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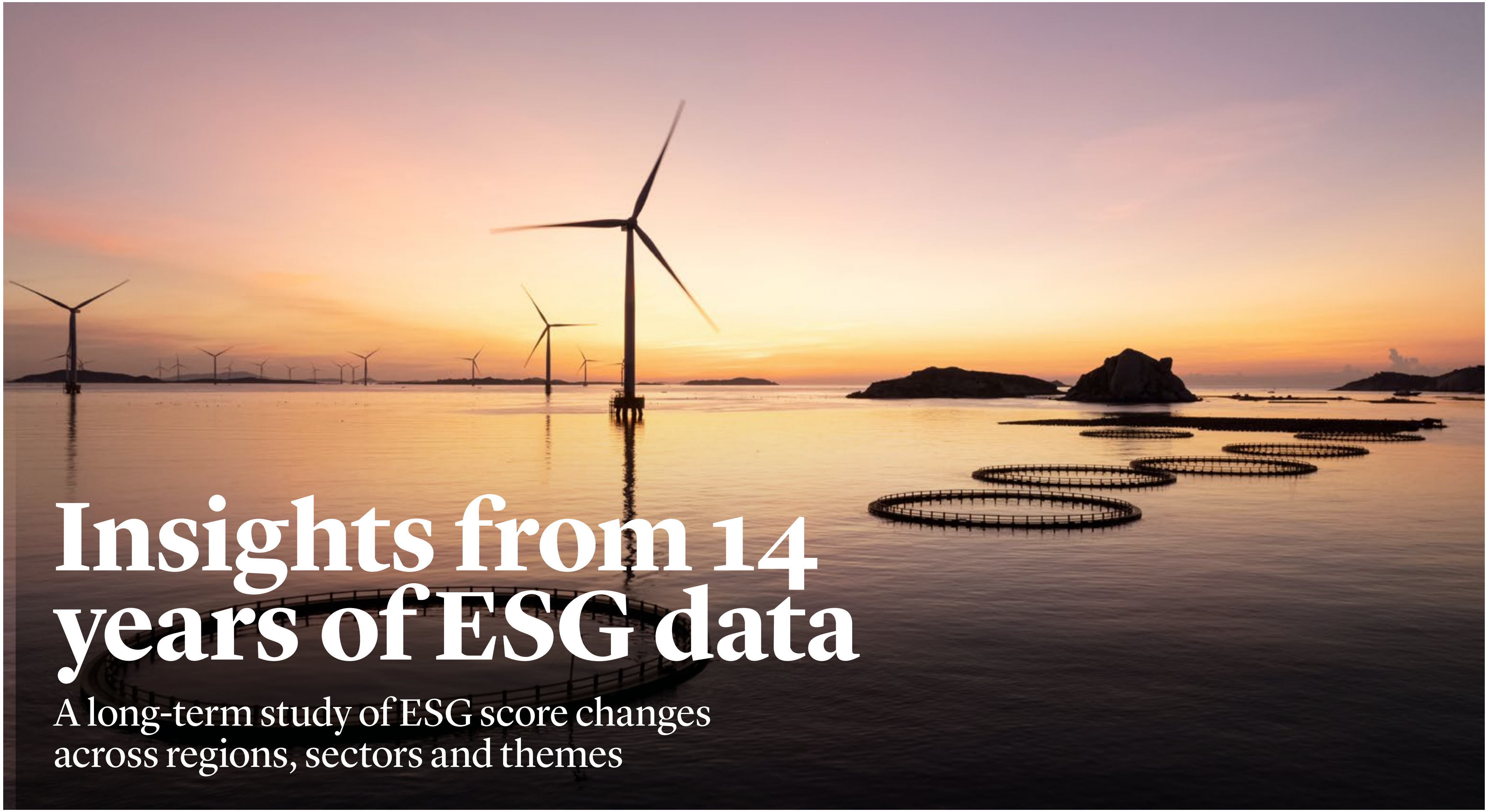

Insights from 14 years of ESG data

A long-term study of ESG score changes across regions, sectors and themes

Scroll

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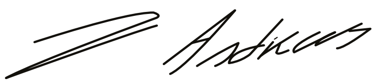

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Interactive PDF

Please use the buttons at the top or on the contents list to click and navigate your way through this report, or simply scroll your way through it.

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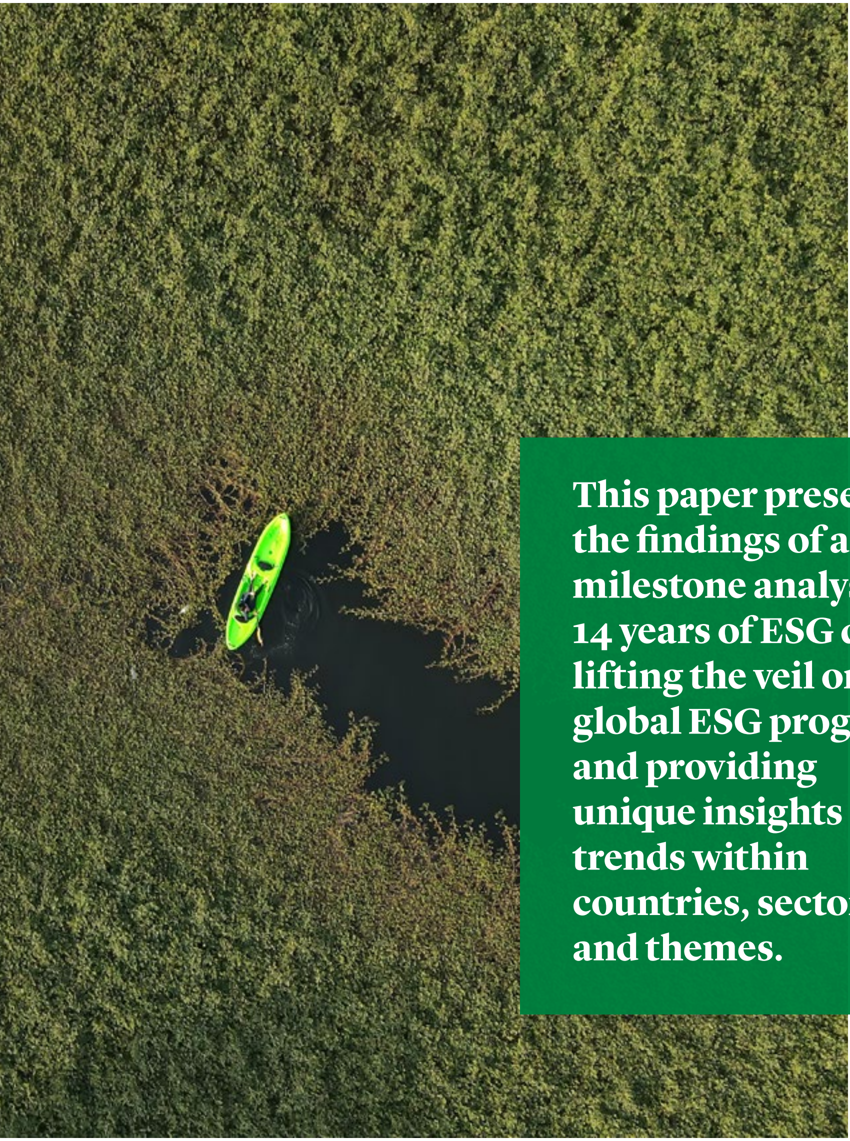


This paper presents the findings of a milestone analysis of 14 years of ESG data, lifting the veil on global ESG progress, and providing unique insights into trends within countries, sectors and themes.

