EMBRACING THE EXTRAORDINARY: IN CONVERSATION WITH THE SCOTTISH MORTGAGE MANAGERS

Join investment specialist Claire Shaw as she speaks to James Anderson, Tom Slater, and Lawrence Burns in the first-ever investor event with all three Scottish Mortgage managers. With no shortage of exciting growth opportunities, the Scottish Mortgage managers discuss the potential for exponential growth in the future. Join them as they look to companies that are helping to facilitate a post-carbon world, revolutionising healthcare, and accelerating the ongoing digitalisation of the economy.

Claire Shaw (CS): Good afternoon, everyone, and thank you very much for joining us today for this Scottish Mortgage webinar. My name is Claire Shaw and I'm an investment specialist on the Scottish Mortgage team. I'm delighted today to be joined for the first ever live event with not one but all three managers of the trust, so a very warm welcome to James Anderson, Lawrence Burns and Tom Slater.

Moving on to the agenda for today, we're going to maybe spend the next 40 minutes or so posing the questions to James, Lawrence and Tom that many of you submitted in advance, so thank you to those that took the time to do that. We'll then leave the last 20 minutes or so for webinar where you'll have the opportunity to have your questions answered live. So if you want to use the Q&A function in Zoom, we will endeavour to get through as many of them as time permits.

So by means of an introduction, we have titled today's discussion Embracing The Extraordinary. The inspiration for this was taken from our recent quote by the chairman of Moderna, a company that needs no introduction after the last 12 months, and he said that you have to be willing to embrace unreasonable propositions and unreasonable people in order to make those extraordinary findings, and I think this really struck a chord with the philosophy that sits at the heart of Scottish Mortgage.

So, Lawrence, if you don't mind, I'm going to put you on the spot and come to you first on this. You've often said that in our quest to find these extraordinary companies you would much rather endure drawdowns and disappointments than abandon our backing for these great entrepreneurs and these great companies. So just how important has this mentality been in the context of the last 12 months where we have had this extreme volatility and uncertainty?

Lawrence Burns (LB): Yes, thank you. I think it's critical and I think it's not just critical over the last 12 months but much longer periods that markets are volatile and companies' progress is rarely a straight line, even for great companies. If you look back at what's contributed to Scottish Mortgage's performance, most of our best performing companies have all had drawdowns, maximum drawdowns of around 40%.

Tesla was bought in 2013 for the trust. I think it experienced over ten drawdowns of 30%. So I think the first point is just all companies and even great companies go through these periods and I think that shows the importance of remaining with a long-term mindset and just continually being focused on what the five to ten-year possibilities are.

I think relaying it back, looking to back extraordinary people and extraordinary companies, I think the key thing we have to remember, the greatest cost to our shareholders is giving up on these extraordinary companies because they're what offers the really huge returns and they're worth backing through these difficult periods. Now, they don't always work out, but the key point is that in market returns this is just a very common feature, that you'll have these difficult periods.

CS: Absolutely. Then maybe just picking up on something you said there, Lawrence, and, James, maybe I'll pose this question to you. It was something that one of our shareholders wrote in with which was, when we're looking for these extraordinary founders, you put a lot of significance on founder owners of businesses. But over the last 12 months we have seen a number of these step back, so Jeff Bezos of Amazon, Jack Ma in Alibaba. So one of the questions that we had in is, how has this really affected your thinking on these companies? Has it changed your engagement at all?

James Anderson (JA): I can give you a one-word answer. Yes, it has to. But, Claire, I think it's very important that one shouldn't have a generic answer to it. If you look at the past record of companies, it's profoundly different about whether their success endures or not after the exit of the core founder, genius, whatever. Apple being an obvious example where it seems to have endured quite a long period, longer than we would've suspected. But you could look at other companies in the same industry, such as Sony, where it didn't endure at all.

I think it also is dependent, if you like, on how the company has thought about this in advance. Now, as a couple of recent books have made very clear in extremely fine descriptions, yes, Bezos has been absolutely, absolutely crucial to most of the big decisions taken inside Amazon. I'm not sure, Tom, that we would imagine that they would've been taken without him. But equally there is a very identifiable process and culture which will be left there as a style of doing.

In Amazon's case and Amazon's language, I think Bezos no longer being there means that this isn't day one any longer, but it may not be day 10,000 or day two or three and that makes a difference to how we think about it and the size of the holding we should have against that background. In a sense, Alibaba is an even more extreme example because their philosophy, and I actually chatted to Joe Tsai about this quite recently but it was also one that Tom went with through them when we first owned Alibaba before it's a public company.

Whilst you couldn't expect the same person to be able to move through, and particularly in technology driven businesses you should be prepared to have a different generation take charge, and their partnership structure enables them to move on and I think will get them through this otherwise very uncomfortable period that, if you like, the triggers for Jack Ma's almost complete disappearance from the company. So, absolutely, yes, it does make a difference, to go back to the original point, but we cannot have an absolute template for how it makes a difference.

