

The Apple-fication of Investing

Adam Bass (00:03):

This is MSCI your source for insights for global investors and access to research and expertise from across the investment industry. I'm your host, Adam Bass, and today is November 22nd 2023. Some of you may be listening to this episode on your iPhone that you've populated with your own collection of widgets, others on a PC with icons that are based on your five-year-old's drawings, or a smart speaker programmed to speak with the voice of Matthew McConaughey. In any case, to live in the world of 2023 is to know that nearly every experience can be personalized. Today we discuss how this concept has made its way into investment portfolios as well as wealth managers' business models, and how, for our three guests at least, this is all right, all right, all right.

Raina Oberoi (01:05):

Becoming more and more evident that personalized wealth management solutions are no longer a luxury but a necessity.

Adam Bass (01:14):

That's our first guest.

Raina Oberoi (01:16):

I'm Raina Oberoi, I head the equity solutions research team globally for MSCI with a focus on both the institutional and the wealth management space. Now, an individual may have a certain long-term objective post-retirement, may have certain lifestyle needs, cash flow requirements, and we have a view on investing or non-investing in certain types of companies. So by analyzing an investor's individual needs, preferences and risk tolerance, wealth managers can really create tailored investment portfolios that align with their client's goals.

Adam Bass (01:54):

Our second guest today built on this idea.

Manju Boraiah (01:58):

So my name is Manju Boraiah and I head the systematic fixed income and custom SMA investments at Allspring. If you look at how asset allocation has been done in the retail space, it's mostly through off-the-shelf models provided either by the wealth manager or asset managers that are comprised of mutual funds, ETFs, maybe some allocation to alts. So mutual funds or ETFs, as you know, are co-mingled funds where you're essentially buying a shared class of a structure, which in turn holds individual securities like stocks and bonds. Now, if you're looking at SMAs, they're different because you're essentially directly holding a portfolio that's comprised of individual securities. Because of that, you have certain advantages. One is you can customize your portfolio or personalize your portfolio based on certain characteristics or objectives. It could be driven by financial objectives like income or risk or credit quality and fixed income. And the other advantage is really tax efficiency.

Adam Bass (02:59):

Ah yes, taxes, one of the two certainties of life they say. Now they do play a major role in our conversation today, and so we will certainly talk about it, but not just yet. For now, let's keep going with the idea of how a personalized approach differs from what's typically been done, and we'll do so by bringing in our third guest and the idea of what's called direct indexing.

Joseph Wickremasinghe (03:30):

My name is Joseph Wickremasinghe, I'm part of the equity solutions research team at MSCI. More and more we're seeing that clients basically want to be able to invest according to their values and effect change with their investment dollars. Some investors might want to avoid energy, they might want to avoid controversial weapons, they might want to avoid other kind of commercial issues. And so with the personalized investment approach, you can build a portfolio that basically expresses your values and allocates your capital to only those companies that you want to finance and avoid those companies that you would rather avoid. If, for example, you have a very specific set of companies you want to avoid, you could do that with a direct index where you can say, "I want to basically track this particular index, but exclude one or two stocks." It gives you that level of granularity down to individual securities, which with the ETF infrastructure expanding, we are getting much, much more choice in ETF.

(04:38):

The challenge here is then understanding how well your return is doing, to be able to say, "Okay, given that I've made these investment decisions and expressing my preferences in a certain way, how can I come up with what is a reasonable return on my investment given those preferences?" This is kind of where we've come in with our custom indexes or the client-designed indexes where clients can now choose an index which then can serve as a benchmark for their investment portfolios. And that's kind of really why we're seeing or how we're wanting to be very granular in how they're allocating the money, but also having the ability to come up with essentially a personalized benchmark, a personalized reference rate of return that tells them, how am I doing relative to what is my market? What should I be expecting based on my investment?

Raina Oberoi (05:34):

A simple example that we are seeing a lot with our clients is the flexibility that direct indexing can provide for a US-based wealth manager who also wants the benefit of accessing international markets, but only wants to use US-listed companies to do that. So now they have the option to use an ADR universe or American depositary receipts universe that can easily help them create a personalized international portfolio of US stocks or what we call at MSCI a client design index. So essentially you're creating a portfolio using US-listed companies not having to worry about accessing international markets, or not having to worry of actually directly investing in international markets, but still have the benefit of accessing this group of securities internationally and perhaps creating more diversification in your portfolio and for your clients.

