SCOTTISH MORTGAGE WEBINAR – INVEST IN PROGRESS

In this webinar recording, investment specialist Stewart Heggie talks to James Anderson and Tom Slater, joint managers of the Scottish Mortgage Investment Trust about the growing opportunities that lie ahead for the trust. From transport, to healthcare, to an energy revolution, there is plenty to be optimistic about in 2021 and beyond.

Stewart Heggie (SH) : Hello and welcome. I'm Stewart Heggie, an investment specialist in the Scottish Mortgage team. Before anything else, I'd like to thank you all for joining us as well as your ongoing support of the trust.

I'm delighted to be joined by joint managers James Anderson and Tom Slater, and at this time of year we normally hold live events, so we're sorry we cannot be with you in person, but we certainly look forward to doing so in future. We hope that you and all your families are well now just to give you a feel for what lies ahead today, this webinar will be split into two parts. The first will be a discussion between James and Tom, which will give you an insight into how they work together, and following that we'll turn to live Q&A and that function should now be open at the bottom of your screens.

At Scottish Mortgage, we think in decades rather than calendar years, but recognise that 2020 was an extraordinary one for several reasons, and the trust itself a lot of the attention has been on the returns delivered to shareholders as well as companies, driving returns such as Tesla and those that accelerated during the pandemic, such as Zoom, Amazon, Netflix, or Meituan Dianping, the Chinese delivery giant. However, over that period, two points really stand out for me.

First, the high level of competition for capital that exists in the portfolio and that has seen some long-term holdings depart such as Facebook, Trip or Inditex and in their place we've seen additions to existing holdings that are experiencing increased returns at scale, as well as some new names arriving in the portfolio, particularly in the latter half of the year.

And the second point is despite these challenging conditions that we're all living through, is the operational progress being made by many other growing companies in the portfolio, just broadening out the opportunity sets and creating a way for growth.

And that really takes us to a question on many of your minds. Scottish Mortgage itself has grown. So what is the opportunity that lies ahead for it?

James, if we could start with you. What's your view?

James Anderson (JA): Well, but I'd like to put a slightly different emphasis of the context.

To me, our task isn't primarily about any one year's performance or about growth versus value or the like. It is about trying to build our underlying competitive advantage. And in that context scale becomes a virtue rather than a hindrance. We have the abilities, connections, resources is in a much greater way now to be able to build that competitive advantage, and if I may, I'd like to spend two or two or three minutes talking about that.

At the first level it is about where we are with companies and the level of engagement that we can have, and I would stress that that isn't about the moments of success. It was much harder working through the issues with Tesla at a time when it was broadly hated, at a time when the company itself was struggling to scale that it has been recently. To bring that up to date with Illumina now over the issue of taking over Grail and where they're going, or with Alibaba, and the questions that we all know about.

It's this time that matters. It's doing the hard work. It's having the trust mutually with companies here that really is important, and I think that one of the most influential conversations for me last year was with Daniel Ek of Spotify. But we weren't talking about Spotify. We were talking about the process, if you like, of growth.

And the point that Daniel was making was that you don't start off being able to cope with these immense challenges. It's the actual experience of going through it. Or, as Tom puts it to me, putting yourself in uncomfortable positions, that really matters from that point of view and I just think we are in a far stronger position on that now.

Then I'll move on to something that I think is broadly misunderstood, but is incredibly important to me, which is trying to build our broader expertise with academics and scientists and the like, and I think that, this alters entirely your perspective on what is useful information. It colours your expectations of progress. It colours your time frames. Just to put it in context, in the last 24 hours I've been engaged in conversations with all of the Santa Fe University Institute, with the Long Now Foundation and with Carlota Perez. And you know, as we go through this, I think the various perspectives that these brilliant people give us will show up. You know we are not trying to be clever. We're trying to learn and I think that's really important.

Lastly I think there are some specific elements which are very much Scottish Mortgage alone. You know the previous two ones have a certain amount, a certain amount in common with colleagues of Baillie Gifford. But the next two really don't in a big way except for very specific cases. I'm just amazed Stewart, where we've got too in private companies in the close to a dozen 10 years since we've started in this path. I genuinely did not believe, and I don't think Tom did either, that we could transfer a certain reputation in public markets to access to the greatest private companies in the world. And that is frankly where we are now.

You know just to take one little known but very current example. We've been shareholders in a firm which went public in a fairly dynamic way last night in America. For several years, both Tom and I have spent a lot of time with the company talking to them at moments when going public seems a very long way off.

But whether it be in America, whether it be in Europe, or whether it even be with the profound help of our Chinese colleagues in particular, Linda Lin in China, we have access, and that is not just access, It’s a matter again of learning. We can know so much more about the future by engaging with these companies. And I think that's something that is getting a greater and greater opportunity still for us, and that links into the last one, which I think is sort of unpopular to talk about, but we must, which is the cost basis.

