, stocks were going up by 10%, 15% on absolutely no news. And I sit, think back about what's similar today to what was going on back then? And what's important to remember, and for those that are either too young to remember, or too old to remember, it was very similar in the fact that we were right at the precipice of the development of the internet at that point in time. And the opportunity set that we could all envision was enormous.

Now, none of us probably got the absolute magnitude correct. It ended up being so much greater and so much more impactful on all of our lives, but it was that optimism that allowed us to really think forward to how great things could be. And we have a lot of those same things happening today, right? Whether it's in the biotech industry. And you mentioned the mRNA technology that is capable today because of the gene sequencing that has come around, or we think about the potential of vehicles and autonomous vehicles and what they mean to society and the world. So a lot, cloud computing, there's a lot of great technological change that's happening right now, which I think is allowing investors to be incredibly optimistic when they think about that.

Now, some of the things that ended up being bad about what happened and why the tech bubble ended up imploding at some point in time is the pure speculation that, that optimism really started to bring into the conversation. And retail investors are as involved in the market today, just like they were back in the late '90s. I can remember going out to visit companies in San Francisco. And the cab driver was giving me his best stock picks as he was taking me to the hotel from the airport. Today, it's Robinhood instead of the cab driver. You've seen IPOs going crazy. I remember watching one of the first memorable events for me was really when Netscape came public and how that

traded on its very first day. And we've seen a lot of those similar types of whether it's Airbnb or DoorDash in the last couple of times. So it really has had the same echo in my mind, as I think about what's going on today.

**Sid Ahl (06:25):**

Erika, you were covering consumer companies back in that period of time. What do you see as similarities and differences?

**Erika Pagel (06:33):**

Great, thanks Sid. Well, I have a lot of fond and informative memories from the late 1990s, which was very early in my career. Consumer companies, which many of you may not remember, they were innovation leaders for decades, companies like Procter and Gamble, Colgate-Palmolive, Pepsi. They were really marketing behemoths. And in 1990, consumer staples represented 14% of the S&P 500.

It was actually the largest weighting across all sectors. In 1990, technology represented 6%. By 1999, both of those industries had flipped. Consumer staples was now 7% of the S&P and technology was 29%. It was a period of time when consumer staples focused on globalization. Companies had the opportunity to grow in regions that didn't have their products. They were able to gain market share. They had first mover advantage.

In many ways, these companies had to be both big and small all at the same time. And they were building scale in every part of the valuation and every part of the value chain, research and development, distribution, procurement. As Paul mentioned, the 1990s in many ways was just at the onset of the adoption of the digital age. And we were not yet digital consumers at that point. And so in consumer staples, we had the benefit of products didn't suffer too much from obsolescence, just as long as they were able to innovate and maintain consumer attention. It was really the art of the new and improved. However, towards the end of the '90s, despite relentless innovation by a lot of these companies, efforts around globalization, several companies were kicked back in the late '90s with the rolling emerging market crisis and currency devaluations, and consumer was out of favor. So I guess my experience was a little different than Paul's, but there's a lot of similarities today.

We are seeing currency impact in regions of the world. Consumer staples has been out of favor driven by investor interest in tech. Consumer stocks, they had great performance in the 1980s, but performed in line with the market in the 1990s, up until the tech bubble. However, when the tech bubble burst, investors all of a sudden wanted to own Pepsi and Procter and Gamble. So there's certainly similarities today. Oddly enough, consumer staples still represents 7% of the S&P 500, but we'll see what happens over the next year. We'll see how long the tech rally lasts. Will we have sector rotation, like we saw in the '90s and early 2000s?

**Sid Ahl (09:31):**

How much do bubbles matter? Can we invest portfolios today and just avoid these pockets of overvaluation and make shifts within our portfolios and be okay? Or do you worry about the systemic risks that some of these building levels of excess are bringing?

**Paul Chew (09:53):**

Yeah. Sid, I think about that a little bit from, I've unfortunately had to live through two bubbles that have bursting from a market perspective and they were very different in what the collateral damage that was caused from those. The first being the tech bubble, which was an inflation of asset prices in an area that had enormous promise, but got significantly overpriced into the securities. That created a risk specific for those businesses that as Erika mentioned, didn't really take itself into other stocks. And so you could successfully invest coming into 2000, 2001, as long as you just didn't have tech media and telecom in your portfolio, you were able to produce positive returns, small cap value from 12/31 of 1999 for the next five years, never touched below zero and had 125% return over that period of time.