CS: Interesting. Maybe just picking up on I guess extraordinary founders and, Lawrence, you alluded to this at the beginning in terms of Tesla and just the number of drawdowns it has. It's probably safe to say that Tesla's undergone a bit of a 180 over the last year in terms of what was once a very hostile investment and media community are now starting to realise the benefits that Tesla can actually add to society.

Tom, we've had a number of questions that came in around the same theme which was, obviously now it's been widely reported that we've sold approximately 80% of our Tesla holdings. But the question was really around, how did you reinvest those proceeds and also where are you finding ideas around this post carbon economy that I know James and yourself have talked about in the past?

TS: Yes, so we have sold a significant number of the shares in Tesla that we owned. That's partly a function of ensuring appropriate diversity in the fund and then with some of the increases that we saw at the tail end of last year around the company entering the S&P 500 index and splitting its shares. We come back to this discipline of asking, how do we make five times our money from this starting point and how likely do we think that is, and then that drove some further reductions.

It's actually an unusual example for us because usually it's the purchases that drive the sales. It's, where do we find the resources to fund the new idea, and it's that competition for capital which is a really important dynamic in the portfolio. In this instance, the moves in Tesla share price have been so dramatic that it was pushing us maybe to move a bit faster than that. But the good news was that there were so many things that we wanted to add to through the course of last year, and what seems really interesting to me at the moment is just how widespread and rapid growth is.

You can see that some of the large holdings, companies like ASML or Illumina growing at 30%. You can see it in some of the Chinese companies where revenue growth is more like 60% at the moment, or you can see it in, we've mentioned Moderna, but maybe something like Zoom, some of these companies that are driving the big changes that we're seeing or empowering the big changes we're seeing in society at the moment that are growing over 100%. So there's this abundance of growth, so it was not a particularly challenging task actually to find companies that we wanted to reinvest those proceeds into.

CS: Okay, and maybe just following on from that, James, I think you said maybe about this time last year that you proclaimed that this was the end of the carbon age. I think at that point one of our shareholders mentioned that you said that the opportunities that you saw were very much in the private sphere, you were struggling to find any opportunities in the public market. So over the last year we've obviously added Northvolt and ChargePoint, so maybe it would just be worth elaborating on those two names in the portfolio context.

JA: Yes, and if I may, Claire, and you know this is how we go about things, perhaps a bit of a conversation, I don't mean debate or disagreement, with Tom about this. I think we're way underestimating the sheer scale and the sheer beneficial scale of what is going on in the energy world. We mused about this before and perhaps it was very early on, but I genuinely believe that the best way of thinking about it is to believe that energy will be as free as search on the internet or whatever other aspect of the digital economy you want to talk about.

I think that is such a profound change from a cumulated set of philosophies that have grown up since the first oil crisis and the impact of not having the perennial, the oil price going up as inflation or economic activity and productivity goes down, I think is being way underestimated. I think you should go back to material written in the 19th century when energy first seemed to be unlimited and non-damaging in that way.

The next reflection would be, I really don't know what are going to turn out to be the best eventual beneficiaries of this and I think it's worth spending a minute or two of the audience's valuable time on this. So I think one of the most powerful statements Jeff Bezos ever made was, which is quite something, was when he said in the early days of Amazon, there's this weirdness about our business, everything gets better and cheaper, usually by around 50% per annum.

Then he paused and said, I don't know where that will take us, but I know it's going to be exciting. I think that's the attitude of mind we need to have at this point because there will be so many second round effects that we cannot imagine at this point, but it is incredibly exciting. It's not simply however important it is a climate change mitigation, it is opening up a set of opportunities that simply didn't exist otherwise.

Now, I think there is thereby a requirement to do some quite heavy buildout and actually both the two companies, Northvolt and ChargePoint you mentioned, are really involved in that, aren't they? It's the follow-on investment. But I don't think these are commodity type businesses at all and in particular I would point to a couple of ones on the Northvolt really which are very much on my mind. The first one is, why in the name of God or Gods, whatever you prefer, is this not happening in Britain?

It was basically the idea of a Swedish venture capitalist who's now moved on to try and inculcate Green Steel, so a minor adaptation to the world, and for sure he needed great help, an ex-Tesla executive as we were chatting about before. But I think the whole aspect of there needing to be regional capacities in these areas is I think the pattern that we're going to face. There will not be global networks of suppliers. In all likelier than this there will be local ones and I think that's going to be very important in whole buildout. But, please, it's just so exciting and so important for the next ten years. It will go well beyond these two.

CS: Absolutely. Maybe just, Lawrence, coming to you, I think Northvolt is probably a good example of how we're thinking about climate change and that broader maybe ESG space and I know that we're very much not of the mindset of ESG mantras and box-ticking exercises. I know, James, we were talking a few weeks ago and you used the phrase about, we're trying to tilt the odds of success in the favour of our companies, and Northvolt is probably a great example of that. We want to make that actual difference.

So maybe, Lawrence, I'll pose to you, our approach to ESG, if you like, is quite different and that has been picked up from our shareholders, so why is that the case do you think? Why do you think our approach to governance and ESG is quite different to the masses today?

