

Not Your Father's Stagflation (or Is It?)

Featuring:

Mark Carver, Managing Director & Global Head Of Equity Factor Products And Equity Portfolio Management, MSCI

Hitendra Varsani, Managing Director, Global Solutions Research, MSCI

Anthony Kruger, Director, EMEA Head of Factor ETFs, iShares

Adam Bass (00:03):

This is MSCI Perspectives, 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 April 7th, 2022. Today on the program, we back at the wild ride that was the first quarter of 2022, with some hope of finding clues to help us manage whatever is to come. And if the last couple of years have taught us anything, whatever is to come is likely something few of us have even thought about. Getting back to the last three months, some might say it's been a tale of two quarters.

Mark Carver (00:45):

So a quarter of two tales maybe is a better way to say that.

Adam Bass (00:50):

Yes, of course, Mark, you're right. I mean, that does make more sense. For our listeners, that's friend of the pod, Mark Carver, Global Head of Equity Factor Products, Equity Portfolio Management, and resident Dickens expert, apparently, at MSCI. We'll hear more from Mark in a bit. But for a high level view of those two tales, we turn to another old friend.

Hitendra Varsani (01:15):

I'm Hitendra Varsani, part of MSCI's global solutions research team based in London. So overall, global equities as measured by MSCI ACWI returned -5.3% but that doesn't tell the full picture. In our latest research, disentangling market gyrations, we aim to uncover significant rotations in the underlying markets. Until your opening remarks, there were two events that rolled markets. The first was the surge in inflation in developed markets, being the U.S., in UK, in Europe, going to levels not seen for over 30 years. And that added pressure on central banks to raise rates.

Hitendra Varsani (02:02):

Now, in terms of market impact, that led to some of the largest rotations between style indexes, namely from growth into value, not seen for several years. The second tale event was stemming from the geopolitical tensions from Russia's invasion of Ukraine. And that led to a significant upward reprising of commodities. Russia is a key supplier of oil, natural gas, coal, aluminum and wheat, Ukraine, key exporter of wheat, and that's added the upward pressure to inflation, which was already high. Potentially adding further disruption to supply chains and potentially derailing the global economic recovery.

Adam Bass (02:47):

Lots to unpack there. So let's start from the start.

Mark Carver (02:51):

We're hearing a lot from clients about understanding the impact of the way equity assets trade in inflationary environments. What can we learn from parts of the world where we have seen this type of inflation? Stress tests are more important to clients so they can understand how to tackle this new frontier of rising inflation. Investors are saying, "What kind of inflation will this be?" Our research team defines inflation under two states. What we might call a heating up economy, that is rising inflation with rising economic growth. You might say that, that's a demand inflation, and some might think that can be good for equity markets. The other state is rising inflation with lower growth. That's a stagflationary environment, and there's a little bit of debate going on in our industry about which condition we'll see. Will we see a heating up economy or stagflationary environment? And obviously equity assets, whether we look at the factors or sectors will perform differently.

Mark Carver (04:00):

So clients are very keen to understand what we can share with them from a research and a stress testing perspective about how assets will trade and obviously be priced in those different environments. I will confess I'm not a macro economist. I will however, tell you what we learned in our long dated study. And this was done by some of my colleagues on the research team, where we looked at style factors as well as sectors and how they performed in stagflationary environments. Now, it's tough enough when you have prices going up and the economies are still strong or more resilient, but in stagflationary environment, it's a much harsher environment to invest in. And in those environments, the sectors that tend to do well are more, as you might expect those with pricing power, healthcare, utilities. On the factor side, the clear winner that we noted were the involved strategies.

Mark Carver (05:06):

Some listeners may say, well, of course, that stands to reason that's the most defensive factor index. But the fascinating thing was on the sector side, it was much more about pricing power with the sectors that did better. On the factor side, it was much more about the defensive nature. And so I think

investors are gripping for the reality that we could have stagflation. But what they're telling us is that it probably will be different in certain regions and countries within certain regions. So in other words, we may see more of that heating up environment in one part of the world, and a stagflationary environment in another part of the world,

Anthony Kruger (05:55):

A phrase that we see more and more in the market at the moment is stagflation and the risk of stagflation.

Adam Bass (06:03):

That's our third guest.