You compare and contrast that to what happened during the financial crisis, which was very different in the way that that market kind of imploded. There was nowhere to hide in that market, because that was a liquidity driven event. You had subprime mortgages creating a vacuum of liquidity across the entire investment landscape. So that one we had absolutely nowhere to hide and everything went down with that. If I think about today versus then, I think we're in a period much more similar to the tech bubble, where you have certain asset prices that are great businesses. Reality starts to set in to that business at some point in time. And then I compare and contrast that to other areas within the market today. And I think there's a lot of places where good businesses you mentioned were coming out of kind of an economic downturn from-

As you mentioned, we're coming out of an economic downturn from the pandemic. There's a lot of businesses that are poised to really have positive earnings momentum coming out of this, which aren't trading at enormous multiple. I feel very much like we're in an environment similar to when the tech bubble kind of came down, probably not to the same degree that the tech bubble came down but I think there is still plenty of places to invest within the market today.

**Sid Ahl (12:30):**

It's interesting. I know we've talked a lot about within technology within growth there's a really big disparity. Right? We talked about Snowflake or some of the other softwares the service companies trading at 20, 30, 50, 100 times revenues. It's very different than what we've seen in the last six or nine months from the FANGs, which were all the story coming out of the depths of COVID and they've really led the market out, but many of them haven't really moved much. We were talking about this the other day, Microsoft. The multiple on Microsoft is the same today as it was entering the pandemic, so it really hasn't seen a re-rating in the same way that some of these hyper-growth companies have.

**Paul Chew (13:14):**

To put Microsoft's multiple in perspective, Microsoft's PE multiple is half the price to sales multiple of something like Snowflake, just to give you an idea of how different those two areas are from a valuation perspective. I think there is places where it is very similar to 99, but there's a lot of places where it's not similar. I think the big cap tech stocks, if you go back to 1999 and you think about the four horsemen; the Intels, the Microsoft's, the Dell of the world, those businesses were trading, and Cisco was the fourth one, were trading at multiples that just were not investible at that point in time.

Microsoft, it took 17 and a half years for it to regain the peak that it set in early 2000. Microsoft, they had a CEO there for a little while and Steve Ballmer that didn't do a great job, but for the most part, that business, up until some of the new businesses we created, probably was the single greatest business that's ever been created. They were turning 50 cents of every dollar of revenue into cash. That's an amazing business, and they didn't miss a whole lot of... They grew throughout that 17 and a half years. It just took a long time to regain that multiple that you paid for it.

**Sid Ahl (14:40):**

We've talked a little bit about these emerging hypergrowth technology companies that are maybe overvalued in pockets of almost bubble-like territory. Erica, you and I have talked a little bit about some of the other bubbles related to EV and alternative energy. What are you seeing in that space?

**Erika Pagel (15:01):**

Yeah, there has been an increase in renewable energy development over the past decade, but what's particularly interesting is that that has not been paralleled in renewable stock performance up until recently. If you look at clean energy on the broad market, it actually underperformed from 2011 to 2018 and then began to pick up again in 2019. Last year, frankly, clean energy was a runaway performer. If you look at the WilderHill Clean Energy Index, it was up more than 200% last year.

I think investors are gravitating to renewable energy for a lot of reasons. Certainly advances in technology. There's better economics, right? We are close to price parity on a lot of these areas. Solar is one of them that is now cost competitive. There is an allure of finding the next Tesla. That draw is attracting a lot of investors and then certainly green stimulus plans not only in Asia and Europe, but in the US with the current administration.

What's important to recognize is that much of the performance over the past year has been driven by the large number of IPOs. When I mention IPOs, much of that falls into the category of SPACs and many of these have launched with rich valuations, are pre-revenue, pre-production, have negative cashflow. Last year we saw a fourfold increase in the number of SPACs versus 2019. There was more than two dozen that were related to the electric vehicle space alone across verticals like battery, hydrogen, as well as electric, and more than 20 billion in assets raised.