LB: I think there's probably two reasons. I think the first reason is I think we've always seen ESG as something not separate from investment but very interlinked to trying to work out what are the future possible states for companies on a five and ten-year time horizon and realising that companies don't operate in a vacuum. They operate in symbiosis with society and their environment and we need to understand those interactions and what they might mean for the future.

I think the other way in which we probably think about it a bit differently as well within that is we're less interested in the past and more interested in the future. So it's how companies can change the world that matters, it's not what they're doing at the moment. I think the final thing I'd probably say is that I think we also want to be quite cognisant of not just focusing on the impacts of companies, but also the impacts of us as fund managers.

I think that goes to the point of how we can play a small role in tilting the odds of success in favour because companies need long-term support of shareholders that back them to do long-term ambitious things, to take calculated risks and often need the provision of primary capital. We have provided capital to firms that have gone on, Tesla would be one example, there would be others, to do things which I think are beneficial for society at points where they would have struggled or maybe found it more difficult to raise that capital. I think that's a responsibility of the financial markets, to make sure we're supporting companies to develop and improve our society in the long run.

CS: Yes, absolutely and I know, James, that's what you alluded to. That's probably what you're most proud of in terms of this context, where we can make a real difference to these companies.

JA: Absolutely. Of course we're in no way claiming that Tesla's success is because of us, but it's somewhat shattering to remember that we were basically for quite a long period of time, Claire, the only major institutional shareholder of Tesla in the world. The other couple of people had opted out. I think that it's really important that we manage to convey somehow in a much stronger method than we've/I've failed to do so, so far, that the number of companies that can make a real difference to the societal outcome is tiny.

It is, if you like, a subset of that very small number of companies that can actually have an impact on returns. So it's a vanishingly small number, but we need to regard those with enormous respect, affection and protection.

CS: Absolutely. As you say, it's that willingness to be unpopular, isn't it, and trying to find these extraordinary companies.

JA: Yes, it is.

CS: It's uncomfortable at times, I'm sure.

JA: I hope it's not a coming up to retirement cheap shot, but the two companies that we've been questioned most on of the year are Tesla and Amazon. I'm not sure that that's turned out to be a great topic in the past.

CS: Indeed. Maybe just changing tact slightly, Tom, a number of shareholders commented on and picked up on something you said in your manager's report and it was in the context of what is very en vogue at the moment which is SPACs, or special purpose acquisition vehicles. I think you mentioned that you were quite sceptical about our flying taxi companies, Joby and Lilium, about whether this was actually the right structure for them going forward.

So we had a number of questions coming in which was, why in your opinion do you think staying private would've been a more favourable path? Then probably more interesting as well is, whereabouts are these companies in terms of becoming commercially operational?

TS: Well, I'd tie this slightly to some of the earlier questions. I think you were asking about founder managers and their importance, and to my mind the important thing about a founder manager… Or going back a level, the thing that we're looking for in a company is, what is it that enables it to think really long-term about the issues it's trying to address and relentlessly pursue those opportunities to the exclusion of the noise and pressures that will inevitably arise.

Founders of public companies have a special licence I think to look through that pressure from Wall Street and take decisions on a different timeframe. Now, that's not universally true and it doesn't have to be a founder, but it is often the case that having that founder manager presence allows companies to think on a different time horizon. Now, that's in public companies.

I think it is easier or potentially easier for private companies because you don't have that breadth of external shareholders. You don't have the Wall Street analysts. You don't have the quarterly earnings regime. Now, it does, though, depend on who your shareholders are. Have you got the right set of shareholders to back you in pursuing that long-term vision? How much of your own destiny have you retained?

So when you look at what's been happening recently and the provision of this aggressive pursuit of companies to move public through the SPAC structure, the questions for me are, when you get to public markets, are you ready for the environment you're going to find yourself in? If your share price drops 50%, what are you going to be talking about? How are you going to be explaining the business to people? What are the floors under the share price? What is it that's going to stop the business crumbling in that environment? I think that equation is different for all companies.

You talked about Joby and Lilium, the flying car companies, and the calculus for them I think is that getting to the point of launching these services commercially is expensive. You have to go through the Federal Aviation Authority's certification process. It's rightly a long, arduous, expensive thing to do and so what these… As these companies have looked at the set of issues is, with a SPAC, with these fundraising structures, I can get a lot of money onto my balance sheet today. Then they're saying they're going to prioritise that and having that funding secured to get them through this next stage.

What they're sacrificing in doing that is that they don't have a predictable business model. They don't really have revenues. They're going to likely have further ongoing funding requirements and so what are they going to point to, to public market investors to demonstrate progress? If you encounter a much more difficult funding environment, how are they going to deal with the stresses that come with that? To my mind, it would be easier to deal with some of those things as a private company than it will be to do in the public markets.

CS: Absolutely. I think maybe just another in a similar field, the other company that we had questions come in on was on Ginkgo Bioworks, which has obviously been quite high profile over the last month or so. James, I know this field of synthetic biology is one that you're mentally excited about as well, so how do you view where Ginkgo is in its stage of development versus a Joby and Lilium in terms of that ability to be going public now?