Given the scaling of Scottish Mortgage, well over half the assets will only be charged to quarter per cent fees. Now if you think about it, we can have this substantial exposure to private companies to which your average manager - and I mean average rather than good one - would charge you two and 20 at least. Now that would cover the entire fee of Scottish mortgage. So I think we've delivered on our promise to make this accessible and at a very low cost manner to individuals, intermediaries and that really matters in terms of building those competitive advantages I was talking about. I'll leave it there, but you know, I really did want to get those facets off my chest before we start on the detail.

SH: Tom, any news from you?

Tom Slater (TS): Maybe just to expand on the point about the advantages of scale, because I think that can be counterintuitive to people. So if you want to invest in a private company, if you're investing from a larger pool of capital, does that mean that you can't get as big a holding or as large holding us you might want? Well, that definitely is not the case. If I'm a private company trying to raise capital, I would rather make a small number of phone calls, not a large number of phone calls. And if there is a potential investor who can write the whole cheque rather than just contribute to the pool, then that is the phone call I will make first.
And so, scale becomes a competitive advantage, not just because you can keep the costs to a minimum that allow you to do these transactions, but, but because you get better opportunities, because you get earlier calls. And I think that that can be a misunderstanding when people are thinking about scale.

Maybe the other one which James touched on, but I think is also really important is the one around access to management teams and therefore the inputs from those individuals to investment process. There are two things that really matter there. One is scale and the other is how you behave as an investor. People talk about reputation but I'm not sure reputation is as important as simply how you have acted in the past. It matters that that you can demonstrate you've been a long-term owner from these businesses through their life as private companies and through into the public markets, that you haven't treated liquidity events as an opportunity to exit or crystallise the gains, but instead as an opportunity to buy more.

And the entrepreneurs are very aware of how you've behaved, and that's very much how they think about who they want their shareholders to be.

SH: And Tom where is the pipeline of ideas coming from on private companies? Where are you getting your access?

TS: Well, I think this is one of the most exciting parts of the answers Stewart, to your opening question about where do you go from here?

There has been this cluster of innovation in the San Francisco Bay Area. There have there have been some phenomenal companies that have grown out of the consumer Internet and what's exciting to me about today is just how rapidly that is broadened into sets of companies that are addressing a really diverse range of end markets and industries. Arguably ones that are a lot more important than some of the consumer internet use cases, and from a broader range of places.

China is particularly noteworthy. To give you a sort of anecdote there. One of the last times I was on the West Coast of the US, I met Toby Lutke, who is the founder-CEO of Shopify, one of our big holdings. And I'd seen an interview with him online where he talked about the advantages of basing his company in Ottawa in Canada, but that necessitated coming down to Silicon Valley three or four times a year to refill his hopper in terms of innovation and new ideas and experiments. And so that's why I asked him are you, are you here on one of your visits, trying to get inspiration and about innovative ideas? His response was “Oh no, you are three or four years out of date at this point. If I'm looking for inspiration and new ideas, I go to the East Coast of China, not down here to the West coast of the US.”

And what we're seeing is a pipeline of new interesting businesses driven by founder managers operating at massive scale coming through from China. And James talked about our colleague Linda based in our Shanghai office. Putting significantly more resource into that area and expanding the capability in terms of developing the pipeline and private companies, I think is another really important part of the puzzle about how do we get better at this point? How can we improve on what we're doing?

SH: A number of companies have benefitted from Moore’s Law, the assumption that computer power doubles every two years. James, you have been doing some work in this area. I wondered what your outlook was and what the impact would be if this growth were to continue

JA: I think Stewart this is still of unparalleled importance. Really, Moore's Law has carried the world in productivity and growth terms in the last 30 years. But it's becoming more powerful, and one of the most significant meetings that we've had was one of our sessions with a ASML who really, as a little known European company, are critical to the survival of Moore's Law and I was amazed their Chief Scientist, are a veritable genius said ‘Well, now we've solved EUV [as they term the latest technology] it’s easy for the next 10 or 15 years.’

Now I very much doubt whether any of the three of us would find that easy, but it really matters. Translate that - if we say we've got another 12 years of that and we're slightly below the doubling every two years. Well, that translates into approximately a 60-fold increase in computing capacity. 60-fold. Now trying to get your mind around the implications of that is hard. But as I was discussing with our sadly now retired, but esteemed, emeritus board member John Kay a few weeks ago, we should take it as likely that although we don't know precisely where that goes, there will be whole industries transformed by that potential 60-fold increase.

It's beginning to heed industries well outside of what we define as information technology, and in particular, as I suspect you'll come onto, Big Data is finally in combination with Sequencing's own exponential growth beginning to be transformed. So I think the implications of Moore's Law will, if anything, be even more profound in what they transform from here than they have been over the last 30 years.

SH: I suppose working that, with Moore’s Law in place, 2020 might not only be associated with Covid-19, it could be marked as something of an energy revolution and a shift away from carbon. Now clearly this is good news for humanity in combating climate change, but Tom, what does that mean for you as a long-term investor?