I'd say that the good news is that a lot of the SPAC activity has probably set forth a larger wave of capital pouring into early stage clean tech, but there are certainly some risks. These companies, they have a lot of capital to work. Will they be able to successfully implement their business plans? I think you just really have to be careful when investing in this space that diligence is really important to understanding the intrinsic value of a company, understanding when the price is right. But the good news is it certainly has grabbed investor attention. We're probably going to be in a situation in a matter of months where most auto manufacturers are offering an electric vehicle. Hopefully in a couple years we will be in a place where those electric vehicles are affordable to most everybody. We're now at a point where companies are starting to rethink their longterm pipeline of offerings and their go-to-consumer. I think sometimes, with these flurries or bubbles, they can actually spark an innovation-led economy, and we did see that in the '90s. Oftentimes in bubbles, you tend to have a period of stark innovation.

**Sid Ahl (18:30):**

Yeah. Good thing about this is all the capital going into the space. It will spur innovation and potentially set forth the next decade of growth in that area. But it may be somewhat separate from the investment case for a handful of those individual companies that have come public, especially via SPAC recently. What has most surprised you in markets over the past year? It's been a pretty wild ride. What has stood out?

**Paul Chew (19:01):**

First off, I'm shocked at how resilient the market was prior to the vaccine news on November sixth. That was a game changer for the economy and for the world with the vaccines coming as fast as they are. But we were still pretty much flat for the year at that moment in time, which is an extraordinary accomplishment given where global economic activity was. We live in a bubble. The investment world has been great, but I think there's a lot of damage that hasn't yet been shown to all of us as we start to get back to normal. I think about how many restaurants have closed. You don't just wave a magic wand and get them to come back. I've been shocked at how the market was able to come off of the lows that we set in March. I realize there was a lot of fed stimulus that was leading to that, but it's still pretty extraordinary to think about having 10 million plus Americans out of work, people surviving because the government's giving them checks, and to think that the stock market through the end of October was flat, just really didn't seem to fit the narrative that was out there.

**Sid Ahl (20:32):**

I would totally agree. I think it was amazing how much investors reacted just purely to the stimulus that was provided by the fed, the ferocity of that snapback. I remember we talked about it and wrote about it a few months into the recovery. It was just unbelievable how quickly people remembered. I think their experiences from 2008 and how powerful zero interest rates and even just the threat of coming into different markets and buying assets was in supporting their prices, and people pulled out their playbook and ran it back. Thank goodness vaccines arrived.

**Erika Pagel (21:13):**

Yeah, I guess a couple things really surprise me. I would agree by the swiftness in the market reaction, really only seeing a draw down for a couple months and then moving much higher quickly. But I guess I would say just how quickly consumer behavior changed. That's as us as consumers, but also how companies were able to really quickly implement new ways of doing business, rather than being person-to-person, really pivoting towards online. There was a lot of businesses that were very successful at that, but it is also important to note that, yes, we are seeing a market recovery now and have since mid last year, but there is still a lot of individuals out there that are under-employed or unemployed. If you look at the leisure and the hospitality sector, there's still more than 20% fewer people that are employed in that area. If you look at the unemployment rate for those that have to return to their job site versus those that can actually work from home, there is a pretty large divergence of trend.

A couple other areas, certainly the resurgence of SPACs. Here we are in a supply demand/financial crisis last year and we have this flurry of IPOs and SPAC activity. Frankly, IPOs in more volatile markets tend to be a little bit more difficult to get through, so these SPACs have certainly flourished. When I think about what might ultimately come out of it is there's been few times in history and

points in time where there's actually a shift, and innovation and disruption has led to these shifts. We could be at another tipping point right now that kicks off years of new innovation and disruption in certain industries coming out of this. Probably a lot of it will be tech-led, healthcare tech, financial tech, possibly tech to solve for climate change risks. We're starting to see some of that and I think it'll be fascinating over the next several years what consumer behavior actually maintains from over the past year, and then what actually goes back to normal.