Introduction

"If you can't measure it, you can't manage it."

While not technically a misquote, this line – perhaps the best-known quote from US engineer, statistician and management guru W. Edwards Deming – doesn't tell the whole story.

Deming firmly believed that data had a vital role to play in improving company management, so it's no wonder the short version of the quote has gained currency. But what he in fact said in *The New Economics* was: "It is wrong to suppose that if you can't measure it, you can't manage it – a costly myth."[1]

Sometimes, a widely held idea can be broadly valid (effective use of data can generate value for corporations) while simultaneously obscuring a more nuanced truth (many things cannot be measured within an organisation, yet still matter).

Similarly, the long-lamented gaps and inconsistencies in long-term ESG data can indeed make it difficult to discern overall progress, or to compare how different countries or sectors stack up.

Yet as the data has steadily improved, it's increasingly possible to paint a truly long-term picture of environmental, social and governance (ESG) progress at the index level, and to sift the data to provide meaningful and highly granular analysis of the various trends that together make up the overall direction of travel.

This paper does exactly that. It presents the findings of a milestone analysis of 14 years of ESG data, lifting the veil on global ESG progress, and providing unique insights into trends within countries, sectors and themes.

1. Source: https://direct.mit.edu/books/book/5014/The-New-Economics-for-Industry-Government

Five key conclusions from the study

Awareness leads to action:

We have seen continuous growth of market-level ESG scores over time. We believe this demonstrates that when companies and investors become aware of ESG issues, they are likely to come under public pressure to act.

Transparency builds trust:

The rise in our transparency scores reveals that openness and clear communication are being prioritised.

Diversity is crucial:

One of the most notable shifts has been the increasing role of women in leadership, leading to a rise in the S component of our ESG score. This indicates the increasing recognition of the value of diverse perspectives in decision-making.

Regional variances matter:

Different regions have different challenges and priorities. As such, it's vital to approach ESG considerations with an understanding of regional specificities.

Sustainable practices are the future:

Companies are recognising that to remain viable over the long term, addressing global challenges such as climate change, and seeking opportunities within these challenges, is not only desirable, but necessary.

Where do we go from here?

The developments in ESG data directly affect the investment landscape, providing investors with comprehensive tools for analysis in various areas. At LGIM, we engage with data providers to drive improvements in data availability, quality and coverage, and to improve understanding of what we require as investment managers in order to be able to use a data set.

As ESG data continues to evolve, this will help us evolve our engagement campaigns and our ESG scores, enabling us to add new metrics over time, to capture developments across markets, and to reflect the increased intensity of focus on ESG factors among investors and our clients.Just as companies are recognising the importance of addressing these global challenges, investors are also increasingly ramping up their focus on delivering real world change.

Turn to page 24 to read more about how we see increasing need for ESG integration shaping investment strategy in the years ahead.

Our purpose at LGIM is to create a better future through responsible investing.

Our core beliefs

We believe that responsible investing is essential to improve long-term returns, unearth opportunities and mitigate risks by fostering sustainable markets and economies. We believe effective stewardship involves working with companies, regulators, policymakers, peers and other stakeholders around the world to tackle systemic issues, material risks and opportunities.

That's why for more than 20 years, our award-winning[2] Investment Stewardship team has successfully campaigned on key issues, from corporate governance to diversity and climate change, escalating action when necessary to reach desired outcomes.

LGIM's governance structure – oversight of our responsible investment strategy is overseen and supervised by the highest level of governance bodies at the executive and board level – is aimed at ensuring rigour and accountability, as well as enabling us to continue meeting the highest standards of oversight for our clients' investments.

2.. Recent awards include the 'best in class' award at the 2021 ICGN Global Stewardship Awards. **Awards should not be considered a recommendation. Past performance is not a guide to the future.**

How ESG can be built into indices

Faced with the potentially catastrophic risks posed by climate change, more and more investors worldwide are seeking to align their portfolios to a net-zero trajectory. We believe index strategies can offer clearly defined decarbonisation pathways as a stepping stone in the climate transition.

The exclusion approach has been used to avoid having specific stocks or industries in an index. This approach has the benefit of being easy to communicate, and it offers peace of mind if an investor's ultimate objective is to remove exposure to specific securities and sectors.

But aggressive exclusions may alter the portfolio's profile quite significantly. As the level of exclusions increases, the adjusted index often strays from its parent benchmark, deviating from delivering a market-like, risk-return profile.

In our view, effective decarbonisation of index portfolios is best achieved with a combination of minimal exclusion standards and the reallocation of capital from laggards to leaders, with the aim of reducing carbon-emissions intensity by a fixed percentage relative to a parent benchmark.

The Future World family of indices

The Future World index family draws on LGIM's ESG score to help determine constituent weighting.

The methodology of LGIM's ESG score starts with an assessment of market-wide ESG issues, such as climate change or the dilution of shareholder rights.

This focus on overall market health, anchored with minimum standards, differentiates LGIM's ESG Score from many others applied in market indices.

The Future World philosophy encapsulates how we view our responsibilities as a large asset manager and as a steward of our clients' investments by considering ESG factors. It incorporates how we engage with companies, develop innovative products, evolve our investment process and manage risk to deliver sustainable long-term value.

Fund	Capability / Style	Sub-grouping	LGIM actively designed benchmarks
Future World North America Equity Index Fund	Index equity	Overseas Equity (North America)	Solactive L&G ESG North America Index
Future World Europe (ex UK) Equity Index Fund	Index equity	Overseas Equity (Europe)	Solactive L&G ESG Europe ex UK Index
Future World UK Equity Index Fund	Index equity	UK Equity	Solactive L&G ESG UK Index
Future World Asia Pacific (ex Japan) Equity Index Fund	Index equity	Overseas Equity (Asia Pacific)	Solactive L&G ESG Asia Pacific ex Japan Index
Future World Japan Equity Index Fund	Index equity	Overseas Equity (Japan)	Solactive L&G ESG Japan Index
Future World Developed (ex UK) Equity Index Fund	Index equity	Global equity	Solactive L&G ESG Developed ex UK Index
Future World Emerging Markets Equity Index Fund	Index equity	Emerging markets	Solactive L&G ESG Emerging Markets Index
Future World Global Equity Index Fund	Index equity	Global equity	Solactive L&G ESG Global Markets Index
Future World USD Corporate Bond Index Fund	Index fixed income	Overseas Corporate Bonds	Solactive L&G ESG USD Investment Grade Corporate TR Index
Future World EUR Corporate Bond Index Fund	Index fixed income	Overseas Corporate Bonds	Solactive L&G ESG EUR Investment Grade Corporate TR Index
Future World GBP Corporate Bond Index Fund	Index fixed income	UK Corporate Bonds	Solactive L&G ESG GBP Investment Grade Corporate TR Index

The value of an investment and any income taken from it is not guaranteed and can go down as well as up, you may not get back the amount you originally invested.