TS: Just maybe linking that question Stewart, with the place James ended in his last point. It 2020 was a very difficult year for many, many people in all sorts of different ways, and I'm absolutely not trying to minimise that. But if you move away for a second from all the challenges and the negative headlines that we saw in in 2020, I think one of the absolutely remarkable things about what happened was the efforts of one of our holdings, Moderna, to address the situation and another of our holdings, Illumina in providing the tools for that to happen.

So in effect, it took four days to find the solution to the Covid crisis, two of those days were sequencing the virus and two of those days were taken by Moderna taking that sequencing data and translating it into an RNA molecule that would trigger an immune response. And now obviously it's taking longer than that from the launch of lock down to the first vaccinations and it's the appropriate process in terms of regulatory testing, but it actually finding the solution took four days.

And so if you're trying to measure the impact of scientific progress, the impact of modern technology, the impact of Moore's law on the healthcare system, I think you have to think of it in those terms.

In terms of energy and what 2020 may or may not mean for that. I think there are some really long run really predictable trends in place here, so the cost of generating energy from solar panels has fallen at 20 per cent per annum, pretty predictably for the past decade. The cost of storing electricity in a battery has fallen by about 16 per cent for every doubling in global battery capacity. So when we're talking about these issues, we're not trying to make predictions about technological breakthroughs. We're simply observing some quite long-run trends that have been in place that are facilitating big changes.

I think what you've seen in 2020, which is possibly a necessary ingredient to what you're talking about, is a massive change in the attitude of capital markets to the opportunity here.
You've seen that in part in the share price of some of the electric vehicle companies and Tesla. You've seen that in the, at my count there's twelve companies that have that are operating in the electric vehicle space that have raised half a billion dollars each. You're starting to see significant capital pumped into this area, and it's that access to capital that will really facilitate an acceleration in adoption of those types of products. So I think the change in 2020 from an electrification standpoint mostly occurred in capital markets.

JA: I don't know Tom. Perhaps can I add Stewart, think it's more dramatic than that in a way, as you say, it was very predictable. But to put it in context, the cost of solar energy is currently running somewhere between 50 and 100 years ahead of the International Energy Agency's predictions from 2010. You know, I think that the technological progress, partly as you say, by the application of capital has really mattered. And I would also throw in that I think that underplays what's going on in China, which I think is both terribly important for Tesla, itself and after all, the scale of opportunities. I could sort of slightly throw back and say we can now get lucky enough to get lots of questions about the value and rating of Tesla. Of course Tesla way underperformed NIO last year, so perhaps we should be asking Mr. Musk why they're doing so badly… I'm going to by the way!

SH: Batteries is going to be a key area here, and you have a new acquisition in the portfolio in the later half of the year, it being Northvolt, and I wonder if you could touch on, first of all, how that relationship came about and what the important learnings might be from Northvolt?

JA: Well, I think it is just the European example of what Tom was eloquently talking about a few minutes ago. It is a network of connections in these areas. So we were approached via two Scandinavian CEOs who we work with a long time, one of them being Daniel Ek, who I mentioned before, one being Christina Stenback of Kinnevik, who thought that we would be the best external public markets investors to be involved. But you're right. Stewart and Tom's right. It is proof of both the application of capital and what we were talking about about the information we can get. Northvolt offers very valuable quarterly three to four-hour sessions going through the development of the technology, going through where it is in different markets, going through how it applies to different car companies. So it is all part of this learning process and very important to us, so you know both being invited in and what they're willing to talk to us about matters a lot to us.

SH: And Tom, I suppose we've been talking a bit about transport and its relationship to this energy change, but there are a number of other applications for the future. Would you like to say a few words on those?

TS: Yeah, sure. I think transport is fascinating, but we should keep the context that it is one example of an industry where we're seeing the combination of advanced software ability to handle huge volumes of data, ubiquitous mobile connectivity, leading to new business models, new opportunities and opportunities that happen at a massive scale.

And so in thinking about transport more broadly, we've touched on electrification of the vehicle fleet. I think it’s now almost inevitable. Near term there's quite a clear perspective on it. But there are other big opportunities, so another would be in self-driving capabilities or autonomy. And that's another part of the Tesla story to pick apart, but the business that would operate at that scale with software type margins would be extremely attractive. Tesla are doing that. But we also own Aurora who are seeking to do this for everybody else if you like, trying to enable the traditional OEMs to compete with what Tesla and Google's Waymo are doing. We own a Chinese company that is seeking to do that on a different scale again at cost price points that would be economic in China.

But that's just automotive. There are lots of other applications. We own Convoy and Full Truck Alliance. What they're looking to do is automate the process, which today is very manual of matching freight loads to trucks. And this is only become possible in the past five years when truck drivers started carrying smartphones around in the cabs of their lorries. It provides a huge data footprint which you can then apply machine learning algorithms to and eek out the efficiency gains which are impossible for individual humans using phone calls to identify.

Then you could go to delivering. We own companies like Neuro in curbside delivery. They produce autonomous electric robots to do curbside delivery, which we think will be a really important enabler of the next leg down in cost of home delivery.

And we own Zipline, which does medical deliveries via airborne drones. And again, a technology which has developed in parts of Sub Saharan Africa to become national infrastructure. But as a result of Covid and the need to move on rapidly in improving distribution infrastructure has recently launched in the US which is obviously a market that expands their addressable opportunities to many times of the scale previously.