JA: Well, I'm not sure that I'd put this in this way to Tom and Lawrence so you maybe want to see whether they react. But I would couple Ginkgo with Moderna and thereby into Illumina in that I think outside what we were previously talking about with renewable energy, what we're seeing is the process of software taking over the world is being applied to new industries.

In both these cases, really what the leaders of these companies would tell you is that it used to be said that neither pharmaceutical discovery, nor biotechnology and synthetic biology could be reduced to code, but they can and it's just a different code. I think that is transforming both those businesses, which is incredibly important in and of itself, but gives them two characteristics.

That as investment matters, and in ways separates them off from some of the ones that we've been talking about, because on the one hand you've got this process of exponential improvement and that morphs into the margin structure because as with so many digital business, it's the amount and pace of growing data that really, really matters.

So I think one of the frightening elements here is, and for sure we're further on with the

Moderna's of this world than with the Ginkgo's, but I think it's the same process. It may mean that early leadership really locks you into dominance fears to come, a phenomenon that in a way I think, Tom, we mentally thought of as more being associated just with the digital internet businesses, but I think it may apply to these absolutely critical areas and I think that is different from a Northvolt or a Joby or whatever.

TS: I totally agree with that and I think this process of accelerating the development of that code base is one that's really worth investing in. In the case of Ginkgo, we had a frank conversation with the founder, Jason Kelly, about his expectations of this process. We probably came down from a slightly different position on what we thought the ideal path forward was than he did, but I think the clear area of agreement was that whether they went through the IPO process or through the SPAC process, the aim should be to have that core of long-term owners in the register on a two or three-year view.

So how do you get to where you are as a private company to a public company with that top ten shareholder list that you want that will enable you to run the business in the way you want to? He had a clear idea of how he wanted to get there and we were happy to back him in going down that route.

CS: Yes, okay. Lawrence, I know that you came out with this great quote a couple of weeks ago which you said that was… Was it one of Steve Jobs' final predictions? Was it he said that there would be…? The meeting of biology and technology would foster the greatest innovations of the 21st century, so I guess Ginkgo is probably a company that would fall into that category.

LB: Yes, I think it is, and I think the big context is really applying things like Moore's Law and data which have been so transformative in industries like retail and advertising where we've got the Googles and the Facebooks and the Amazons of this world and then applying that on a canvas that's much more important, both in size and scale and to human outcomes as an area like biology and healthcare.

I think that is really driving some quite fundamental excitement because it can go in so many more different directions I think and impact people's lives in even more propound ways. So I think over the next ten, 15, 20 years trying to understand what that means and how that develops is something that's going to take up an awful lot of time.

I think the final point would just be I think what's interesting, picking up on James, if we're seeing some of the same patterns of the use of data and an element almost of network effects as well that might mean the economics looks a bit more like the digital business models of the past than the healthcare models of the past.

CS: Yes, absolutely. I guess despite the plethora of SPACs that we've seen, I guess the fact of the matter is that companies are staying private for longer. If we look at all the data, that would suggest that cultural norms amongst founders is such that they are wanting to stay private for longer. Lawrence, I'll maybe come back to you on this.

I think it's sometimes misunderstood where we feature in our private companies. We're not doing traditional venture cap. We're not doing private equity as such. What we're really trying to do is provide stage appropriate support. So we did have a number of questions come in which was, how much engagement do you have with the boards? How much operational support do you give companies or private companies and has that changed as a result of our size and scale?

LB: I think I'd see our primary role in the provision of private capital as being genuinely long-term, patient capital. I think there are number of different venture capitals that tend to get more involved at the board level in operational and day-to-day advice. I think our differentiation and advantage is that perhaps unlike some of those, we're wanting to invest without any particular stage of exit in mind. A number of

VCs, once a company goes public, they might sell within one to two years, where we would be more than happy to own it for a decade afterwards.

If you look in Scottish Mortgage, we've owned Meituan and Spotify for a number of years while they were private and we continue to own them today, very happily. I think what that gives, and it builds on Tom's point really, is it gives them stability in their shareholder register. They don't have the pressure to create liquidity events and refresh that investor list and that I think becomes particularly important when you're thinking about the next stage of a company and when you want to IPO.

I'd like to think one of our advantages is that we're completely agnostic whether they IPO in a year or two, or five years or ten years. The only thing we really care about is what's best for the long-term business to deliver that outcome for shareholders. So that agnosticism between private and public I think is quite helpful in the provision of capital in the private space.

CS: Absolutely. I guess following on from that, James, I know this is something that you are quite keen to emphasise from a Scottish Mortgage perspective, is the fact that we are agnostic to their status. We benefit from that compounding of returns because we're buying these companies at that lower starting value, whether it's a Spotify, HelloFresh, Meituan, whatever. Do you think that's an underappreciated advantage of Scottish Mortgage, that we really benefit from that long, round compounding?

JA: I do, and I hope you won't be surprised by this, Claire, but I think we have a got a lot further along this and many more lines of thought and much greater access than really we could've believed possible, Tom, when we started in this area. But I think it's utterly transforming what you can do on that, not just by the mechanical effects of where you are in the share price.