Manju Boraiah (06:28):

Direct indexing is really part of the SMA ecosystem, right? So within SMAs you have two categories of SMAs. You have the model-delivered SMAs and the manager-traded SMAs. Now in the model-delivered SMAs space, an asset manager like us would essentially deliver a model securities to a

wealth manager or to a platform. Essentially, they're replicating the model that's been provided to them and tracking that through time and evolving that through time. In the manager-traded SMAs space, you can actually have an asset manager like us manage the individual accounts, customize those accounts and manage them in a tax-efficient way through time within the manager-traded SMAs space.

Adam Bass (07:12):

Just hold on a little longer, Manju, I promise we will get to tax efficiency.

Manju Boraiah (07:19):

Direct indexing as a concept has been in existence for a while, and what it really means is that you are actually passively tracking an equity index while offering customizations based on either values or factors or themes or sometimes even tax preferences. You can't really track an index on fixed income because that's not feasible, especially in smaller accounts. But what we really can do is you can build a ladder portfolio which gives you exposure to the different parts of the yield curve in a structured way and track that through time.

Adam Bass (07:54):

Thank you very much for your patience, Manju, let's now please go ahead and add taxes to the equation.

Manju Boraiah (08:02):

I generally think about tax management in the concept of custom SMAs as a more holistic approach of managing tax consequences in the portfolio. So there are multiple ways of doing that, right? So one way of trying to solve for maximizing tax efficiency is by essentially maximizing after-tax returns in a strategy, and that can be done through a few strategies, and the main one that gets talked about is generally this concept of systematic tax loss harvesting or algorithmic tax loss harvesting.

(08:36):

And the concept there is really as and when the losses appear in the portfolio, you would essentially sell a security that is at a loss and replace that security with the commensurate security from a risk perspective because you can lock in the losses that you have harvested while at the same time maintaining the overall risk characteristics of the portfolio. If you do that systematically through time, what you can do is essentially accumulate losses in the portfolio, which can ultimately be used to offset gains in the same portfolio or elsewhere in your asset allocation mix.

(09:13):

The other strategy that generally people refer to is this concept of transitioning portfolios in a tax-aware fashion to either direct indexing or other custom SMAs. And the concept there is you have a legacy portfolio, could be a concentrated portfolio either in one stock or a mutual fund or an ETF that has embedded gains, or it could be a portfolio that the advisor has been managing through time, what we call is these unmanaged portfolios comprised of equities or bond securities. Those portfolios can be transitioned in a tax-aware fashion to a managed solution. While you're actually transitioning the portfolio you pay attention to the tax cost to the end investor. These are some of the commonly known

kind of tax strategies. There's another one that generally doesn't get that much reference, is this concept of systematic cash withdrawal in a tax-sufficient way. So for example, you have a portfolio that's been managed and you want to withdraw cash from the portfolio systematically through time. Now how do you do that in a tax-aware fashion so that the tax cost of selling securities and taking the cash-out is minimized?

(10:21):

I tend to think about this concept of systematic tax management as an all-weather strategy. The reason is it doesn't matter if it's an upward trending or a downward trending market, there are always opportunities to harvest losses, especially in an equity portfolio where you're holding hundreds of securities in a direct indexing portfolio. You can do the same in bond portfolios as well, although the number of securities that you hold in a bond portfolio is limited, but losses do appear at times and when losses do appear, you can sell out of those securities and harvest those losses.

Adam Bass (10:56):

So even if there's a down year in the markets, it doesn't necessarily mean you can't make the best of it through some of these strategies? Am I hearing you correctly on that?

Manju Boraiah (11:09):

Or even an up-year, right? So if you think about a year when the index has gone up, pre-COVID when we had this massive bull run in the markets, especially in the equity space, even in an up-year, you will find a handful of securities in certain sectors that have underperformed, right? So you can harvest losses in that part of the index so that you can actually maximize the overall after-tax returns for a direct indexing strategy. You have more options to harvest losses in a down-year than in an up-year, but there are always options to harvest losses, which is really what the concept of direct indexing capitalizes on.

Adam Bass (11:49):

Now that all makes complete sense, but as Raina, Manju and Joseph all pointed out, integrating tax-based considerations, well that's always been a part of an advisor's mandate. So the question is, what's changed?

Raina Oberoi (12:06):

What's changed today is really that technology has empowered the wealth manager with scalable, timely, and efficient tax management solutions that really can be tailored for each client. Managers can use systematic solutions to automatically and opportunistically do tax loss harvesting anytime they want and don't have to do this in a manual and ad-hoc fashion. And that's really been the challenge about harvesting these opportunities in terms of tax. The ability that technology has given us and given wealth managers is that you don't have to just think about a client's individual accounts, you could look across all the accounts a client owns and look for opportunities for tax savings.