Anthony Kruger (06:05):

I'm Anthony Kruger. I am Head of Factor ETFs at iShares, BlackRock in EMEA. We do see that Europe probably has a bit more of concern around this area. There might be a bigger hit to growth in Europe. So stagflation well, minimum volatility and quality perform well while value and small size struggle. And momentum can also perform quite well. Now, for an institutional investor, you might want to dig a bit deeper and think about the quality factor. And we think this factor is really interesting at the moment because if you think about the markets in the last decade, a lot of market rhetoric was around revenue growth. It was about companies growing their revenues quickly, and they might not be profitable yet, but as long as you are growing your revenues. The tone has shifted much more towards quality and focus on margin and sustainability of profitability.

Anthony Kruger (07:30):

So now we're in, I'd say a margin led cycle. Just to finish off this thought process, if we're also potentially thinking about the other side of stagflation is an inflationary boom. So that is where we still see higher inflation, but economic growth is still strong. And we are still seeing economic growth in the U.S. and Europe and around the world. So do we see an inflationary boom as a likely scenario and which factors perform well then? Well, it's going to be small size and value that perform particularly well during an inflationary boom scenario. So for an instant traditional investor, thinking about, do they have some value exposure in their portfolio? Do they have some quality exposure in their portfolio?

Adam Bass (08:30):

Sometimes those segues, they just get handed to you. So let's stick with that question of growth and value. We heard Hitendra talk about this earlier as well. And this is one area where Hitendra and Mark seem to be very much on the same page.

Mark Carver (08:47):

When we think about the beginning of the quarter, where we were much more concerned about the macroeconomic environment, the big headline, there was the growth to value rotation. And make no mistake, we did see a rotation from growth to value, but it was really too simplistic to define it that way. When we looked more deeply at the factor structure, what we were really witnessing at the beginning of the quarter was a rotation away from the riskiest end of growth stocks, to stocks that had been very beaten down, so the beaten down value stocks. So to me, it was almost more of a risk to cheap rotation. The reason I say that, when we look at the factors that were performing worst and best at the beginning of the quarter, pre the Russian invasion, residual volatility, which by the way, ended up being the weakest performing factor for the entire quarter but it was really weak prior to the Russian invasion.

Mark Carver (09:46):

At the other end, you saw the value dimensions, earnings yield in long term reversal, as the best performing. At that time, growth was actually uninteresting. It was modestly down. For the full quarter earnings yield performed well and growth actually got continuously weaker. So it ended up down for the quarter as investors would expect. But I think it's always important to go beyond the headlines, because what we know is that not all growth managers are alike, not all value managers are alike. And as a result to really understand the difference between one and another, you need to look deeply at what's really driving the portfolio, those underlying exposures that are less obvious, that often tells you the truth.

Hitendra Varsani (10:35):

So when I look back over the majority of my career growth has outperformed value, which it goes against what I learned at university. Now in the last 20 years, yes, we've seen various crisis periods, the tech bubble, the financial crisis, the COVID crisis, and during certain episodes value has outperformed growth, particularly during this early stage market recoveries, but over the full sample, generally, growth has outperformed value. Now taking a step back, how and when has this happened? Well, this happened during a period of a secular decline in interest rates, low inflation, and a strong trend towards globalization. And even if we look back at say the last two years during the height of the global pandemic, there's been surplus liquidity from global central banks, investors have continued to chase those high risk growth stocks.

Hitendra Varsani (11:34):

Now, the questions on investors minds now is, the backdrop has changed. Rates are rising. Inflation is surged. We're in a recovery from COVID and we are arguably in the phase of de-globalization. So what does that mean for the growth versus value trade? And the answer is not as simple as growth outperforms, then value underperforms. There's actually a more nuance to this. If we look within growth, it's actually the high risk growth stocks that have sold off the most and rotated into value. We look at low risk, high quality growth that's remained somewhat resilient in the recent history, but also in the longer term as well. I think when we look at investors, they typically look for context in terms of how does my strategy perform in different market environments.

Hitendra Varsani (12:29):

Most investors were taught that for very valuation risk they would be compensated with risk premiums and that hasn't paid off. So investors are now questioning has the definition of value changed. Has the dynamics of the economy changed where we're less reliable on machinery and production of hard goods and hardware to somewhere that's more software and technology orientated. And so perhaps value should consider these new descriptors, be it research and development, innovation, patents, and so on, so forth. So I would say the way investors perceive value is also evolving, but also keep in mind is we're now in a rising rate, rising inflation environment with potentially high economic growth. Should we recover from the recent turmoil? And historically that's been favorable for value.