How the LGIM ESG score helps inform our investment stewardship

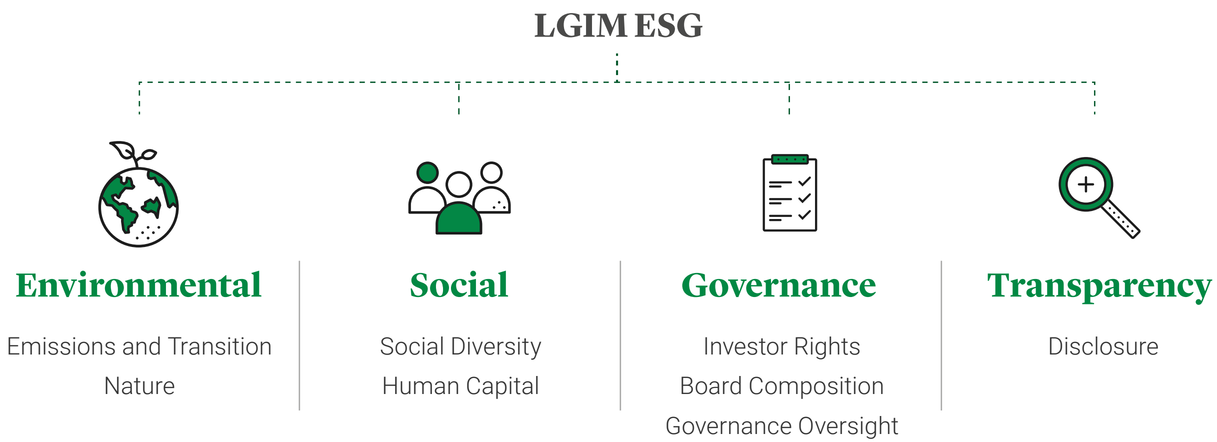
The LGIM ESG score is a comprehensive assessment that combines various ESG metrics and takes into account a company's overall transparency regarding ESG issues. Our methodology begins by evaluating ESG issues that could have a long-term impact on corporate performance and could represent increased instances of risks if not addressed. These range from carbon emissions and nature to gender diversity, board composition and investor rights.

These issues reflect many of the priorities identified by our Investment Stewardship team for engagement and campaigns; by creating a link through our ESG score between our stewardship activities and capital allocation, we draw on the transparency of our methodology and public approach to ESG ratings in order to support our broader aim of raising ESG standards across the global markets in which our clients are invested.

LGIM's ESG score examines all sectors and regions globally.

To ensure transparency and consistency, we have established a clear framework for assessing companies. This framework enables LGIM to allocate capital towards, or indeed away from, companies, based on their adherence to globally recognised ESG standards.

Figure 1. LGIM ESG score pillars and themes



Source: LGIM as at September 2023

The LGIM ESG score covers over **17,000** companies using **34** key ESG data points across a range of ESG factors.

For more details on the LGIM ESG score, please see the documentation on this link.

How the LGIM ESG score has evolved

	2018	2023
Data points	**28** data points	**34** data points
Coverage	**13,000** companies	over **17,000** companies

Source: ESG for companies (lgim.com)

We publicly disclose the ESG scores of companies globally on our website. The purpose is to enable companies to see how they measure up against the metrics we use in our assessment, including versus their peers, and also to encourage them to work with data providers to ensure that the data held is accurate and timely, thereby supporting the improvement of ESG data across the market.

Company engagement on the back of the LGIM ESG score

From an investment stewardship perspective, the LGIM ESG score is used to identify companies lagging our minimum expectations on what we consider to be financially material ESG issues. As data coverage and quality improves, reflected by the expansion of the LGIM ESG score since its inception, we are able to structure targeted engagement campaigns on specific ESG factors, and to help companies better understand what we expect of them and where we have identified areas for them to improve.

The role of ESG data: quality and trends

In the last decade there has been a surge in the availability of ESG data for global corporations, facilitating increasingly informed investment decisions. However, three broad issues remain:

- ESG data remains fragmented and inconsistent among data vendors
- Data is not always easily accessible, limiting its integration into mainstream investment processes
- Data quality assurance and data cleaning may be required

We expect continued improvement of ESG data coverage and the addition of new data points. While total consistency of data may not always be possible, especially in areas where it is based on models and assumptions, data quality is essential for any investment process that consumes ESG data and investment outcomes. Better ESG data will lead to a better understanding of the ESG risks for corporations and sectors, higher reporting standards, and will enhance capital allocation based on inherent sustainability risks.

Data quality and assessment

To safeguard data quality and useability, our evaluation process plays an integral part in the creation of the LGIM ESG score. The choice of indicators focuses on identifying material risks and opportunities in three key areas:

Reportability: Availability of the data point

Measurability: Ensure that the metrics are quantified numerically

Reliability: Ensure that data is reported consistently to enable comparisons across relevant companies

The themes across the LGIM ESG pillars (see Figure 1) are closely linked to the LGIM Investment Stewardship team's engagement with investee companies, policymakers, stock exchanges and index providers, on behalf of the end investors in such portfolios, to address company-specific and market-wide risks and opportunities. These range from combating climate change to upholding investor rights.

Data coverage

ESG data coverage has expanded tremendously across sectors, industries and regions; the quality of the data is critical for meaningful assessment and integration into an investment process. Without a framework or process for data quality assurance, using the data is potentially risky and could lead to misguided conclusions.

This also applies to the general ESG reporting of investee companies. A company that reports inaccurately, or has inaccurate ESG metrics provided by a third party, can have a material impact on ESG scores and capital allocation. Using unreliable ESG data can paint an inaccurate picture of a corporate profile, as well as impact decisions on engagement and investments. Hence data quality is critical to ensure that what is collected and analysed is fit for purpose for the ESG scores and the index design process.

We studied the historical data coverage from various providers across standard equity and fixed income benchmarks, particularly cap-weighted indices. In this research paper we will focus mainly on equity benchmarks as they provide a representation of listed companies globally. A more focused piece on fixed income will follow in a series of publications using our historical data over the past decade and a half.

All equity benchmarks have seen pronounced improvements in ESG data coverage, and coverage is now 95-100% globally. While developed markets (DMs) have richer data coverage than emerging markets (EMs), the latter have seen the most profound improvements in ESG data coverage. This expansion signals a global recognition of ESG's relevance outside DM regions.

We also looked at the individual indicator coverage through the history in our database. Notably, data on green revenues — a measure of a company's income from green activity (e.g. renewable energy) — has tripled in the past 15 years in the global equity benchmark, being available for 18% of the global benchmark today.