So there are all sorts of these opportunities in transport, and it's just picking up on these underlying drivers which are creating these opportunities.

JA: So I'm very disappointed that you haven't pursued that into outer space so that we have to become rather more than global, universal.

TS: And well, I think what is really interesting there is not so much technology but cost curves and, imagine how often we would fly if you had to scrap the airplane upon arrival and start building a new one.

The growth that we've seen in air travel over the past several decades has been facilitated by cheap and reliable transport. As you start to bring that into the space sector, and we have holding in SpaceX who have obviously very publicly achieved some remarkable reusability, but more quietly massively reduced the cost base of launching into space, started to launch a low Earth orbit satellite constellation that has the potential to revolutionise the communications industry.

And more recently, with Relativity Space, which is looking at using additive manufacturing or 3D printing to actually dramatically lower the costs of producing the rockets again, so I think as you write to highlight it, it's one of these areas that that seems science fiction if you go back five years.
But it is rapidly becoming a really interesting commercial opportunity.

JA: If I could, perhaps Tom, pursue that for a moment or two. I mean, in some ways isn't energy more than just one other application? I mean, it seems to me that we have the record of very few energy revolutions in human history. Far fewer, sadly, that we have a pandemics and plagues. we've got one now, and you know, I think there's a very good case for arguing that I was the energy crisis in the 1970s that fundamentally through the world of productivity improvements. And if we can now replace that desperate search for more carbon with greater technology with almost free renewable energy, then the prospects for the world are transformed.

For sure, I think we both agree that it's terribly difficult to work out, but equally exciting to try and workout what the consequences are. But to me, the end of carbon is an epical occasion.

TS: And I do agree with that, James I guess I was focusing there on transport, but I think the energy piece is, I think that the really challenging aspect, the really exciting aspect of that when you, when you think about what we're going to be doing over the next 10 years is thinking about the second order consequence.
I see analogy to what happened to the shipping industry. If you look back to the 1960s and 70s where you've gone from a situation where shipping was an operating cost business to an industry where it became a capital cost. When you had no incremental costs to operating a ship, you never saw capacity come out of the market. You saw this dramatic reduction in the cost base, and then you subsequently see the global supply chains utterly transformed over the next 20-30 years with huge benefits for global economic growth.

And I think there are some real parallels there, but from an investment standpoint, the challenge is thinking through those second order consequences. You know if you had known with perfect foresight what was going to happen with the internal combustion engine, would you have predicted Walmart? That's the interesting part from an investment standpoint.

JA: Totally, it so reminds me of one we we've quoted and misquoted from the early age of the Internet from Moore's Law, isn't it Jeff Bezos – 'There's this weirdness about our business. It gets 40-50% cheaper every year' then the pause, 'and I don't know where this takes us, but it's going to be exciting.' I think observing that is quite right.

SH: Well, James and Tom that the provision of Healthcare is currently on everyone's minds and Tom, you've touched on some of the companies in the portfolio that are helping to tackle the pandemic, but as a broader group in the portfolio they are addressing a wide range of opportunities and they all have their own individual drivers for growth so James, how do you approach the task of investing in these healthcare names doing so many different things?

JA: I think it's a lot of what Tom and I were talking about just there in general around exponential technologies, engine transport becomes applied to healthcare. I think it's incredibly important, Stewart, that we observe and we try and learn and we try and have contact with the greatest and most innovative companies in this area, as well as trying to put thematics that come from academia on it, and I think that's what we're seeing already, and I'd give you a couple of examples.

As I alluded to at the start, we've had a lot of meetings with Illumina and Grail in recent months, and we had a particularly fascinating session with Alex Aravanis, who was the Chief Scientific Officer at Grail and has now returned to Illumina to supervise the combination. And he said, 'Look what you've got to understand is that if you combine sequencing with machine learning moving towards AI, then we're getting insights, and we're finding indications for healthcare that are running well ahead of our understanding of human biology, which completely reverses the whole process of discovery.' And that in a sense, is what we've been looking for for the last five years as we hoped, but couldn't guarantee that this change would come about, and that that would morph into the second example, which is one of our unquoted companies, called Tempus based in Chicago who are really beginning to see that enormous quantities of data are translating to actionable healthcare recommendations. And even some of the audience may have seen over the last few days, Tempus have just revealed that what they're offering is a very small dice-like device, which will go in hospital oncologist pockets to be able to provide them effectively with AI answers to all the queries they have. Or you know, to go back to that conversation I mentioned with John Kay, as John said, heaven help the standard general practitioners of the future.

TS: Maybe to just sort of pull out that point and do a compare and contrast here. If you think of where we are in consumer Internet and look at some of our past Holdings, these companies, Twitter, Facebook, have used AI to process huge volumes of data and created interesting business models out of it. But the stage they're at in that process, they're grappling with some of the implications of that. You know, who decides how opinions are disseminated? Who should surface the content to me in my timeline, in my feed, who makes those decisions? How does AI make those decisions?
And so the phase you're at is not about growth or innovation, but it's actually dealing with the consequences of those challenges. And that's now, in our view, weakening the investment case for some of these companies just because of where the focus is, where the attention is, where the energy is going.