Anthony Kruger (13:28):

There is a quote we've used and it came from a research notes I read, but it's actually from Guns N' Roses. It's 14 years of silence, 14 years of pain. And it's 14 years that are gone forever and I'll never have a gain. And this really speaks to the period of time where value has underperformed growth. And there have been periods during the last 14 years where we have had value rallies, but they have been some false dawns if I may put it that way. And when we sit around at a table often with investors, 14 years is a long time. And for some people, it may even be their whole investing career. So we need to look back further and assess what is different this time and why has this topic at the beginning of the year come to the fall?

Anthony Kruger (14:31):

So typically when you've got a value type of stock, it will typically trade at a much lower PE. And that just means it's the amount of time that you expect to get paid back your yearly cash flow. So if a company has a PE of five and you've got \$2 earnings per share, and you use a 2% discount rate, you would discount that over the five years PE of five, and you get to your net present value of that stock. Now, if you look at a growth stock, they're typically trading at PEs much higher. Some growth stocks PEs in the hundreds. But if we took, for example, a stock of a PE of say 66, so 66 years, it would take to get back to a net present value with \$8 earnings per share.

Anthony Kruger (15:39):

If you then used a 2% discount rate, so as we see essentially your discount rate you'd use off the yield curve, at whichever point you want to use, the growth stock with the 66 PE is a lot more sensitive to that. And so you end up with a huge discount to its potential stock price at this point in time. So what you seeing is, as we see the discount rate increase, you see this big divergence between a value stock and a growth stock, just fundamentally in how long an investor can expect to get their money back essentially, and how that impacts your future earnings. And that's what really was happening in the market at the beginning of the year. And we saw a huge amount of flow go into value orientated ETFs, and value index products, as investors sort to take advantage of the steepening yield curve and to perhaps offset some of their growth biases in their portfolios.

Adam Bass (17:01):

But where do those growth biases come from?

Mark Carver (17:04):

Well, I think that people hold to their convictions and that there for sure are divides between the growth investor and the value investor. And that has played out where there's been a lot of value advocates who have had to defend their value style for the, let's call it the last decade or more. And some of them are now taking a victory lap, but the truth is there are growth defenders and there will be a divide. The truth is that, the best investors are adaptable. They look at the macro conditions and they compare the changing conditions of today, versus what we've seen over the last long period of time or more recent period of time to try to say, "Look, no two markets are exactly the same, but how are the underlying dynamics shifting? And then how do I invest based on those dynamics?"

Mark Carver (18:12):

And so, you are seeing this now struggle for some people who are challenging their own convictions. And I think, people like the familiar. People respond to things based on their personal experience. And one of the things that we can hear in the client conversations we're having, is this internal fight that some people are having about, is this time different? And what I mean by that is every period we've seen for much of the last 40 years, when growth has struggled, that struggle has been in some ways, a buying opportunity for clients where they were able to go in, take advantage of the draw down in growth, buy growth assets. And that's one over time. Now, for sure, in the last 40 years, there have been extended periods of time where value investments have outperformed growth.

Mark Carver (19:10):

But if you look at the 40 year period in total, or the 30 year period in total, generally growth has been favorable. So you can hear some investors saying, "This presents a buying opportunity." In fact, I heard one market analyst today on a popular TV program here in the states, arguing this exact case that growth has come down. A lot of these stocks are now trading at more attractive valuation and it's the right time to step in. Now, some of our clients surely have that view. Other clients are a little bit more circumspect. One of the things that's been a tailwind to growth for the last several years is the declining rate of inflation, the declining interest rates.

Mark Carver (19:57):

Today, that dynamic is shifting. And the question on the minds of many is how sustainable is this level of inflation with deglobalization, decarbonization in some of the other now headwinds that we face from an inflationary environment. And if inflation at higher levels is here to stay, that could change the calculus of growth to value. And that's what many of our clients are struggling with. Some are for sure, taking the advantage, buying into growth on the dips. Others are repositioning their portfolios to be either more value oriented or more defensive in nature.

Adam Bass (20:40):

The second tale of this quarter, as Hitendra noted earlier, is geopolitical risk. That's a truism and the euphemism for the war started when Russia invaded Ukraine back in February. Among other issues for investors. This has meant a jolt to commodities markets, especially oil.