(12:52):

You could also look at the accounts of multiple members in the client's household and recognize tax savings even across their accounts. So think about that, doing that in a manual fashion and then doing that in an automated and scalable fashion. It's a huge difference. There's a huge efficiency and there's

also the subjectivity out of that gets taken out and you can really make it more holistic and more accurate and very, very focused in terms of what you're trying to achieve in terms of client objectives.

Joseph Wickremasinghe (13:25):

If you are doing something manually versus doing it programmatically with the system, it's going to be more costly to do manually and therefore you won't be able to do it so you won't be able to offer it to as many clients without basically hiring more people and the margins on that tax management solutions are going to be higher and therefore you're going to offer it to your wealthier clients. So we are starting to see that it's coming down market a little bit to the mass affluent investors where they're not high net worth, but they might have a million or two or approaching that amount and to the point where the tax implications do become meaningful and they definitely will be interested in saving some percentage points on their return after taxes. And then now, because companies can offer it much, much more cheaply, they can offer it to these clients at scale and still make money for themselves while increasing the after-tax return of their client.

Adam Bass (14:25):

As noted earlier, direct indexing or client-designed indexes as Raina called them, that allows wealth managers to build customized portfolios that are based on client preferences, and it also provides a benchmark that can be used to accurately measure the portfolio's performance with those preferences in mind. But how do you accurately benchmark for taxes? How do you measure what's known as tax alpha? Raina and Joseph were two of the authors of a recent MSCI research paper on that very subject. I asked them to talk through some of those findings.

Raina Oberoi (15:07):

Wealth managers today have several choices in terms of tools and vehicles to help clients achieve their objectives, but at the same time both managers also have to prove their value add to clients. Just like anything, everyone's asking more questions, everyone's requiring more transparency. Now, individual investors in the US are increasingly wanting to understand the tax implications of the wealth manager's portfolio management decisions, and so one of the natural questions is, "What was my after-tax return and how did you make it better than what it could have been on its own?" Right? Wealth managers have to explain a portfolio's return on an after-tax basis, which you would think is extremely common, and that's how it's done, but it's not always done, right?

(15:55):

A term like tax alpha, which is actually a reasonably well-known term in the wealth management industry, this term can help managers demonstrate the value of their tax management to clients. Now, you could just say isn't just showing the dollars you saved compared to the pre-tax portfolio enough? That's how it's being done today in a sense, right? But it's not really enough because you don't get the transparency into what drove those tax savings. So in our paper, we've actually proposed ways of really calculating this tax alpha and really showing what the pros and cons of both of those approaches are. But at the end of the day, the tax alpha is not a new concept. Is it widely used? Not yet.

Adam Bass (16:40):

It sounds like you're talking a lot about setting a standard or a benchmark for lack of a better term. Why have we not seen that yet?

Raina Oberoi (16:50):

There are some methodologies that have been proposed out there, especially when you think about the first approach, which is the shadow benchmarking approach. We've obviously expanded on that approach a lot more, but actually that was proposed by the United States Investment Performance Committee, the USIPC, but it's not adopted widely because it's extremely complex to implement. And this approach really, think about it, involves creating hypothetical investment portfolios that replicate the constituents and weights of the client design index for every single account. Imagine maintaining that. And then there are also a few assumptions that you have to make along the way that can bring some ambiguity in how different wealth managers may implement this.

(17:37):

But then there's another methodology we proposed, the events-based one, which is a more new innovative methodology, not really proposed by anyone in the industry. Now this methodology is a lot more practical in terms of implementation, and here it's only each client taxable event that's analyzed and you don't have to maintain the shadow benchmarks for each client account, but once again, comes with certain limitations where, for example, previous actions aren't carried forward, right? So again, there are pros and cons here, and as you can see, it's clearly something that does require a standard setter, but it's not easy. But the one thing that's clear in all of this when we discuss this with clients is that there is clearly a need and an increasing need for wealth managers to speak a similar language and to be able to explain their tax alpha and their value-add so that it makes it even easier for the clients to evaluate and to consider this across different accounts, across different advisors and across different wealth managers.

Adam Bass (18:41):

An example would be good here. Joseph?