But compare that to what's happening in the areas we're talking about. If you were doing genetic research 10 years ago. As a PhD you would research one gene and you go and you would either knock that gene out or amplify that gene in an animal model and then look what the consequences were of taking that action. Study the data that arose from that and you do it one gene at a time.
And having found out some of the consequences, you then would enter into very laborious scientific programmes to actually go in and intervene and see what you could do around that.

Take that forward to where we are today. tTere are 7 billion humans on the planet. They each have 6 million unique genetic variations. So there's a vast data set which you can then compare against phenotypic data. So what can you say about the health of that individual? What are the health problems? What that means is instead of going gene by gene, you can look at massive scale at the implications of millions of variants on different states of disease simultaneously. But you can only do that if you can handle the datasets. You can only do that if you can deploy machine learning against those datasets and then that takes you to looking at the pathways of action. And there's a whole new set of tools that allow you to act quickly in terms of finding interventions against those pathways, either at a genomic level or at the protein level or at a small molecule.

And that's a really interesting machine learning computer science problem, and that's where the innovation is. That's where the action is at and that's where we see some of the really interesting opportunities in in broadly defined healthcare.

SH: That's great. I'm aware of time and I see the number of questions ticking up which I'm keeping an eye on. So I thought we might move on to the audiences questions. The first of these is around China, so Scottish mortgage has enjoyed tremendous returns from the from Chinese holdings in both public and private markets. But for the largest and most successful firms, the likes of Alibaba, seem increasingly subject to state influence. How are you thinking about their prospects from here.

JA: So we think the current change, change be it is more marginal and in line with policies than dramatically different. You know, I think you would have all of expected us to consistently have asked ourselves questions on this front. We've always thought that China was both concerned if any power rose up against the party, particularly in the somewhat spectacular way of favored by some of the individuals involved. But we've always thought that was subsumed in a deep knowledge that for China to modernise required the spread of technology, data and the like. So actually what we think is happening is that China is moving principally to a policy of greater antitrust requirements in a way that actually, I think would have been beneficial in America and Europe. Now, none of that is to excuse aspects of the Chinese political scene or the directions it’s gone. But I think from the operating conditions of the companies, it's not as bad as you think, but we do really need to take our time and think when the companies are willing to talk about this.

We've had, I thought quite a profound conversation with Tencent in recent weeks on this and Alibaba asked us for time, but we have scheduled a meeting next week to talk about all this on their request. So whilst we think it's very dangerous to respond to headlines - headlines that have thrust the attractiveness of the equities down, even before economics play out to too great an extent, please give us time to work through all this, we do not think the overall operating conditions have deteriorated as drastically as the media would like you to believe.

TS: It's probably worth saying as well, James, this is not the first time - in fact, far from it – There have been interesting regulatory challenges for these companies in China. If you go back two years, we were all talking about what was happening at Tencent and the government's clampdown on violent content within video games. And whether that marked a divergence in views between the private sector companies and the government, but they worked through to address those issues. There was some hiatus in in growth, but actually you know the high degree of alignment in objectives between these companies and the CCP continues to exist.

I think the other point to bring out, and it's also an important one from an investment standpoint is if the government is becoming more thoughtful or cognisant on antitrust and scale of the largest players, that will help to reinforce the dynamic that we see in China of the next layer of companies coming through at a speed and on a scale that we haven't seen in in Western markets.

So one of the big success stories for us of late has been Pinduoduo and what they do is, it's a retail platform connecting the enormous supply chains in China to end consumers. They've really done a great job of unlocking demand from the next half a billion people in China who are not particularly comfortable with Alibaba’s tools etc. By creating an experience which is fun and engaging, which is always been one of the challenges in online retail – we’ve been waiting for the companies that can create a shopping experience that's enjoyable rather than functional. And so if there are more constraints on the largest players, then I think that just opens the opportunity wider for companies like PDD.

JA: Yeah, absolutely Tom. I think it's a great thing to emphasize, and we've also seen that with Bytedance and Meituan at various stages of their existence to haven’t we?

SH: There's another Chinese question here that I think could be quite interesting as well from a portfolio construction perspective. You have enjoyed a great deal of both volatility and success in some newer Chinese companies. NIO is one that springs to mind, up 30 fold in the last 12 months. How do you calibrate these big gyrations in context of the long-term opportunity for a stock like that?

JA: So should I start Tom? So whether it be in China or elsewhere, whether it be with such dramatic sagas or less dramatic ones, what we do in all cases is that we will have multiple scenarios for companies. You know, one of our biggest disagreements with standard fund management is that we don't think a company has an intrinsic value and we don't think it has one path of development, so we will have at least four different scenarios associated with outcomes in terms of share price that we structure and we will combine looking at the probabilities of those happening with thought process about where we are along which path the company takes. You have to have that dynamism in in what you're doing. So I would absolutely agree that at one point NIO was in severe danger. Now, It was always a possibility the Chinese state would back them and give them that application of capital. That's what happened on a regional basis. Now I think excitingly what's happened since then is NIO has gone from being one amongst very many, arguably, over 100 different Chinese electric vehicle companies, to being pretty much the clear leader.