Hitendra Varsani (21:03):

If we look at our recent research from MSCI, taking a longer term view, we showed that since 1975 net exporters of oil and gas in developed markets such as Norway and Canada, they've typically outperformed during periods of rising oil. Now the recent spike in oil and gas prices has been a live stress test. And in fact, countries like Norway and Canada were amongst the strongest top performing countries, the U.S. as well, and that's a special case. The U.S. has historically been a net importer of oil and gas until recently as 2019. And by 2021, the U.S. was actually the world's largest producer of oil and gas. The U.S. comfortably outperformed Europe by 20 basis points this quarter. So the impact that the war has had through repricing of commodities has actually impacted countries in many different ways.

Mark Carver (22:06):

For sure the countries that you would expect, Russia, Ukraine, and countries that are more, higher proximity to that region performed weakly during the quarter. But what was really interesting is while that emerging markets overall did poorly, there were pockets of the emerging markets that did very well. And one that struck me was the Latin American region where the returns were quite strong. That may not surprise some of our listeners because of the makeup of that region. When we look at the exposures there, you have a market that is very materials heavy, that is very energy heavy, and those industries and sectors did it very well in the quarter, particularly as the crisis in Ukraine took hold. Energy prices spiked, commodities spiked and as a result, the stocks in those industries tended to rally toward the back end of the quarter.

Mark Carver (23:15):

And so when you take that as a full period, the emerging markets Latin American index ended up doing very well and it was a standout for the quarter. Australia was another market actually that did well. Australia market was up, I think over 6% for the quarter. And again, that's at energy heavy materials, heavy market. And so it would probably not surprise people that, that market also did fairly well during the quarter.

Adam Bass (23:47):

At one point, during my conversation with Anthony, we started talking about how investors, well, how people, they can find it difficult to focus on more than one thing at any one time. We won't go into the whole conversation here, but before we continue with the impacts of the war, I do want to spend a little

bit of time on it. It's an important point. And it's a good reminder of the importance of taking a holistic view.

Anthony Kruger (24:15):

But I think it's worth noticing that during times of stress, during what's happening in the market, it is important for investors to stay calm, to try and look through some of the noise and the headlines into what is happening in the markets. So, one thing we track at BlackRock is something our BlackRock Investment Institute put together called the Geopolitical Risk Indicator. Now this captures market attention to geopolitical risks, and it has spiked to the highest level in more than a year. And of course this has been driven by the conflict related risks. But it isn't only looking at the Russia conflict, it is also looking at some other areas, for instance, the global tech decoupling. So that we see as a risk that is probably a little bit underappreciated. And we see that as the strategic competition between the U.S. and China, and that is driving global fragmentation as both countries focus on boosting their self-reliance and reducing vulnerabilities in their tech sectors.

Anthony Kruger (25:43):

The other one we've got to remember that is still out there and is becoming more and more prevalent is major cyber attacks. And we see an increased risk particularly now of cyber attacks, both on corporate levels, on individuals, as ourselves, but also on institutions and governments. And finally, one that I think again is probably a little bit underappreciated, is climate policy. And this is rarely in what we are reading about. Now in the market, it's what we are experiencing now, talking to you from London today. We've seen that this crisis in Ukraine has brought energy security to the forefront. And the world needs more non Russian fossil fuels in the short term. And we believe that this crisis will make the world's transition to net zero more regionally divergence. So we believe in Europe, we believe they will boost decarbonization plans while in the U.S. by contrast, there's perhaps less incentive for the world's largest fossil fuel producer to transition. And in fact, the U.S. is trying to meet more of Europe's energy needs at the moment.

Adam Bass (27:22):

Let's return to investor considerations in the face of war. While of course we can't know what's going to happen, we can always look at what has happened during similar periods.

Mark Carver (27:34):

Our research team has put out a lot of material over the last quarter. But one of the things that I thought was really interesting about that, is this examination of the way markets have performed pre and post military conflict over the last 20 or 30 years. And they looked at five specific periods. And something that I thought was notable there was that the general observation or takeaway was that the trend that precipitated the conflict actually was the one that was sustained after the conflict. And that markets generally had a fairly muted response. The reason I share that is that for sure investors want

to be nimble, they want to be responsive, but what they're really looking for are insights for the way assets and equities have behaved in periods of time that feel a bit like today.

Mark Carver (28:36):

And today obviously a lot of that has been around the Russian Ukraine conflict. And can we learn something from the invasion of Crimea, from the Gulf Conflict in the 90s? And investors are really studying those periods to try to understand about the way they make one to adapt their own portfolios and be both defensive and obviously manage risk, but opportunistic where they can be.