**Paul Chew (23:56):**

Sid, as Erica was talking, one of the things I thought about was that one of the most amazing IPOs last year was Airbnb that it doubled on its first day of trading. But if you go back to March, they were so strapped for cash, they laid off most of their employees and they had to take an emergency loan from Silver Lake Partners just to make payroll for a couple of months. Within six to nine months of that moment in time, they were coming public and was the kind of best IPO of the year. It's crazy to think that they went from where they were in March to an IPO that doubled on that first day. It's amazing how short our memories are as investors.

**Erika Pagel (24:48):**

I guess that the fixed income markets too surprise me a lot. Sid, I don't know what your thoughts are there.

**Sid Ahl (24:55):**

I was definitely surprised I think with the sell off in investment grade corporate bonds, really municipal bonds, anything that we usually thought of as the stability asset in the portfolio. We've talked about this. We've rethought a bit that allocation in portfolios, given lower rates and given the performance of that segment of the market in March. Clearly, it rebounded very quickly when the Fed came in and provided support. But drawdowns of 10, 12% in high-quality corporate and municipal bonds were not something I think we were expecting.

I think I'd also throw into this mix, clearly, I've been very surprised by this retail trading renaissance. I mean, I think zero commission trades and cheap and widely accessible margin has reinvigorated the retail trader not just in the US but in Europe, in Japan, elsewhere in a way that I wouldn't have really thought possible. Their use of options and leverage is pretty stark. The ability of them to move relatively large company stock prices pretty meaningfully is something that's new that I think is fascinating. I mean, the fact that we have a lot of the hedge funds that we're invested with right now dedicating resources to scouring Reddit to see what the next stocks are that are trending so they can avoid these types of situations in the future is really something.

So maybe I can shift a little bit here and talk about one of the risks or the primary risks to markets that we've talked about a lot and that is interest rates. Clearly, a lot of the hyper-growth companies benefited hugely from low rates. The closer we got to zero, the lower and lower the discount rate for those very distant future cash flows for these companies. We saw valuations that we'd really not seen in quite a long time or perhaps ever before. We've seen some of those names take quite a breather, a pause here as interest rates have started to pick up. What do you both think of the risk of rising rates and inflation to the markets right now in general and what are you doing about it?

**Erika Pagel (27:26):**

Great. Well, thanks Sid. Certainly, the strength of economic data that we're already seeing and the level of stimulus that's been injected over the past year could result in an upside surprise in inflation, and whether or not that's this year, next year or more in line with the Fed's target out a couple years. But for a while now, we've been talking about this year as being almost two halves, right? So the first half very much focused on what we're going through right now, a recovery, a period of enthusiasm, back to normal, starting to pick up in spending. Then the second half really seeing that burst to consumer spending and an improved economy, one that could result in the rise in the price of goods and services and subsequent inflation.

We're already starting to see that in many areas. We're seeing some disruption in areas of the supply chain, freight and container and shipping costs. They have helped to drive up commodity costs and commodity prices. We're seeing it in plastics, aluminum, timber pricing has gone up substantially just since last quarter. We're seeing it in oil. Frankly, many companies in their most recent earnings reports have started to mention potential volatility in raw material or logistics costs. What is going to happen with foreign exchange now that we're seeing a little bit of a lift in the dollar? The cost of delivering to consumers might be higher.

So whether or not this will be a standalone cost push type inflationary environment where input costs rise leading to higher prices in certain industries, could it be demand pull similar to what we saw in 2011, just as we all start to try to get back to our new normal. Maybe it will be both. I think, the bigger question is, will this inflationary pressure be sustained or will it be transitory just as the economy rebounds? At what point will inflation be above that 2% or really edging up to 2.5 to 3% for an extended period? In that case, probably the Fed will let longer term rates rise. But there is a long way to go from where we were in the early '70s when inflation jumped to 6% in '72 and '73, and then in '74 jumped to 11%. So it's important to make that distinction that that is a ways to go.

**Sid Ahl (30:15):**

I was just going to say that we've talked a little bit about this, right? Inflation in the '70s. You had some pretty unique factors at work. You had the oil embargo, which led oil prices to jump 300% and you had wages increasing 10% a year as we were coming off of peak levels of unionized labor in the US. So you ended up getting that kind of double digit inflation from that cost push of higher wages and the shock of oil prices moving higher. We also saw that build over a number of years. I'm curious if you both think that we'll have enough time to react to this, and if you agree that generally it seems like a long ways off from 1970s.