Now what you apply and thoughts of valuation and potential outcomes is very different under that environment. So I would just stress that we can't have, and I know this has come up in various other questions, a static price target. The world is much more complex, and dare I say it, much more exciting than that.

TS: Just to add to that, with a specific and then a more general point, the importance of founders where you believe in what they're trying to achieve, you believe in their integrity and the mission, if you like. So one of the important factors for us, when NIO is going through some of its dark days, was that William Lee was still there, was still engaged, was putting more of his own capital into the business to ensure it got through that period.

And broadening that out, lots of people say their long-term investors, but then when you look at their turnover statistics, it doesn't back up that claim. And why? It's because if you're a long-term investor, things go wrong. Forget trying to be clever and buying at the bottom of the dips. But simply enduring through those periods where things are going wrong can be extremely difficult. There have been more than 10 occasions in our ownership of Tesla, where the stock price has dipped over 30 per cent, and there's a pressure that comes with that, so it's what things do you look to simply to endure the inevitable dark days that you're going to face?

And in the specifics of NIO, it came back quite strongly to William Lee, his commitment, and his preparedness to put more capital into what he was doing.

JA: It's a great point Tom and very similar to what Elon did in a time of crisis in Tesla as we wasn't it?

SH: When talking about some challenging days, we have a number of questions regarding coronavirus. I've got one here, 'A number of healthcare CEOs are suggesting that we will need to live with Covid for a very long time and perhaps forever. Do you agree with this and how does this affect your investment approach and your considerations of which companies will benefit most from here?

TS: I think the answer to that question is not one that the questioner should seek from us. You know, I think there's a dreadful temptation for investors to believe that they are experts in areas that they really should leave well alone and so epidemiology and the likely evolution of the virus is not something that you should ask us about. Instead, from an investment standpoint, what we're focusing on is: 'Can you find robust companies both in terms of their own balance sheet but also in terms of their financial model, run by entrepreneurs for very long periods of time that we think address big opportunities?' and if we're successful in doing that, then those companies will deal with the conditions that are thrown at them. Be that a persistent environment where Covid hangs around. Or, you know whether it's economic troubles or it's trade troubles. You have to allow these entrepreneurs to get on with it, but just doing our bit to ensure they're in as robust a position financially as possible to deal with that.

JA: Yeah, I can't resist the brief comment. It's not that they just shouldn't ask us. I don't know that they should even ask epidemiologists. My friends at Johns Hopkins are absolutely disciplined about saying 'We aren't projecting where this is going. We're just trying to observe what's going on.' And you know, the question may have been referring to comments of Stephane Bancel, that of Moderna last night on this topic. And I think all he was doing was raising that possibility. So, you know, we certainly can't answer it, but I'm not sure anybody can.

SH: James, I'll come to you, there's a question for you. ‘You have often spoken about concerns of US social and Western political stability in the past, very much in line with recent events. How does this affect your long-term investment thoughts? And as an extension of that, how important has the overt politicisationof Big Tech been in the last week? Does it compromise or change their historic business models?

JA: Yeah, sadly I think that projection, that concern, has been confirmed. I can assure you that when I say these things in America, it doesn't get out very well, but nonetheless it is that. I think we are in a race between this extraordinary innovative production and social breakdown, and I think it's when politics turns into societal problems that matters. What we need to get back is in the track of building out these technologies, and I think what Tom was saying earlier about EVs and transport is just an example of what we need to do to drag our societies back in it in a more profitable direction and prosperous direction for all. I think the question, the observation, about where Big Tech got to is absolutely right, and I think this has taken a big step change recently. If you observe the portfolio, I think it's something that's been sort of quietly going on, but really only Amazon is an important part of our portfolio longer, and I think you would agree it's not quite at the immediate forefront of these issues, so our exposure is very different.

But I think we are in a very uncomfortable world, where the power of these companies is now become so acute, that they cannot escape being involved in these issues. And I think the answers from country to country will vary. I was very struck by the response with Angela Merkel to what's gone on in America. So you know, that is absolutely right. These companies are now so critical,
they will be involved in these questions. I don't think that's always a downside for the stock, but I think it's going to be permanently present for the next decade.

SH: We've also had a couple more questions about end of carbon and it's ‘Can you give some other examples of holdings that are tied into this ‘end of carbon’ thesis in the clean energy space that fit your investment process, aside from Tesla and North Volt’. Perhaps some of the new names?

TS: So I pick out one that is not technically in the portfolio yet, but I think is quite an interesting business to think about and this is the world's largest EV charging network ChargePoint. So we have made a commitment to invest in that business when it lists in the next month or two.
And what's really interesting to me about that, and it possibly draws out one or two of the important points about investing in this area, is that this business is an EV charging network, but it doesn't sell energy, it sells the equipment that's needed to charge an electric vehicle and it sells the software to manage that process.