I think one of the very interesting things has been really, when Lawrence says we're stage agnostic, what that's come from is we want to know whether the process that we believe in can be applied to these companies. So very rarely are they gadget companies with a dream. We put them through the same process effectively as elsewhere.

But I don't think I'm any longer quite agnostic and I think one of the critical elements, and it spins off what Tom was saying for sure but perhaps put it in a slightly different way, is that I think by and large the quality of ownership that you have in the private world is far, far better. I said to somebody yesterday that I think in a way we've had to make as a society, as an industry venture capital more important because equity markets are not doing the job they were originally designed for. This is why we do it.

But the last point, and it was absolutely brilliantly encapsulated by some of the companies that Lawrence was mentioning as an example of that, it is the relationships and knowledge that we have when these companies are private that should endure. Spotify being one that very much comes to my mind on that score and I think that is profoundly important. If I put all this together, I can't see how in the future capitalism and investment firms can exist without doing this. To me, it is so central that I think it is the driving force of how we should think about the world.

CS: You've read the mind of our shareholders here, James, because we had a question come in there live saying, do you think even more attention should be paid to this area by the wider fund management industry, and the answer is there obviously.

JA: Totally. I've talked quite a lot, but just a sentence on it. I think it's going to be very hard for some people to reinvent this in a way because all those habits of quarterly calls of concern about volatility, etc, that we've gone through are so engrained in so many fund management institutions that I don't really see that having as great appeal to folks and the visionary owners and founders of these companies.

CS: I can imagine. Then just maybe moving tact slightly. You won't be too surprised that we had a lot of questions come in on China, particularly around the well documented tensions, so maybe just a broad question to start. Tom, I'll maybe come to you on this. How confident are you on the outlook for China?

TS: Well, I guess the outlook for China is so broad a topic as to encompass almost anything that I wanted to talk about. I think what I would focus in on is that the companies that we see in China, the entrepreneurship at scale is getting to the point of almost being unique anywhere in the world that you… First of all, you have this huge domestic market opportunity and then cutthroat competition whenever a new idea or a new model emerges.

The companies that emerge from that vicious competition in that huge market are battle-hardened with leaders who really have a vision of what they're trying to achieve and generally to win at scale they have a clear path of where they want to go to next. So despite the dominance of the giants, Alibaba and Tencent, we've had a new generation of entrepreneurs coming through that are able to keep innovating and keep scaling.

That is the part of what's going on in China that makes it so attractive to us, that you see these companies coming through with a real drive and vision for where they're going, whether that's ByteDance or Meituan or PDD. I think we've had the launch of Full Truck Alliance IPO this week, another private company that we've backed in China that's coming through. But at the same time the giants are also continuing to grow rapidly.

I think one of the really underappreciated aspects of Tencent, for example, is their skills as investors. The track record that they've had in building this portfolio of investments that's worth probably around $200 billion, if not more, today is frankly quite astonishing when they've been, at the same time, getting on with their day job of managing this rapidly growing consumer facing empire.

So we can talk about the macroeconomics, although I'm not sure there's a great deal of value in that. We can talk about the political tensions but, again, these things are very, very hard to make sensible investment judgements about. So bring it back to the companies and the entrepreneurship and that's what makes us so bullish about the opportunity there.

CS: Absolutely. Maybe just following on from that then, Tom, I know obviously Tencent is now, give or take, the largest position in the trust today. Lawrence, I think it was the beginning of the year or later last year that you met with Martin Lau of Tencent and it's just maybe interesting just to maybe spend a bit of time on, how have they navigated the difficult regulatory backdrop and how well are they executing in their core business when you compare it to the issues of Alibaba and that?

LB: Yes, I think the first point would just be that there's always been a regulatory backdrop for them to navigate. The short memories of markets, 2018 they came under a lot of headlines around gaming regulation and licencing pausing on new games and certain restrictions coming on. They navigated that and are onto a firmer footing again and they're as optimistic as ever about the potential for gaming. So I think I'd put it in the wider context that this isn't the first regulatory challenge a number of these companies have had in China.

In terms of how they're navigating it, I think it's, and this would be a general one, I think, one, it's an attempt to have a constructive relationship with the government and, two, a realisation that they have to earn a social licence to exist and have to be in some ways moving society forward in terms of their actions. I think the third thing that particularly applies to Tencent is, and this goes to the point of them being really good investors, is that they've often invested in the likes of Meituan and others and helped/supported them with their ecosystem and really empowered other business models to go and achieve great things.

Which is I think both quite a fact that's appreciated within society, but also I think it's something I quite respect and admire because they've gone and looked at certain large areas where they don't have quite the right expertise but have backed others in those areas and supported them. I think that's been very admirable and of course created huge amounts of value for their shareholders.

CS: Absolutely. Maybe just one last question just to touch on China and maybe, James, I'll ask you this. How much do you think it's made a difference having on-the-ground research in China? Obviously you've always had very good relationships with the companies there, but do you feel that there's been a difference from having our own office now in Shanghai and the insights that we're now getting from having that on-the-ground presence?