**Paul Chew (31:07):**

So I think the hardest thing for any of us in the investment world right now is inflation for this aspect, right? I've been in the investment business now 30 plus years. I have not had to worry about bond prices declining and yields rising or inflation without... I mean, there's been periods of time where we've seen a little bit of an uptick in inflation, but nothing that would really warrant your attention. So I'm not sure any of us that are really in in the investment world today have the playbook for how to deal with inflation, because it has been so long since it's had a meaningful impact on your investment portfolio.



**Paul Chew (31:53):**

So I worry a little bit about that. You think back to pre-pandemic and you start to think about how low we were in the employment world, right? The jobs market was fantastic. People were getting hired. Unemployment was very low and that didn't spark inflation. You kind of go back and say, "How did that not happen?" to me is very surprising. If we're on trajectory for eight plus percent growth this year, by middle of 2022, we might start thinking about the labor market being pretty difficult. Maybe one of the things I worry about from the pandemic is that we may have shrunk the labor force enough during this period of time, because this has been such an odd environment for all of us, an odd environment for me personally.

People start to make different decisions and we've seen drop out of the workforce. To think that we're not going to have inflation when this comes back on a wage basis, you have to make the assumption that those people that left the workforce are coming back into the workforce at this moment in time. So I worry a lot about inflation, to be honest. I'm not certain I have the playbook right now to kind of make my way through it if it actually did happen. Quite frankly, our Federal Reserve chairman and board of governors, they've not had to be in that seat during a period of time of inflation either. So it's going to be a new environment for all of us, I think, if we do actually see inflation pick up.

**Erika Pagel (33:39):**

Yeah, I would agree with that. Equities can also be an effective way to hedge against inflation. I mean, there's a lot of industries and companies that tend to do well in higher inflationary environments, industrial, transportation, materials. Frankly, some areas that that could be impacted by an infrastructure policy, consumer and defensive sectors could also play a role in this. So higher dividend companies. So I think, in many ways I agree with Paul. It's certainly something that is on our minds, inflation. We're speaking a lot about it. But staying fully invested, equities could be one of the best hedges against inflation going forward.

**Paul Chew (34:23):**

I was just going to add to the comment, Erica, you just made about in a period of time of inflation equities can do that, particularly if you're investing in businesses that because of the quality of the business, the standing within the organization in their marketplace, they're able to actually pass along price increases onto their end consumer. Now, that does create inflation in the system, but I think the better positioned a business is during that environment, I think, the more successful you will be from an investment perspective.

**Sid Ahl (34:58):**

All right. So we've talked about some of the changes we've made in portfolios recently as a result of all of what we've discussed, potential for rising rates and valuations, particularly in the higher end of growth. So we've shortened duration in bond portfolios. We've tilted more towards value oriented strategies. We've invested more in real estate and infrastructure assets. Let me ask you both, have you considered putting other uncorrelated assets in portfolios like gold or as they call it digital gold, Bitcoin?

**Paul Chew (35:33):**

So I have never formally invested in gold in my career. I'm as tempted as I've ever been during this period of time. I can't tell if it's just because it's a poor man's Bitcoin or what. But you start to think about inflation expectations is something we've talked about on a conversation that has garnered market attention, and this is probably the first period of time in which if you look back historically at periods of time when inflation expectations are rising, gold has historically done very well as an asset class during that period of time. Given every caveat that gold is a really difficult asset class for us, we believe in cashflow, the only cashflow that comes from gold is actually selling it to somebody else, not normally something that we would think that we can put a valuation on.

So forget trying to peg whether it's cheap or expensive, it normally reflects the inflation expectations, and over the last six months, it has not. I think that has become because people are enamored with the concept of Bitcoin as a store of value. I think gold and Bitcoin are very different. I think of a Bitcoin more as a currency than I do ... I don't put gold in into that camp. I'm more tempted by gold than I think I've ever been. I haven't pulled the trigger on it yet, but I'm thinking about it.

**Sid Ahl (37:16):**

Erika, where do you stand on the Bitcoin and gold topic?