Joseph Wickremasinghe (18:44):

So coming up with this reference rate of taxation is challenging because it's different for every investor, and unlike investments themselves, it also could be impacted by decisions that clients, the investor is making. For example, let's say you have a portfolio you're managing and you decide to buy a boat or a car or something, and so you have the wealth manager, draw however much money you need for this purchase, and that typically will incur a tax liability. If you're making no cash withdrawal or a liquidation of a portfolio, there's obviously lots of different ways of doing it, you will most likely still incur some taxes but you need to figure out what is a reasonable amount of taxes that would be incurred for this withdrawal, and then let me use that number to measure how well my manager actually executed the withdrawal on my behalf.

Adam Bass (19:45):

So when you're talking about this benchmark or this standard, it sounds like not only is it different from investor to investor, is it actually different from year to year for that investor?

Joseph Wickremasinghe (19:57):

Yes, it could well be. So for example, if there is a purchase or withdrawal that's required for college tuition or some other liquidity need for this particular investor, that is going to immediately have an impact on the amount of taxes that they pay and therefore their tax alpha. If you're a wealth manager, every time you interact with a client, you need to either directly or indirectly remind them why they have retained you. So you always want to be able to talk about, "Here's the value add I'm providing for you this quarter, this month since we last spoke."

(20:32):

And so being able to calculate this tax alpha metric easily and be able to say, "Hey, we spoke last month, but since then I've saved you five basis points in taxes," or, "I've increased your after-tax return by 10 basis points," or, "I avoided this tax bill or that tax bill," having those numbers at your fingertips and being able to very clearly show, "This is what the market did, this is what you would've done had I not been advising you, and here's where we are based on my input, your decisions and my expertise." Being able to do that allows wealth managers to have another point of differentiation or another area in which they can show they can add value.

Adam Bass (21:14):

We've talked about the need for greater personalization and transparency as well as how technology has driven the ability to provide this, along with tax efficiency at scale. Now, Manju pointed to another factor that's creating this wave, this opportunity for investors, advisors, asset managers, and, well, everyone across the investment ecosystem.

Manju Boraiah (21:42):

My personal view is that wealth is definitely the next frontier for the asset management world. Within wealth, the mega-trend that I am really interested in following is this great wealth transfer, 84 trillion is going to change hands from the top 1.5% of population, especially all the baby boomers and older generation to the younger generation, the Gen Zs and the Gen X and the millennials of the world over the next two decades. Now, that multi-generational wealth transfer, in my view, is one of the most significant factors that's going to affect especially the ultra-high net worth and high-net worth segments of the industry to come.

(22:19):

Now the question is why should we care, right? If you look at the assets in motion, more than half of these assets are held in real estate or pension entitlements, and the other half is in liquid assets like mutual funds, ETF, SMAs, or direct ownership of bonds and struts. Now, as the wealth changes hands, complex financial planning and wealth restructuring will become critical in my view, and what's more pressing for clients will be tax planning and ongoing tax management. Also, data shows that 70% of folks who inherit the wealth actually end up fighting their financial advisor. So two out of three investors actually have done that based on recent data. So that shows clients are more holistic when it comes to financial advice. They're looking for holistic financial advice from advisors. So advisors now have to pay attention to really not just structuring the portfolio, but also providing holistic tax management and being able to essentially do a lot more than what they used to do for these end investors.

Adam Bass (23:21):

First of all, let me say thank you very much for including Gen X in that, we are so often left out of this conversation. I really appreciate that. But I'm also curious, I would imagine that Millennials, Gen X, Gen Z would be more used to being able to personalize everything. Is that something that's going on here too, that it's just an expectation that something will be crafted for me?

Manju Boraiah (23:50):

Yeah, I agree, but there are some guardrails around that, Adam. If you look at obviously personalization as a trend in the retail space, you can actually personalize your shoes on a website and then you can have that sitting in front of your doorstep in two days. People call it like application of retail, right? So I think that trend has actually come to retail investing as well, but there are limitations in my view, right? So there are things that you can customize within the investment guardrails, and there are things that you should not customize to make sure that the portfolio is diversified and still meets the investment acumen from an asset manager perspective, right? I do think that the trend is in that direction towards hyper-customization within guardrails, but tax efficiency piece does take front and center here, it becomes the main reason why people want to customize because they want to maximize their after-tax efficiency, but at the same time they can achieve other objectives as well.

Adam Bass (24:58):

Raina concurred.