JA: Absolutely and, as you know, I'm not of the view that all our equity investors in Baillie Gifford have really helped/contributed that much. There tends to be enough getting on with their own tasks. But what Linda Lin and partners have done in China has been truly remarkable and I think we are incredibly fortunate that we have someone who absolutely understands what we are trying to do, but at the same time can absolutely gain us trust and access from the Chinese companies, so hugely important and huge kudos to her. I'm sure she'd like to be here, but it's obviously difficult at the moment. Can I just…? A couple of things to add to the previous part very briefly.

CS: Yes.

JA: So one of the most vigorous questionings, Claire, that I've received on this topic of isn't China worrying was at a forum in America in the second week of January where concern about Chinese political upheavals was deeply set. You had to delicately remind them that there had been a coup in America the week before and I have to say I think there are quite big issues elsewhere from these points of view.

Secondly, can I put it in the context of now we're getting huge amounts of questions on China, it's not that I resent them or any of us resent them at all, I don't think they're serious matters, but let's link back. It feels a bit like the questioning of Tesla or Amazon at various phases and that is what gives you opportunities. You have to make the right judgements, but you also have to endure.

CS: Absolutely. Maybe just moving I guess a little bit closer to home in Europe. I thought there was an interesting question that actually came in which maybe alludes to a widely held belief that's maybe not entirely accurate, which was one shareholder asked, what's the rationale for holding Ferrari and Kering as they stand out from the other tech names that we hold?

Now, I wanted to say that we obviously are not a tech fund per se, but nevertheless I thought Ferrari and Kering we don't often talk about too much. But, yes, it'd just be interesting to hear your thoughts on the investment cases and the growth potential for those two names.

TS: I'll start on that one. Well, I'd first link it to the conversation about what enables a company to take decisions on the right timeframe and I think in both of these instances what you have are really, really valuable brands.

To develop and really maximize the opportunity set that comes from having those brands, they have to be exploited extremely patiently and developed over very long periods of time. In both instances, you have family ownership that creates the environment and facilitates that type of decision-making. So in these older companies you don't need a founder, but you are looking for another mechanism that unlocks that decision-making timeframe.

I think if you go back to the genesis of our investment in Ferrari, it was actually pre it's demerger and it came at a time when there was immense hostility to what was going on in Continental Europe. Everybody was forecasting the demise of the Euro and focused on these macroeconomic issues and ignoring an asset that we felt was the most valuable brand that existed.

If you then wind the clock forward, what we see at the company is this really thoughtful engagement with the technology and the changing picture of technology. It's not head in the sand, we make V8 engine supercars. But the brand is associated with technology and being cutting edge, etc, and this, again, just really thoughtful way about how you exploit and develop that position.

Kering, there is a similar picture, that the way that brand has been managed, the inspirational creative contribution that we've seen there, but allied with that, with Mr Pinault's people management and ability to manage that portfolio of brands. So we're looking for growth, we're looking for exceptional growth companies, not tech, as you talked about, exceptional growth. We're also open-minded to how rapidly the companies exploit that potential. These are companies which will exploit that potential over a longer period of time, but we think are vastly underappreciated by the market because of the duration of that growth opportunity.

CS: Absolutely. I guess, Tom, just on that, you talk about our desire to find exceptional growth companies. I think you maybe said in an interview at the beginning of the year that you thought AWS might actually be the most important company in the world. James, you have said this is ASML. So, Lawrence, I'm going to put you on the spot here. It's down to you to settle it. Just in terms of the importance of ASML, just be interesting just to hear your thoughts on this because I know it's one that you feel quite strongly about.

LB: I think it's interesting that we've got a company that isn't top of our headlines that comes from Eindhoven where few people go or recognise as a hub of technology and innovation. I think ASML is so foundational to the continuation of lots of the elements of change we've been talking about. So whether that's healthcare in Moderna, whether that's indeed AWS itself or some of the e-commerce companies or what we're seeing in China, it's played an absolutely critical role in allowing the continuation of Moore's Law through the development of EUV technology and I think it is a company that is doing some of the hardest things in the world.

Academics widely recognised their lithography machines to be the world's most complex machines. They require about two 747 Jumbo jets to be transported, cost several hundred million dollars. It's really cutting edge technology that's vital really I think for human progress. So I think it's a company that we're very glad to be shareholders of and close to for, apart from anything else, trying as best we can to gather what the roadmap is and the confidence for that continuing in the next decade and beyond.

CS: Do you think the implications for...? You've talked about the increasing computing power and if we extrapolate out Moore's Law, what does a 60 times increase in computing power over the next decade look like? Do you think people will find that hard to comprehend, what the implications are? James, maybe I'll come to you on that one.

JA: Claire, I'm not going to take that one up. I'm going to pass it back to Lawrence, but with the pre-emption, if I may, of it sounds like Lawrence agrees with me. That ASML is actually the foundation of this, AWS the exploiter. I was actually trumped by an American fund manager I admire recently. I was listening to one of his podcasts. He said that actually he thought ASML was responsible for most of human progress over the last 30 years. But on that question, Lawrence has honestly done a lot of thinking about that so I think it's fair to pass that back.