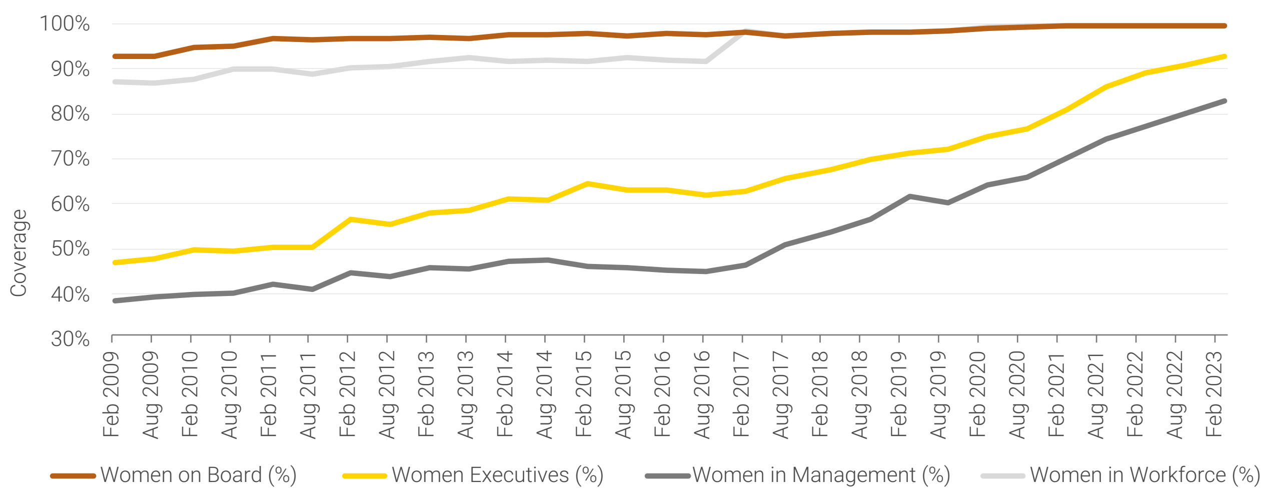
However, there remain areas for further development. While certain indicators, such as Scope 1 and Scope 2 emissions, have reached almost complete coverage in global benchmarks, others, such as biodiversity and green revenues, have room to grow. Still, the trajectory remains upwards, as evidenced by the progressive coverage increase of green revenues over the past decade.

Furthermore, sectoral coverage of ESG data has not only grown, but has remained consistently comprehensive in recent years. Consumer sectors, both discretionary and staples, along with the materials sector, have emerged as the champions in terms of coverage enhancement.

In sum, we've observed that the world of ESG data is richer and bigger than ever before. This growth not only aids investors in making informed decisions, but also pushes companies to be transparent and accountable in their ESG practices. With each year, the financial world is likely to move closer to fully embracing the ESG narrative, making it an intrinsic part of the global investment debate.

We have included Figure 2 as an example. It charts the evolution over time of coverage of data showing the percentage of women in the workforce generally and those in senior positions. While data on women on the board has been generally more available historically, data on women in senior, but non-board, roles has become more available only recently.

Figure 2. Data coverage on women in senior roles



Source: LGIM, data covering 2009-2023

Geographical trends: global and regional differentiation

Over the span of one and a half decades, the ESG landscape has witnessed an extraordinary evolution that underscores the growing importance of environmental, social and governance factors in corporate practices.

We have focused here on underlying market capitalisation benchmarks. However, there are variations of these benchmarks that tilt and optimise towards high ESG outcomes. The Future World index family is one example.

LGIM's Future World index family

ESG score

Assets linked to the scores and index family today exceed **£45.5bn**[3]

Over **40** funds and more than **2,000** clients within the Future World range[4]

With clients across **four continents** (North America, Europe, Asia and Oceania)

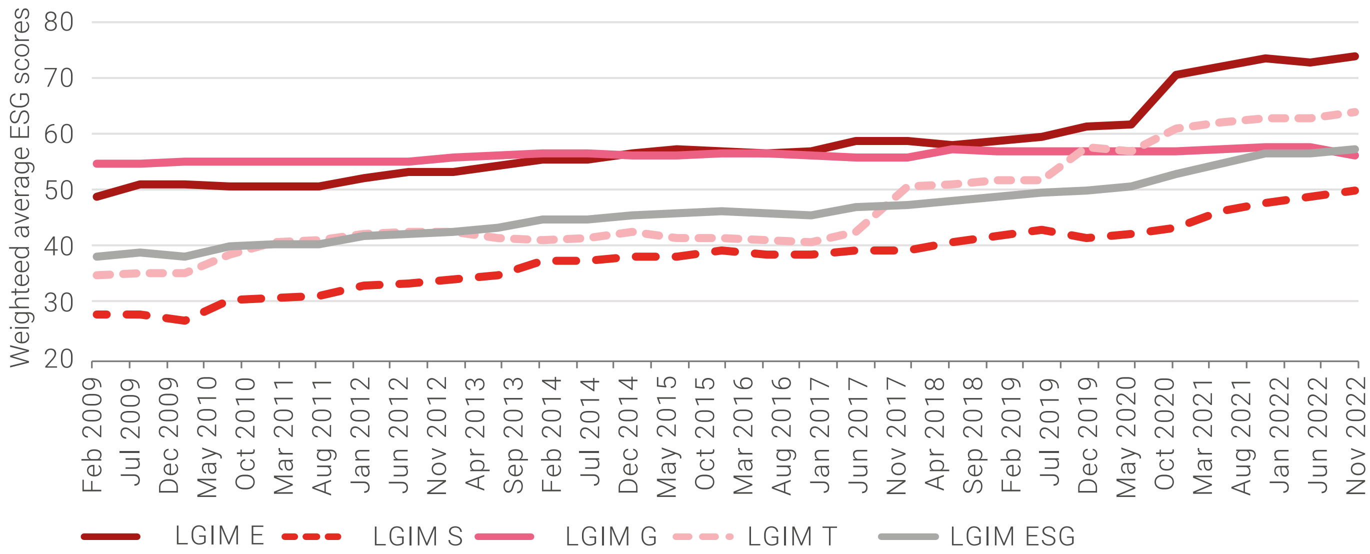
3. Source: LGIM, as at 30 June 2023.
4. Source: LGIM, as at 30 June 2023.

Global trends

This transformative ESG journey is evident in the remarkable increase of aggregated ESG scores, which surged by 50% from 2009 to 2023 (our full history of data). This reflects the broader global movement towards sustainable business practices. Interestingly, in the more recent five-year timeframe, it has become evident that the pace of ESG progress has accelerated even further. In the last five years, the ESG overall score has increased by around 19%.

Although the changing composition of the global equity benchmark had an impact on ESG score improvement, the overall trend of strong progress remained when we controlled for this effect by using an equally weighted benchmark. See the 'Alternative weighting schemes' section of the data appendix to learn more.

Figure 3. Global ESG and transparency trends



Source: LGIM as at September 2023

Pillar score changes over time

	Historical period	Live period			
Scores	**Feb 2009**	**Mar 2018**	**Mar 2023 (latest period)**	**Cumulative change (Feb 2009 vs latest period)**	**Cumulative change (March 2018 vs latest period)**
LGIM E	49	59	74	51%	25%
LGIM S	28	39	50	81%	28%
LGIM G	55	56	56	3%	1%
LGIM T	35	51	64	84%	26%
LGIM ESG	38	48	57	50%	21%

Source: LGIM as at September 2023

Over the long term, the biggest drivers of this increase are E, S and T (transparency). These individual pillar scores grew by 51%, 81% and 84%, respectively, or had an average annual increase of 2.9%, 4.2% and 4.3%, respectively. To put these metrics in tangible terms, the increase in the S score is reflective of a rise in the percentage of women on boards from 13% to 30% over the past 15 years, with an annual average rate of 5%.

Such rapid advancement underscores the rising commitment of businesses to addressing environmental concerns and social issues.

Conversely, governance scores have remained broadly flat, as the base level for governance was relatively high compared with the other pillars.

We conducted further analysis on the global benchmarks to ensure that the trend is consistent and to determine to what extent the composition of the benchmarks had an impact on the trends. We created an equal weighting of all benchmarks and distilled the common constituents that have been in the benchmark through the various periods going back 15 years and over shorter periods. The outcome of this analysis was that the trends remained persistent, despite the weighting of the companies in the benchmark. See the data appendix for more details.