**Erika Pagel (37:20):**

Well, as Paul mentioned, gold has been out of favor lately, and it's frankly fallen since August of last year. Probably some of that is because of buying in crypto or Bitcoin, but you're also having that interest rate effect, right? So what Paul mentioned is right, is that this is an asset that often trades on investor expectations, and it tends to start rising as inflation is anticipated.

There's a couple things. It is really hard to value gold or find its intrinsic value. It is often referred to as a store of value in inflationary times given higher prices, but absolutely, I mean, there are clients that look at having a gold holding as an insurance in their portfolios, really protecting from a potential Black Swan type of event, whether or not that asset actually performs in that way. From a sustainability standpoint, ESG and gold, it's been a debate for a long time, and there's a long history of past challenges. There's high cost to the environment. Mining is very water-intensive; frankly, mining precious metals is a very capital-intensive business. The waste from production can often result in the leakage of toxic chemicals into land or water supplies. There has been some clear ethical examples over time, the very sad events in 2017 of the tailings dam collapse.

So there's absolutely ample opportunities to improve, and there are a couple of programs or gold mining principles out there that are developing new frameworks for ESG. Will gold ever be socially responsibly sourced? Will it ever meet ESG standards? It's probably going to take some time, and frankly, on Bitcoin it's a similar story. There's greater demand with higher prices, which leads to more miners using increasingly powerful computers that need more energy.

It is important that Bitcoin is not alone there. Commodities overall have a big energy draw, and whether it's Bitcoin's reliance on fossil fuels versus renewable, unfortunately it's really hard to get that exact consumption, and it's hard to really know what the accurate data is out there.

I think there's some other risks with Bitcoin as well. There's a lack of regulation. There's certainly exposure to illicit activity, and if miners could demand the most efficient energy hardware and replace old equipment, there's topics of green Bitcoin that could be helpful in eliminating or reducing some of that environmental risk.

I'd say we're certainly getting asked about both right now, and the truth is both of them are very hard to value. One has not been time tested. Another has been time tested and has different performance in different rising rate and inflationary environments.

**Sid Ahl (40:48):**

Let me ask a bigger-picture question. Just when we think about the next 10 years of investing, what are the biggest trends that we all need to be aware of?

**Erika Pagel (41:02):**

I'm very much thinking about the next round of new innovation and disruption in certain industries, and I think the energy transition, implementing it, is going to require very thoughtful planning. It's going to require thoughtful planning around the changes to many legacy and long-term models, and as more governments and companies commit to a net-zero emission goal or something similar, that shift is going to take time. It's going to mean displacement of some current infrastructure, some change to current infrastructure, land-use change. There will be costs associated with it, but I think energy transition is not only in infrastructure, it's going to likely be tech-led.

**Erika Pagel (41:58):**

Climate change will impact every industry, every company in some way, and those that are able to recognize how to improve their business models for the future will certainly be leaders going forward. So I'd say that is top on mine. It's not only a move to electric vehicles. It's how can consumer companies continue to reduce plastic or waste within their facilities, implement more efficient lighting in their stores or whatnot, how can insurance companies play a role here?

**Sid Ahl (42:44):**

I think that the other angle of that, just the changing consumer tastes and preferences, which require all investors and all company managements to be aware of these trends just feels to me like it could define the next decade of investing, because if you're not aware of what is going to be demanded from you by your investors, stakeholders, clients, you're going to miss the ball.

**Erika Pagel (43:11):**

Yeah, and we're already starting to see shifts in consumers. Consumers care more about the food they eat, where they buy the food, that type of shaving cream they buy, where products are made. That coupled with climate-change awareness is likely going to impact how companies do business going forward.

**Sid Ahl (43:31):**

That's fascinating to see some of the previously not sustainably oriented external investment managers that we have really zeroing in on this, finally realizing they have to play catch up and understand this on every one of the companies they're investing in and hiring. Certainly will be a job

role where there will be a good amount of demand is helping people understand these trends better within every investment organization. Paul, Erika, thanks so much for joining me today. That was terrific.

**Erika Pagel (44:02):**

Sid, it was a pleasure. Great speaking with everyone today. Thank you.