LB: Yes, I think the honest answer would be that a lot of the thinking has been about trying to frame that as the question rather than knowing the answer. I think you've got a Moore's Law, you've got a doubling every 18 to 24 months, you've got ASML saying they've got the roadmap out to 2030 and a little bit beyond, and so with a relatively unusual degree of conviction with this longstanding trend you can go, well, what does that mean?

Over the course of a year or two it doesn't mean a huge amount but, again, it's exponential growth. If it continues another two years after that 64, it's quite obvious that it's then into the triple digits of impact. I think one of the things that myself and James were talking about not so long ago was the idea that if 30 years ago you'd just gone, what are the implications for Moore's Law, it would've given you quite a lot of investment answers for where you should spend your time looking for growth and for change and for shareholder returns.

I think seeing that continue for the next decade is the question we've really got to grapple with and I think one of those answers is the continuing digitisation of our economy. Backing people that are doing interesting things and doing unreasonable things as well is a good place to start and I think the second is, as we've talked about, seeing that seep through into bigger industries that haven't been as touched by digital technology where healthcare and biology is pretty at the top of that agenda.

CS: Yes. No, absolutely. I think, is it Peter Wennink, he had a great quote in a meeting you had at the beginning of the year when he said that the only serious competition that ASML is facing is the law of physics, which really I think just gives you a sense of just their competitive position. So I'm not sure, Tom, on that basis, anything to add here?

TS: I think, though, that your question was quite an old-fashioned one about what might happen if Moore's Law continued for the next decade. If you look at the pace of development of machine learning, the cost to clients in training a machine learning model, just the scale of the models that are being used, both those trends are progressing far faster than Moore's Law at this point. Thinking through the implications of that might be even more interesting, so take an example from the portfolio.

We own shares in a company called Tempus and what they're doing is solving a huge data problem that exists in the healthcare industry of actually trying to get a proper catalogue of the physiology of patients' disease but then matching it against the genomic analysis of their disease. On the basis of having that full understanding of the underlying genetics of the illness and the patient's individual circumstances, they're then able to use machine learning on this vast dataset and actually start to suggest treatment pathways based on all the available data in a way that an individual physician just would simply be unable to do.

Now, that's already leading to better outcomes for patients. It can identify relevant clinical trials for that individual. It can look at the history of individuals with exactly the same physiology and see what treatments have led to the best outcomes. But imagine what they're going to be able to do ten years from now with the pace of progress in this technology. I think it'll leave Moore's Law looking very pedestrian.

JA: But it is presumably in some ways dependent on Moore's Law. But I think the Tempus one is so interesting, isn't it, that I think maybe worth a little bit more about that. So I think those underlying trends that Tom is talking about there are incredibly appealing, exciting, etc, and it always interested me that John Kay, our ex-director, who obviously we've benefitted hugely from his thoughts and experience, but John wasn't by and large an optimist.

But yet I remember very clearly when we first started getting very excited about this he looked at me and said, well, of course Moore's Law and associated technologies will start to affect healthcare, it was just a matter of time, so I think you've got that inevitability. But the part that I think is truly intriguing here and I'm not sure I'm going to be able to offer an answer, but why was it, Tom, that it was Tempus that appears to have a lead in this area?

Because this was recognised nirvana for many companies and many companies with a stronger starting point, whether in capital or scale, so it's adding to those exponential trends. Can you identify the teams, the cultures, the companies, the founders that are going to really be the winners in those areas that I think is the most exciting challenge of all.

CS: Absolutely. I promised we would leave some time for live questions and they have been coming in thick and fast as we've been talking, so let's just jump right to them. Maybe, Lawrence, I will start one for you which is, somebody's asked, there's huge parts of the world that are not represented in the portfolio, so India and Japan very little and Latin America. Why is this? Is it the fact that companies do not meet to your criteria or is it something more structural?

JA: Is the question from Sarah Whitley?

CS: Well, I didn't… The name's been taken off it, James, so I'll ask her afterwards.

LB: So I think in some ways I'd link this firstly back that there are hubs of innovation where I think we're doing great deals of learning and China is one of those in terms of business models with other companies and countries taking inspiration. The second would be we have indirect exposure to some of the countries mentioned. Amazon's operations in India are quite significant, as indeed there's a growing presence by some of the Chinese companies who are in those markets as well.

Then I think we've got Latin America. We own Mercado Libre, which we don't own much. It's the only company we own in Latin America, but I think it is probably by far the most significant because they're building out the infrastructure for retail with e-commerce but also the infrastructure for finance where they're broadening access to financial services that didn't exist before.

Then I think it's right that we need to start thinking about other parts of the world and making sure we're building up our domain knowledge so that as the right business models emerge, we can invest in them. So I've spent a lot of time over the last few years on the ground in India. My trip before COVID was supposed to be to Sub-Saharan Africa, so I think they're definitely areas that we're looking at and trying to make sure we build our networks and domain knowledge so that we can really apply it when the business models apply. So we have a number of investments there that will link, but I suspect that they'll grow over time. HDFC in India would be another one as well.