Now, if you are a corporate that is installing some EV charging points for your staff today and then you will perhaps by a handful of these pieces of equipment and then you'll pay the ongoing software rental fee and the maintenance fee. But it's the ultimate ‘land and expand’ if you like.
If the EV as a proportion of the global vehicle fleet is going to soar over the next decade or two, you're not going to go to a new provider of charging infrastructure because this is an issue you don't really want to manage, and so you simply add more and more of these points. You pay more and more of the software rental fees, and I think there's a really interesting business model there. It's very dominant in the US. And the challenge of the next five or six years is to build that infrastructure out in in Europe.

SH: We have been asked a number of questions about Tesla, really an update on where the position sizes got to, but I think there are some others really around the behavioral or practical challenges of reducing as a sizable shareholder.

TS: On the practical one, this is one of the largest and most liquid companies in the world, so there are no practical hurdles to changing the position size at all.

I think in the behavioral ones. There have been behavioral challenges with investing in Tesla ever since 2013 when we bought it originally, and I think the way we deal with it is sticking to process.
Having a clear idea of what it is that we find attractive about the company, where we see the opportunity, how we see the likelihood to capitalize, and then you simply judge events based on, you know, has the scale of the opportunity increased or decreased? Has the likelihood of capitalizing on that opportunity increased or decreased? And how did those factors play out relative to the stock price?

And so, getting away from the headlines, getting away from the hysteria, trying to be aware of your own behavioral challenges and thinking through these issues and focus on process.

JA: I would just say that I think Tom’s being modest there. Or perhaps I'm being arrogant. But you know, I think it's been really important that it has been the two of us connecting on this. I think both internally and externally you need To avoid as much noise as possible, Tom, don't you? And I think the fact that we can have conversations about this where we go through what you're saying there and we can give each other our own nuances and what's going on has been important, so you know, I think there is something about decision making there which has been critical. I notice that quite a lot of the questions refer to other groups in Baillie Gifford. The practical facts are that we don't tend to engage all that much with other people's views on it. We engage with the company and we engage with each other.

SH: There are quite a few questions around knew investment themes or areas such as technology such as hydrogen, quantum computing, cybersecurity, and how do you assess these very early stage opportunities in thinking about the long-term winners?

TS: Again, this is a process question in part. If you own a relatively concentrated portfolio and you don't change the names that you own on a sort of very rapidly moving cycle, then I think it allows you to get deep into the interesting areas that you think have the potential for growth. James touched on it earlier. Find the interesting academic sources in these areas. Find the interesting authors.

It's not about this shallow, broad coverage of what the biggest companies are saying every 12 weeks. It's about this search for the areas you think are most promising. But the next step, and a crucial one, is finding companies, finding entrepreneurs who have interesting business models, have a vision, and then backing the way they go about exploiting those opportunities.

And so the examples cited are all interesting areas, but the key for us is, can you find a company of scale which is on some way to proving a business model, which is run by people you trust? It's from that point that you can start to deploy significant assets in it.

If you look at one, for example that’s now maybe 5 or 10 years old in cryptocurrency and blockchain. There are some interesting technologies in there. There are lots of smart people working on these areas. There's a lot of investment that's gone in, but for us, what we're looking for is investable companies run by people that we trust. That's when you start to deploy capital, rather than because we have some vision of what's going to happen, or we think we should be the experts in these areas.

JA: I think there's something really important here Tom though isn't there in terms of the improving. I think both of us, if with slightly different emphasis, were very worried two or three years ago that the bottom half of our portfolio in terms of size, was not succeeding in either share price or business wants. But as that bottom half has become private companies and doing precisely what you say of starting small and gradually building up the relationships and the knowledge as the technologies move on, I think it's become a very promising field. You go back to an example or I was using right at the start. Well, a year ago we probably had 20 or 30 million dollars invested in a firm rather than the hundreds of millions that we find ourselves with today. The same with. Tempus as another one, so and so you know, I think it's led to a structural improvement in how the smaller holdings in our portfolio contributing both to outcomes and to building knowledge for the future.

SH: And how do you allocate your time in keeping on top of a number of these small Holdings? We've had a couple of questions around that.

TS: I think part of the answer to that question is this point around turnover - that we have smaller holdings but we don't change them very often and we place great emphasis on the value of building relationships. These are people operating in really interesting areas so it's not a chore to keep on top of them, in fact, it's a learning process that you get great value from.

I think the other structural point is that we, Baillie Gifford, have been investing in our capabilities in this area and we have a dedicated team to which we've been adding resource both in Edinburgh but also in the US. And part of the emphasis there is on building our capability and maintaining these relationships. So not just promising younger analysts coming through, but individuals who can relate to some of the companies, some of the entrepreneurs on their terms, because we think that's a tremendous source of value. So building structurally on that to make sure we're maximizing the use of that opportunity is really important.