Regional trends

The global trend of steady ESG improvement is echoed in individual regions, but different stories emerge. Each region's trajectory is influenced by an intricate interplay of benchmark composition, market dynamics and the increasing adoption of sustainability standards among listed companies.

Notably, North America, which represents the biggest share of the global benchmark, is an example of a country that has achieved a consistent rise in its ESG scores, shaped by a blend of a cultural shift towards valuing sustainability and corporate accountability. This is particularly noteworthy given the sometimes polarised political stance in the US on ESG – the data paints a clear picture that positive progress is being made nonetheless. North America exposure increased in the global benchmark over time, but also displayed a positive trend in the underlying company scores in aggregate. While its exposure over time in the global benchmark increased by around 15 percentage points from c. 49% in 2009 to c. 64% in 2023, the regional ESG score for North America grew by c. 47% across the whole history considered. For more details on the attribution of individual regions, see the data appendix.

Among the global ESG frontrunners, Japan stands out as an exemplar of rapid and robust ESG advancement. Over the past 15 years, Japanese corporations have demonstrated an exceptional doubling of their ESG scores, albeit having started at a lower base than any other region. This trajectory can be attributed to a combination of regulatory encouragement, heightened investor demand for responsible conduct, and societal pressures for enhanced corporate responsibility.

However, a closer examination shows a remaining challenge: despite the jump in women on the board of Japanese companies from 1% in 2009 to 14% in 2023, this still trails behind other regions. This underlines the persistent quest for gender parity and diversity in leadership roles.

The UK has also made remarkable progress, with its social scores soaring 91% over the whole period, and 42% from the live period in March 2018 (see chart below) for source information). This achievement reflects significant strides towards gender equality and the elevation of women's representation in leadership positions.

EMs, meanwhile, have embarked on an upward trajectory since the COVID-19 pandemic, contributing to the global shift towards sustainable practices and responsible business operations. Historically, EMs have lagged behind DM regions.

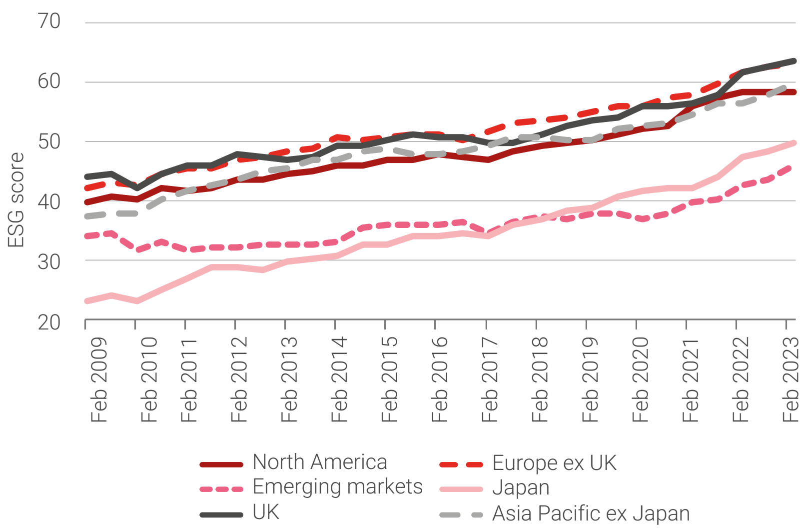
Data has been considered on a global, regional and sector basis. In the analysis we focused on the traditional six regions, five of which are DM groups. We also considered DMs versus EMs.

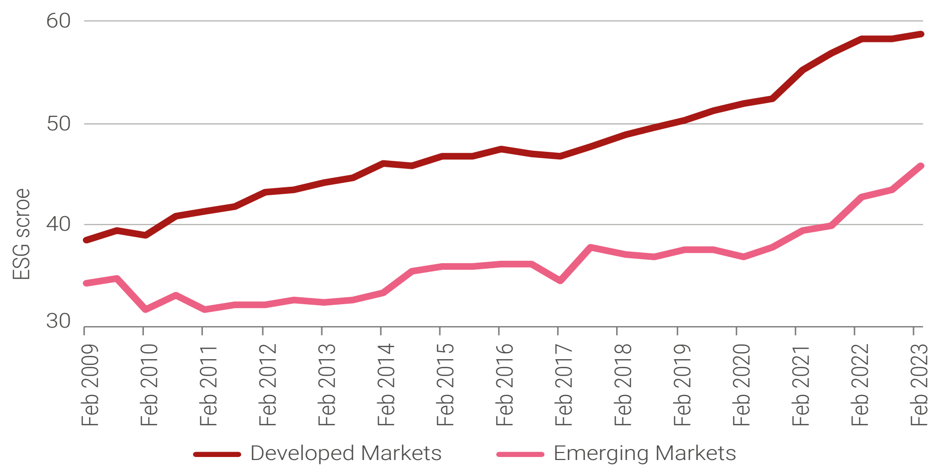
Examining the most recent five-year span unveils intriguing dynamics. Both Japan and the UK have seen higher ESG scores, yet their contributions to the overall ESG index have receded.

This interplay highlights the intricate relationship between regional growth and the broader global ESG landscape. As countries strive for heightened ESG performance, their impacts intertwine with the greater global narrative, revealing the complex tapestry of interconnected progress.

In sum, the global ESG journey encapsulates a myriad of pathways, each propelled by unique combinations of regulations, investor demands, societal pressures and cultural shifts. These regional trajectories, from North America's consistent rise to Japan's exponential growth and the UK's remarkable achievements, underscore the diverse challenges and opportunities that characterise the pursuit of sustainable and responsible business practices.

Figure 4. Regional ESG score trends and DM vs EM





Source: LGIM as at September 2023. For more details see the data appendix

Sector trends and distinctions

We performed a deep dive into sectors across all equity benchmarks. Examination of the sectoral ESG landscape reveals intricate patterns and differentiations, similar to the regional benchmarks. Among the sectors that stand out are utilities and materials, which displayed pronounced improvements in their environmental scores over the past 15 years.

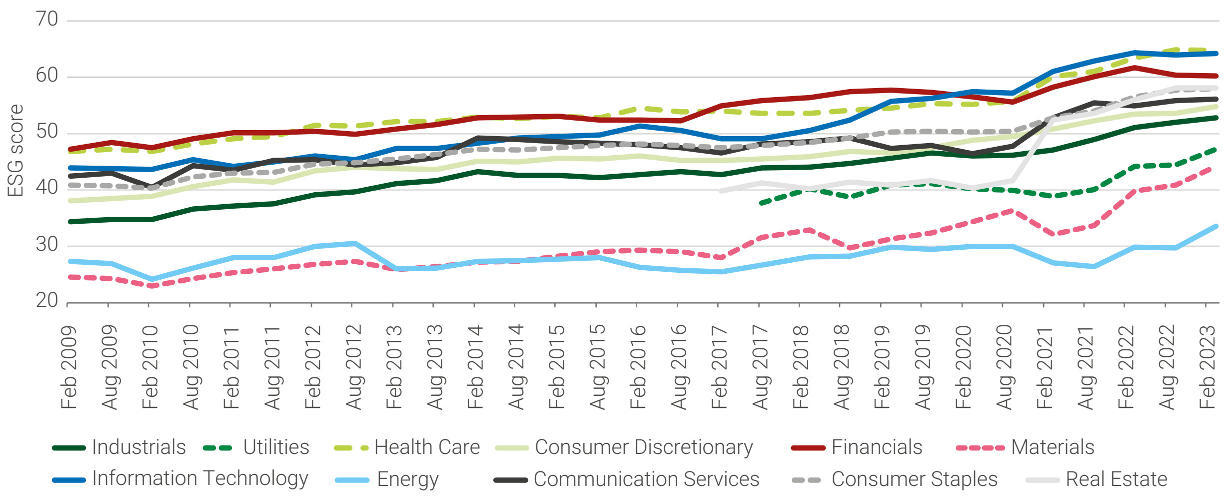
This evolution is intrinsically linked to the global call for an energy transition and the pressing need to reduce carbon footprints. Furthermore, the transformation within these sectors reflects the urgency of addressing environmental concerns and adopting sustainable operational methodologies.