CS: Of course, yes. Then it'll come as no surprise, this next topic I guess. Tom, maybe I'll put this one in your direction. So Scottish Mortgage recently invested in Blockchain. Bitcoin clearly divides opinion as we know, particularly on ESG grounds. Could the managers please share their thinking on this?

TS: I think what is fascinating about Bitcoin and the associated technologies is the idea of digital scarcity, which is something that we haven't had hitherto and I think there are all sorts of interesting applications that follow from that. It's a technology which is still extremely young, but the barometer for me is, can you find companies run by really interesting entrepreneurs that are driving forward that vision and building out that opportunity?

Where you find them, you back them and you try to learn from them about that evolving position.

So this is an area that we've focused on and the investment in Blockchain.com is a small toehold in this area. Hopefully there'll be more opportunities because there are a lot of interesting people, interesting venture capitalists investing into it.

CS: Absolutely.

TS: Maybe just worth re-emphasising the point, we're not investing in Bitcoin the asset class at this point, it's companies that operate within that ecosystem.

CS: Yes, so financial infrastructure. James, somebody picked up on the fact that you obviously mentioned the UK and the innovative backdrop in the UK. It was obviously announced this morning that Wise or probably known as TransferWise is about to IPO. Somebody's asked, could the managers outline the investment case and how the listing might impact the company? I'm not sure who would like to take that one?

JA: Sure. We could all add elements of this, but I think it is a very interesting example of the plusses and minuses in the UK. There is this plethora of at least to some extent UK-based Fintech companies, but the challenge so far has been, as is the challenge of so many British companies, to scale that into global and genuinely significant levels. For us, the most important single feature of today's announcement is, and obviously we talked to the company about this, that they are determined to have differential voting rights, at least for a period of time.

To our mind, when you have a shareholder base that is perennially impatient that becomes even more important to establish in Britain than elsewhere. So I think we need to stand up for that absolutely and I'm sure there will be lots of critiques in the media over the next few days on that topic and we want to support the company in that. I think it's a fantastic service. It's helped me greatly. I should be able to get the shares as a customer as well as our ownership. But they are grasping the possibility of making this a global scale business. That's what we've got to anchor on trying to help.

CS: Absolutely. Maybe just in the interest of time, a final one here which is maybe a good one to finish on, which is somebody has asked, the managers like big winners in huge and growing markets. What is the next trillion-dollar industry that does not already exist? Tom, I'll come to you first, put you on the spot.

TS: I think talking about industries that don't exist has not really been the way that we have approached this. It's more been looking at opportunities, ways of doing things that are becoming obsolete in the face of new approaches and new technologies. So we've touched on healthcare, I think this intersection of information technology and healthcare is a trillion dollar opportunity.

We haven't talked about a great many of them, but the move towards clean and abundant energy combined with the electrification of the transport sector I think creates a whole other trillion dollar opportunity. We could go on because there's a number of these areas where you are just seeing these transformational changes, but you've got to allay that from an investment standpoint.

It's not sufficient to say, is it a big opportunity, but is there a company with a business model, approach, a culture that is hard for other to emulate? Because if you don't have that, then you don't get supernormal returns and you don't get the exceptional businesses that we invest in. So you can see plenty of changes or new opportunities without being able to make returns, so I think you have to bring it back to that individual entrepreneur company level.

CS: Lawrence, James, anything final to add on that point?

LB: I think I'd probably go back to what I centred on in the private areas. We talked about the opportunities in supporting companies, but I also think it's a great way to build one's knowledge because a lot of these companies that we're talking about as being the next generation in healthcare or energy, they're in the private space and it's through investing in them and engaging with the management teams that we're able to better understand, what are the possible trajectories for the future?

That has huge implications not just for the companies themselves, but also our existing public holdings. So I think it's that ability to have those, again, connections in both public and private that are very helpful in building a view of where to look for the next big industries or, as Tom really rightly said, the next founders and business models of the future.

JA: I think the process of change will accelerate, the scale of change will accelerate and I couldn't be happier that my colleagues, successors will have all these opportunities and I'm sure they will do a fantastic job in pursuing them. So I'll leave it at that.

CS: Great. Well, I guess on that note and in the interest of time, unfortunately we have to wrap up there. Apologies if we did not get through all the questions. There was a huge amount submitted, as you can imagine. If there is anything you'd like us to follow up on, then please do get in touch with your Baillie Gifford contact and we will endeavour to come back to you. So all that remains is for me to thank James, Lawrence and Tom for what's been a fascinating discussion and thank you very much at home for watching. A very good afternoon to you all.

Annual Past Performance to 30 June Each Year (Net %)

	2018	2019	2020	2021	2022
Scottish Mortgage Investment Trust	33.4	0.7	55.4	62.8	-46.1

Source: Morningstar, share price, total return, sterling.
Past performance is not a guide to future returns.

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