JA: Yes, without us in any way opting out. I think we absolutely want to stick to commitment that either or both Tom or I will have connections with all of the individual companies here and it's important we do, but just to put some names on what Tom was talking about. Because they're not ones that come up very often partly because they don't necessarily run trusts of their own, but I mentioned Linda in China earlier, Lawrence Burns, who I've done a lot of work with in Europe, is somebody who's been enormously valuable in building this relationship and engaging with companies and Peter Singlehurst who leads our private company endeavors from Edinburgh, and his colleagues can share the responsibilities on that, but I would just go back to stressing Stewart that it's critical Tom and I provide leadership on this.

SH: I have a question here about the companies at the other end of the portfolio, so you've talked about some very exciting new opportunities in the very early stages of addressing huge opportunities. Are there any holdings that are perhaps closer to the end of their addressable opportunity in terms of upside from here?

JA: I think we'd say yes to that. We were entirely cognisant, and had this question come up in the past, we would have emphasized the dangers in interrupting compounding. It's a very small number of companies. We endlessly talk about the return and giving up on them is a very dangerous thing to do.

But you know, providing the hard-cold process analysis that Tom's been talking about and checking that there is still up does matter, and I think this has occurred in quite a lot of companies where 2020, for sad reasons, did accelerate developments rather than enlarge the opportunity set. So please don't suggest in any way that we're about to exit Amazon, but it is something that we think the opportunity set has not carried on increasing to the degree to which the share price increased. So yes, we have done a certain amount of those. I've already alluded to the fact that we you won't find Facebook and Google in our portfolio in the way you did in the past. Sometimes we're too early about this, so we need to be aware of that.

We did this exercise very formally with Apple, 3 or 4 years ago and we were way too early so we won't always be right. But yes, I think it's fair to say that there are more that are reaching that. Fortunately, as I hope we've conveyed, there are many more opportunities coming up, so we know, in Stewarts terms, we’re still seeing competition for capital, but some are getting to day two as Jeff would put it.

TS: I think there is a really important point in there about low turnover and no turnover being different things and for me, it is the driver of sales that is the pipeline of ideas. James said ‘competition of capital’ towards the end of his comments and there are some holdings that one time or another have been quite large that we've sold this year. Google, Facebook, you touched on Trip, the Chinese travel agent business and previously SEATrip, Inditex, the owners of Zara and Slack, the business communication tool.

So having no turnover does not mean that we won't sell things, but that tends to be driven by the pipeline of new ideas. You come into the office every day and you could sell these things, but you choose not to, except where you have a better idea where you think the risk adjusted upside over the next 5 or 10 years is higher. And that's being the really encouraging thing that there are these ideas coming into the portfolio.

SH: We're nearing the end of our allotted 75 minutes and we have had some questions around the allocation to private companies. So just as a reminder, that's 30 per cent at the time of investment. I think one of the quite interesting things about the portfolio is that we now have about 40 per cent of the portfolio that were first bought when being private companies. So I wonder if each of you could perhaps just give us some concluding remarks on your views on upside from here. But also how that private company allocation might evolve.

TS: Well, I think the change for us in the past 18 months, maybe two years, is getting away from thinking too much about the distinction between private and public. If you think about the evolution, the private companies is an area that we've explored, that we've developed our capabilities in, and that we've developed our resource is in. And I think having gone full circle on that, we come back to the aim of what we're trying to do which is own the world's most promising growth companies for long periods of time so that the wealth creation accrues to our shareholders. And that's irrespective of whether these companies are listed on stock markets or not.

So the private area continues to be a really important source of ideas for us, but we don't worry about the relative too much anymore.

And I think on the other part of your question about upside from here, it’s continuing to be disciplined about testing the outside in our existing holdings. And being in the really fortunate position of testing that against a pipeline of opportunities which are coming from just an ever-broadening pool of industries, of potential addressable markets, we touched on healthcare, we've touched on transport, we touched on energy. But there are all sorts of other pieces that are coming together in the portfolio where again we're seeing entrepreneurs with large amounts of their own capital tied up in the business, going after business models which have the potential to be really attractive.

It remains a phenomenal time to be a growth investor and amidst all the sort of conversations about levels of stock markets or happens from here, for us, it's focusing on that engine of wealth creation and an whether you can find those companies to invest in, that's absolutely crucial.

SH: James, any final comments from you?

JA: Well, I think Tom lived up to my expectations. There's just one sentence in a slightly different way, but I think the same thing, which is that if we can help and loyal support great business leaders with huge business opportunities in front of them, the outcomes will tend to look after themselves.

SH: That sounds like a great place to end, so thank you very much to everybody for your time and diving in today. If you would like some more information, please do visit the Scottish Mortgage website www.scottishmortgageit.com or get in touch with your Baillie Gifford contact. Until next time, thank you very much and goodbye.

Scottish Mortgage Annual Past Performance To 31 December each year (%)

	2016	2017	2018	2019	2020
Shareprice	16.5	41.1	4.6	24.8	110.5
Benchmark*	29.6	13.8	-3.4	22.3	13.0

Source: Morningstar, FTSE, total return in sterling
* FTSE AI-World Index

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