The leading sectors

The data shows that the utilities and materials sectors were frontrunners in environmental score improvements, with scores almost tripling since 2009. Meanwhile, the consumer discretionary sector has displayed a positive trend in the transparency score over the last decade, indicating enhanced disclosure practices.

Similarly, the information technology sector also stands out, particularly over the past five years, due to its progress in grappling with ESG challenges intrinsic to the digital revolution – rising by 27% from a score of 51 to 64 (see chart for source information).

Figure 5. Sector ESG scores



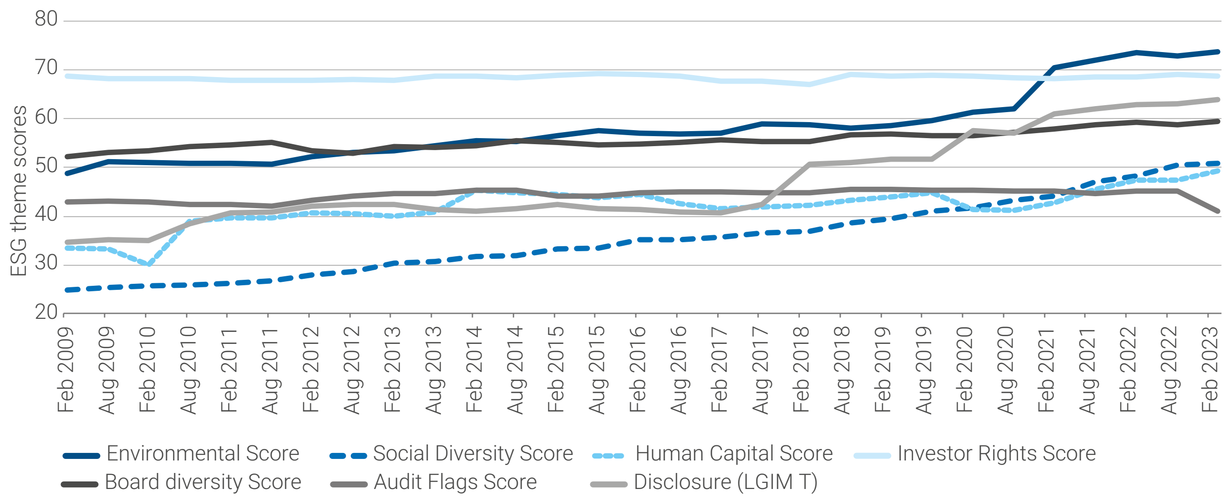
Source: LGIM as at September 2023.

Trends in engagement themes and indicators

Having looked at the ESG trends with geographical and sectoral lenses, we investigated the themes that emerged based on our historical data. Our ESG scores encapsulate various pillars that reflect important ESG themes – see Figure 1.

The historical data show that the biggest increase within the various ESG themes comes from social diversity. This is followed by disclosure (transparency), emission and transition themes, with the environmental domain followed by human capital and labour rights. Note that the score structure has evolved over time, and that some themes and indicators were not available historically, for example nature, which includes biodiversity, deforestation and water management.

Figure 6. Engagement theme evolution



Sources: LGIM, Sustainalytics, ISS, HSBC Green Revenue, Refinitiv, MSCI ACWI. For more details on the changes see the data appendix

Social diversity

Social diversity captures one of the most significant shifts, reflecting an increased focus on gender equality. Since 2009, there has been a dramatic shift in boardrooms across the globe. The representation of women in leadership positions, specifically on boards, has jumped from 13% to 30%. Such a shift reflects a broader societal trend of greater gender parity, diversity and inclusion in workplaces – see deeper discussion below: 'The link between scores and underlying data'.

Transparency

Disclosure and transparency themes, such as ESG reporting standards and the verification of ESG reporting scores, improved by 40% and 30%, respectively, during the full history of the data, an annual average rate of c. 3% and c. 2%, respectively. The scores are directly related to the underlying indicator, which increased during this period as well. Additional details are included in the appendix.

The environment

Environmental issues have undeniably come under an intensified global spotlight. As concerns over climate change, biodiversity loss and pollution escalate, demand for corporations to step up their environmental responsibilities mounts. This explains the annual average growth of 3% within the E pillar, with companies increasing their efforts in sustainable resource management, energy efficiency and waste reduction.

When it comes to ESG-themed improvements, certain pivotal drivers stand out, acting as catalysts of transformative change. The journey of ESG over the past 15 years is a testament to the evolving landscape of responsible corporate practices on key themes.

We've observed that ESG scores at various levels have headed in the same direction, with the environmental, social and transparency pillars acting as pivotal drivers of change. Regional variations have led to a diverse range of ESG trajectories, from the consistent climb of North America to the rapid growth of Japan and the ascent of emerging markets. At the sectoral level, utilities and materials have addressed environmental concerns, while the consumer discretionary and technology sectors have excelled in transparency and adaptation to the digital age. Collectively, these trends reflect a complex, yet promising, global ESG landscape.

Lessons from the past and for the future

Throughout our five-year journey with the LGIM ESG scores and integration into systematic investment processes, we've made several important observations:

Awareness leads to action:

The continuous growth of ESG scores over time demonstrates that when companies and investors become aware of environmental, social and governance issues, they are likely to come under public pressure to take action. The increasing attention on these areas, both from regulatory bodies and the public, has played a role in prompting tangible changes in company behaviour.

Transparency builds trust:

The rise in our transparency scores reveals that openness and clear communication are being prioritised. Companies have realised that stakeholders, including investors and consumers, value transparency, which fosters trust and can enhance a company's reputation, making it more appealing to both investors and consumers.