Raina Oberoi (25:00):

For me personally, it's a very exciting space because there are so many players and there's a ton of innovation that's happening between the smaller players, the emerging players, and the bigger players. So I think that's great, it's creating awareness, creating education. Now, the conversation we are having with clients of what clients look to us is really based on the expertise that we've had, and what we are doing is bringing all of that together, all that expertise to the wealth management industry. So think about the expertise in building indexes. So our clients obviously care about domestic and international indexes, they care about investment focus indexes as factors, ESG, climate, thematic, et cetera. So they're coming to us to understand how can they get exposure to these different investment characteristics via indexes, which is again, something not new, we've done this in the institutional space forever, and now we are applying that to the wealth management space.

(25:57):

The other area is MSCI has also been such a stalwart in the world of analytics, risk models and optimization. So essentially what clients are looking to us for is, can MSCI help me design a personalized client design index with my preferences? So really it's one ecosystem if you think about. It's your client design index, which reflects your portfolio with your personal preferences, and then you can apply a tax efficiency overlay on top of that using optimization, and then be able to achieve even your tax outcomes along with your original investment outcomes. Right now, I think it's still catered to a certain subset of the wealth clientele, and I think that is a roadblock right now, but I think it's only a matter of time, and it gets down to anyone and everyone who will be able to use these tools for better investment decisions.

Adam Bass (26:51):

But no matter how much technology evolves and how far we go, in the end...

Raina Oberoi (26:58):

Trust and confidence is still going to be key. That's where the wealth manager is going to play an even more important role because those who can use these tools, this data, this entire ecosystem to their advantage, build a trust with their clients, those are the ones who are really going to shine. Then there are players like us where if we can provide the tools, the data quality, and the entire ecosystem for these wealth managers to succeed, then as a result, we build the trust with our clients, right? So at the end of the day, sometimes when technology comes in, people tend to get ahead and get excited, but we still have to go back to the basics in terms of trust, confidence and that foundation that all of this was built on.

Adam Bass (27:48):

That's all for this week. A big thank you from Joe and me to Raina, Joseph and Manju, and of course, as always to all of you for listening. We'll be back next time with fresh insights for global investors. Until then, I'm your host Adam Bass, and this is MSCI Perspectives. Stay safe, everyone.

About MSCI

MSCI is a leading provider of critical decision support tools and services for the global investment community. With over 50 years of expertise in research, data and technology, we power better investment decisions by enabling clients to understand and analyze key drivers of risk and return and confidently build more effective portfolios. We create industry-leading research-enhanced solutions that clients use to gain insight into and improve transparency across the investment process. To learn more, please visit www.msci.com.

This document and all of the information contained in it, including without limitation all text, data, graphs, charts (collectively, the "Information") is the property of MSCI Inc. or its subsidiaries (collectively, "MSCI"), or MSCI's licensors, direct or indirect suppliers or any third party involved in making or compiling any Information (collectively, with MSCI, the "Information Providers") and is provided for informational purposes only. The Information may not be modified, reverse-engineered, reproduced or disseminated in whole or in part without prior written permission from MSCI.

The Information may not be used to create derivative works or to verify or correct other data or information. For example (but without limitation), the Information may not be used to create indexes, databases, risk models, analytics, software, or in connection with the issuing, offering, sponsoring, managing or marketing of any securities, portfolios, financial products or other investment vehicles utilizing or based on, linked to, tracking or otherwise derived from the Information or any other MSCI data, information, products or services.

The user of the Information assumes the entire risk of any use it may make or permit to be made of the Information. NONE OF THE INFORMATION PROVIDERS MAKES ANY EXPRESS OR IMPLIED WARRANTIES OR REPRESENTATIONS WITH RESPECT TO THE INFORMATION (OR THE RESULTS TO BE OBTAINED BY THE USE THEREOF), AND TO THE MAXIMUM EXTENT

PERMITTED BY APPLICABLE LAW, EACH INFORMATION PROVIDER EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES (INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF ORIGINALITY, ACCURACY, TIMELINESS, NON-INFRINGEMENT, COMPLETENESS, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE) WITH RESPECT TO ANY OF THE INFORMATION.

Without limiting any of the foregoing and to the maximum extent permitted by applicable law, in no event shall any Information Provider have any liability regarding any of the Information for any direct, indirect, special, punitive, consequential (including lost profits) or any other damages even if notified of the possibility of such damages. The foregoing shall not exclude or limit any liability that may not by applicable law be excluded or limited, including without limitation (as applicable), any liability for death or personal injury to the extent that such injury results from the negligence or willful default of itself, its servants, agents or sub-contractors.