Hitendra Varsani (29:00):

I mean, one aspect that's clear from just looking at previous periods of war is that every crisis is different. It's impacted people in different ways. It's impacted markets in different ways. And how it's impacted factor performance is also varied, but what is consistent across every crisis is that it has led to higher market volatility. And so strategies like minimum volatility have been useful tools to be able to dial down risk. And when we look back at the first quarter of 2022, the MSCI minimum volatility indexes have not just delivered lower volatility than their parent, but they've actually realized higher returns as well.

Adam Bass (29:46):

So is that the main lesson to draw from looking back at previous wars, volatile markets and how to approach them?

Hitendra Varsani (29:54):

I would say it's difficult to extrapolate from historical crisis in terms of performance, but in terms of actual factor performance, that's been highly variable.

Adam Bass (30:09):

So investors choose basically, let me just try defensive moves here, make sure I'm at less risk.

Hitendra Varsani (30:18):

That's right. So the classic strategy is to be able to build more resilient portfolio that can withstand crisis and recent research from MSCI is showing that quality, for example, is a factor that can demonstrate resilience throughout crisis periods, but also deliver outperformance over the long run as well.

Adam Bass (30:39):

It also seems to go back a little bit to the growth value question, in that if the market is volatile or the market is down overall on the seeking opportunity side, is this a time where we've seen value investors, get a bit more active, trying to buy the drops?

Hitendra Varsani (31:01):

So we saw a strong value outperformance prior to the start of the war, February 24th. But looking at the details since the start of the war, we've actually seen a rotation back into growth. We've seen a rotation back into higher volatility stocks to certain extent. So this geopolitical tension has impacted markets in different ways. And say, for example, from a U.S. investor's perspective, they may see this as a buying opportunity to increase their allocations to segments of the market that have sold off, but are somewhat distant from what's happening in Russia and Ukraine. Now in contrast, if we look at emerging markets, we've seen continued outperformance of growth of value over growth since the start of the war. So there's been strong divergence, even when you think about growth versus value, whether we're speaking about developed markets or emerging markets.

Adam Bass (32:04):

Following a quarter where macroeconomic risk and war held our focus and other concerns such as the developed market, emerging market divide, cybersecurity and climate change continued. The question for our guests is in the face of all this, what does it mean to be a "factor investor?"

Hitendra Varsani (32:28):

So a factor investor is having a holistic awareness of what's driving risk and return of the portfolio. And when investors construct long only portfolios, they may target a specific factor such as value or growth that we've spoken about, or perhaps more broadly a thematic strategy like innovation or efficient energy. Now, irrespective of these themes in a long only setting, these stocks will be exposed to side effects. Exposures to factors that were not intended, for example, efficient energy may have had negative exposure to value last year. So investors may in some sense over pay for growth. In another context, say with themes like innovation, they may be more exposed to risky stocks. So the recent events have reminded us that unintended exposures can have outside impact on returns. And so whatever the theme investors are targeting is to think about being factor aware from a more of a holistic point of view.

Mark Carver (33:37):

Some people might say that I say this because this is what I live and breathe, but my view is every investor's a factor investor. These are exposures, they're characteristics that are in your portfolio, whether you target them or not. So at a bare minimum, you need to be aware of what these exposures are and the impact they may have in your portfolio. However, what is equally true is that the way the average investor today thinks about factors is not the same as what it was in the past. Investors do

consider things like ESG, like climate. And this is so fascinating because what it tells you is investors are not so worried about the label of factor or non-factor about quant versus fundamental. But they're rather saying, "How do I get a set of investment characteristics into my portfolio that reflect my investment views?"

Mark Carver (34:35):

And many investors that includes managing their carbon footprint and they want to move toward a net zero world. Some investors want to invest for the new economy. That's an innovative thematic play if you will. The result of that to me is this exciting transition that's going on that reflects a refined way of thinking. I like to use the expression of first principles. Every investor we'll have factor exposure targeted or untargeted, intended or unintended. And as a consequence, we should think of ourselves as certainly being aware of those characteristics and what they might mean for the portfolio's risks, the portfolio's returns.

Adam Bass (35:20):

That's all for this week. A big thank you from Joe and me, to Mark, Hitendra and Anthony, and to all of you for listening. Next up on Perspectives, from proclamation to activation. We look at how different companies and investors have started to do the hard work it takes to live up to those net zero proclamations, even as we get further and further away from last year's COP26. Until then, I'm your host, Adam Bass and this is MSCI Perspectives. Stay safe.

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 be 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>.