Diversity is crucial:

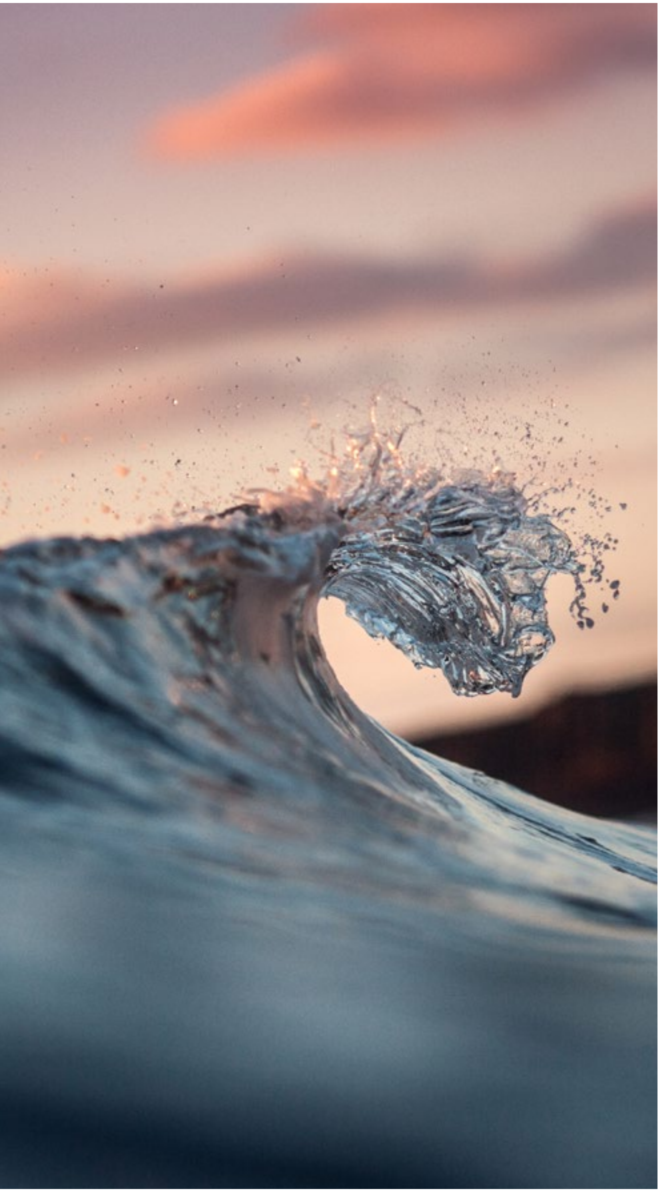
One of the most notable shifts has been in the role of women in leadership, leading to a rise in the S component of our ESG score. The significant growth in the percentage of women on boards indicates the increasing recognition of the value of diverse perspectives in decision-making. It stresses the importance of inclusivity for improved business outcomes as well.

Regional variances matter:

Different regions have different challenges and priorities. While Japan and the UK showed remarkable improvements, it's evident that each region's historical, cultural and economic context plays a role in determining its ESG trajectory.

Sustainable practices are the future:

Companies are recognising that to remain viable over the long term, addressing global challenges such as climate change, and seeking opportunities within these challenges, is not only desirable, but necessary.



Where do we go from here?

So, what does this mean for investors? The developments in ESG data directly affect the investment landscape, providing investors with comprehensive tools for analysis in various areas. At LGIM, we engage with data providers to drive improvements in data availability, quality and coverage, and to improve understanding of what we require as investment managers in order to be able to use a data set. For example, regarding deforestation data, in collaboration with other Finance Sector Deforestation Action (FSDA) signatories, we have written to data providers to engage and work with them on further developing their offering, particularly in relation to an increased set of key commodities.

Within climate and the environment, the availability of data and its improved quality are key. With the availability of both data on green revenues and emissions, for example, investors of various types are better able to evaluate the environmental impact of their investments. The social pillar helps investors consider the social responsibilities of corporates, ensuring diversity and labour rights are considered within the investment framework.

Finally, within the governance and transparency framework, the increase in verification and transparency metrics ensures that investors have access to reliable data, reflecting the governance practices of companies.

These observations underscore the practical implications of ESG developments, shaping the future of sustainable investing. As ESG data continues to evolve and to improve in quality and scope, this will help us evolve our engagement campaigns and our ESG scores, enabling us to add new metrics over time, to capture developments across markets, and to reflect the increased intensity of focus on ESG factors among investors and our clients.

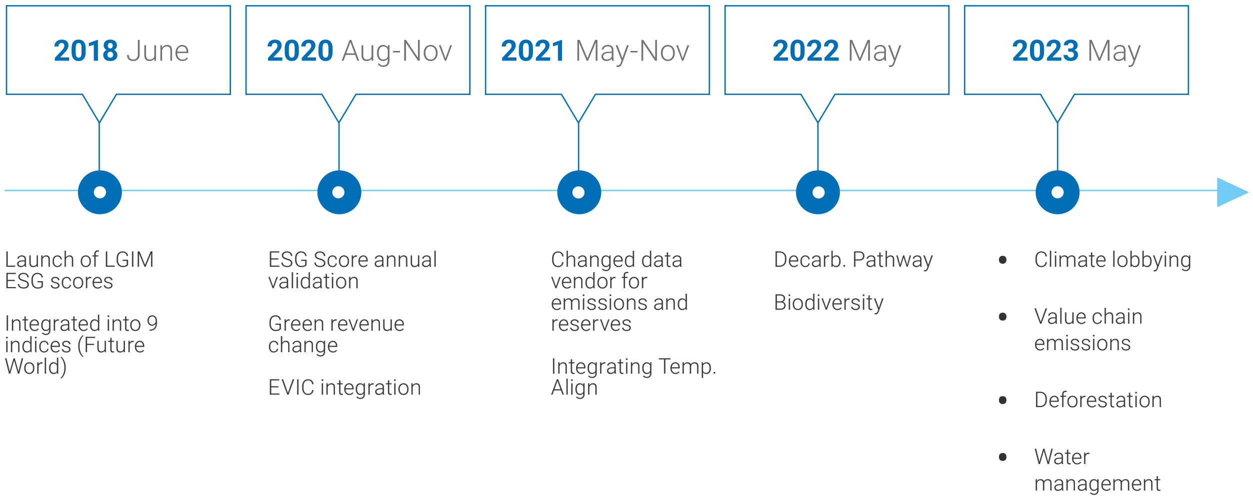
Appendix and insights into the analysis

The content of the document is based on LGIM ESG scores and underlying historical data. ESG scores are annually reviewed, and there has been a sequential evolution and enhancement of the score structure since the initial launch of the LGIM ESG score in 2018.

ESG scores and underlying data

The latest available indicators upon which the ESG scores are based can be found in the publicly available methodology document.

Figure I – Evolution of the LGIM ESG score



Source: LGIM as at September 2023.

The LGIM ESG score captures a number of themes across various pillars, as illustrated in Figure 1 in the main section of this report.

Throughout the analysis we have used as our starting universe a wide global market-capitalisation index comprising large- and mid-cap securities. Results are based on MSCI ACWI semi-annual data from 2009 to 2023 for a total of 29 periods:

- end of February and August from 02/2009 to 08/2017
- end of March and September from 03/2018 to 03/2023

The change in month was due to the availability of historical scores and the timing in current operating processes used to generate our ESG scores, which was set up in 2018.

Historical period start	Live period start	Latest period
Feb 2009	Mar 2018	Mar 2023

Data was partitioned into six regions, with five developed markets – North America, Europe ex-UK, UK, Asia-Pacific ex-Japan, Japan – and emerging markets. The data accounts for historical country changes, such as Israel's promotion from emerging markets in 2010 and Greece's demotion from the Eurozone in 2013. Sector classification is GICS.

Figure II – Regions and sectors

Region	Market
North America	Developed markets
Europe ex-UK	Developed markets
UK	Developed markets
Asia Pacific ex-Japan	Developed markets
Japan	Developed markets
Emerging markets	Emerging markets

GICS sector
Energy
Materials
Industrials
Consumer discretionary
Consumer staples
Health care
Financials
Information technology
Communication services
Utilities
Real estate

Source: LGIM as at September 2023.