Information containing any historical information, data or analysis should not be taken as an indication or guarantee of any future performance, analysis, forecast or prediction. Past performance does not guarantee future results.

The Information should not be relied on and is not a substitute for the skill, judgment and experience of the user, its management, employees, advisors and/or clients when making investment and other business decisions. All Information is impersonal and not tailored to the needs of any person, entity or group of persons.

None of the Information constitutes an offer to sell (or a solicitation of an offer to buy), any security, financial product or other investment vehicle or any trading strategy.

It is not possible to invest directly in an index. Exposure to an asset class or trading strategy or other category represented by an index is only available through third party investable instruments (if any) based on that index. MSCI does not issue, sponsor, endorse, market, offer, review or otherwise express any opinion regarding any fund, ETF, derivative or other security, investment, financial product or trading strategy that is based on, linked to or seeks to provide an investment return related to the performance of any MSCI index (collectively, "Index Linked Investments"). MSCI makes no assurance that any Index Linked Investments will accurately track index performance or provide positive investment returns. MSCI Inc. is not an investment adviser or fiduciary and MSCI makes no representation regarding the advisability of investing in any Index Linked Investments.

Index returns do not represent the results of actual trading of investible assets/securities. MSCI maintains and calculates indexes, but does not manage actual assets. Index returns do not reflect payment of any sales charges or fees an investor may pay to purchase the securities underlying the index or Index Linked Investments. The imposition of these fees and charges would cause the performance of an Index Linked Investment to be different than the MSCI index performance.

The Information may contain back tested data. Back-tested performance is not actual performance, but is hypothetical. There are frequently material differences between back tested performance results and actual results subsequently achieved by any investment strategy.

Constituents of MSCI equity indexes are listed companies, which are included in or excluded from the indexes according to the application of the relevant index methodologies. Accordingly, constituents in MSCI equity indexes may include MSCI Inc., clients of MSCI or suppliers to MSCI. Inclusion of a security within an MSCI index is not a recommendation by MSCI to buy, sell, or hold such security, nor is it considered to be investment advice.

Data and information produced by various affiliates of MSCI Inc., including MSCI ESG Research LLC and Barra LLC, may be used in calculating certain MSCI indexes. More information can be found in the relevant index methodologies on www.msci.com.

MSCI receives compensation in connection with licensing its indexes to third parties. MSCI Inc.'s revenue includes fees based on assets in Index Linked Investments. Information can be found in MSCI Inc.'s company filings on the Investor Relations section of www.msci.com.

MSCI ESG Research LLC is a Registered Investment Adviser under the Investment Advisers Act of 1940 and a subsidiary of MSCI Inc. Except with respect to any applicable products or services from MSCI ESG Research, neither MSCI nor any of its products or services recommends, endorses, approves or otherwise expresses any opinion regarding any issuer, securities, financial products or instruments or trading strategies and MSCI's products or services are not intended to constitute investment advice or a recommendation to make (or refrain from making) any kind of investment decision and may not be relied on as such. Issuers mentioned or included in any MSCI ESG Research materials may include MSCI Inc., clients of MSCI or suppliers to MSCI, and may also purchase research or other products or services from MSCI ESG Research. MSCI ESG Research materials, including materials utilized in any MSCI ESG Indexes or other products, have not been submitted to, nor received approval from, the United States Securities and Exchange Commission or any other regulatory body.

Any use of or access to products, services or information of MSCI requires a license from MSCI. MSCI, Barra, RiskMetrics, IPD and other MSCI brands and product names are the trademarks, service marks, or registered trademarks of MSCI or its subsidiaries in the United States and other jurisdictions. The Global Industry Classification Standard (GICS) was developed by and is the exclusive property of MSCI and Standard & Poor's. "Global Industry Classification Standard (GICS)" is a service mark of MSCI and Standard & Poor's.

MIFID2/MIFIR notice: MSCI ESG Research LLC does not distribute or act as an intermediary for financial instruments or structured deposits, nor does it deal on its own account, provide execution services for others or manage client accounts. No MSCI ESG Research product or service supports, promotes or is intended to support or promote any such activity. MSCI ESG Research is an independent provider of ESG data, reports and ratings based on published methodologies and available to clients on a subscription basis. We do not provide custom or one-off ratings or recommendations of securities or other financial instruments upon request.

Privacy notice: For information about how MSCI ESG Research LLC collects and uses personal data concerning officers and directors, please refer to our Privacy Notice at <https://www.msci.com/privacy-pledge>.