Metrics and analytics

General results are based on money-weighted portfolio average aggregation. When calculating weighted averages, there is an implicit assumption on missing data, which is assumed to be equal to the (weighted) average of the portion of the portfolio with available data. The same assumptions hold when calculating attributed averages (e.g. regional, sector), which are derived on carve-outs from the global market portfolio.

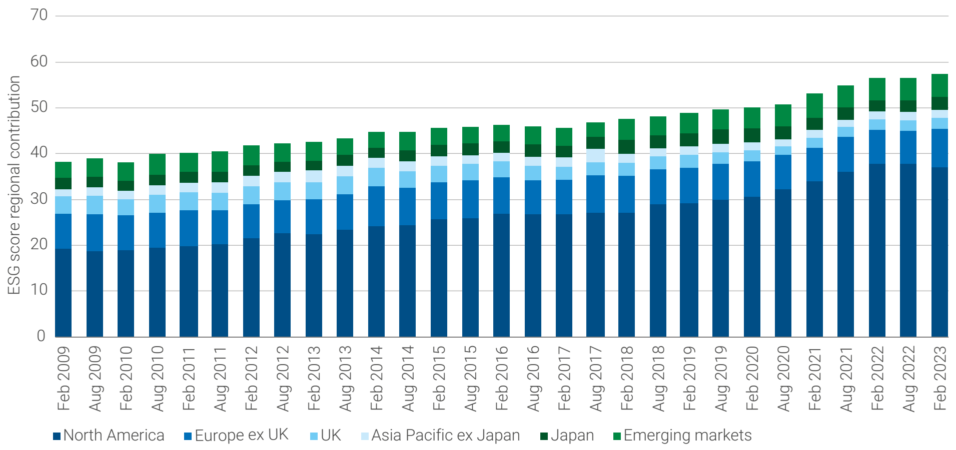
One way to attribute changes over time when considering portfolio weights is to break down the overall score between two components – the approach taken to illustrate changes in regions and sectors, for instance:

- Portfolio exposure across each category, over time
- Attribute score within each category, over time

Regional attribution

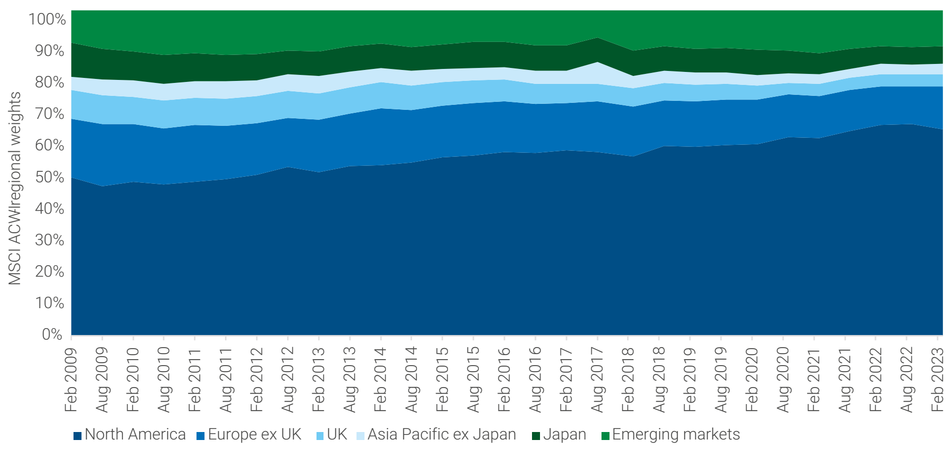
The ESG score and how it changes over time can be broken down into the sum of each regional contribution, as shown in Figure IIIa below.

Figure IIIa. ESG score – regional contribution



Source: LGIM as at September 2023.

Figure IIIb. MSCI ACWI – Regional exposure over time



Source: LGIM as at September 2023.

These score contributions are the result of the exposure evolution for each region over time, as shown in Figure IIIb, combined with the individual regional scores, which are calculated as a standalone carve-out of the global benchmarks illustrated in the main document in

Regional changes across the whole historical period and the live period are depicted in Figure IV below.

Figure IV. Historical pillar score changes in each region

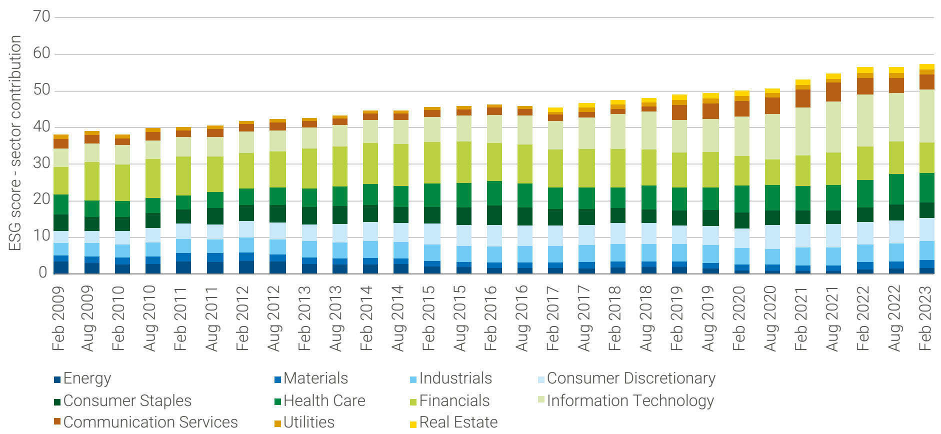
	Historical Period Start Period Start	Live Period Start	Latest -Period	Historical Period Cumulative Change	Live Period Cumulative Change	Historical Period Start	Live Period Start	Latest Period	Historical Period Cumulative Change	Live Period Cumulative Change
Regions	Feb 2009	Mar 2018	Mar 2023	Feb 2009 to Mar 2023	Mar 2018 to Mar 2023	Feb 2009	Mar 2018	Mar 2023	Feb 2009 to Mar 2023	Mar 2018 to Mar 2023
			ESG Score							
North America	40	49	58	47%	19%					
Europe ex UK	42	53	63	50%	18%					
UK	44	51	64	44%	25%					
Asia Pacific ex Japan	37	51	60	60%	18%					
Japan	23	37	50	112%	35%					
Emerging markets	34	37	46	34%	23%					
			E Score					G Score		
North America	49	60	77	59%	28%	55	57	56	1%	-3%
Europe ex UK	54	62	74	36%	20%	53	53	57	8%	9%
UK	46	56	67	46%	20%	63	65	68	7%	4%
Asia Pacific ex Japan	46	56	66	43%	18%	61	63	63	4%	1%
Japan	49	55	65	32%	17%	52	56	62	20%	11%
Emerging markets	42	55	63	51%	16%	50	46	49	-1%	7%
			S Score					T Score		
North America	30	40	51	68%	26%	27	48	60	126%	25%
Europe ex UK	32	52	62	92%	19%	53	65	76	44%	17%
UK	32	43	61	91%	42%	54	64	74	37%	16%
Asia Pacific ex Japan	25	45	58	129%	29%	45	58	75	66%	29%
Japan	11	20	34	198%	67%	25	38	58	133%	54%
Emerging markets	20	28	34	75%	23%	50	44	67	33%	51%

Source: LGIM as at September 2023.

Sectors attribution

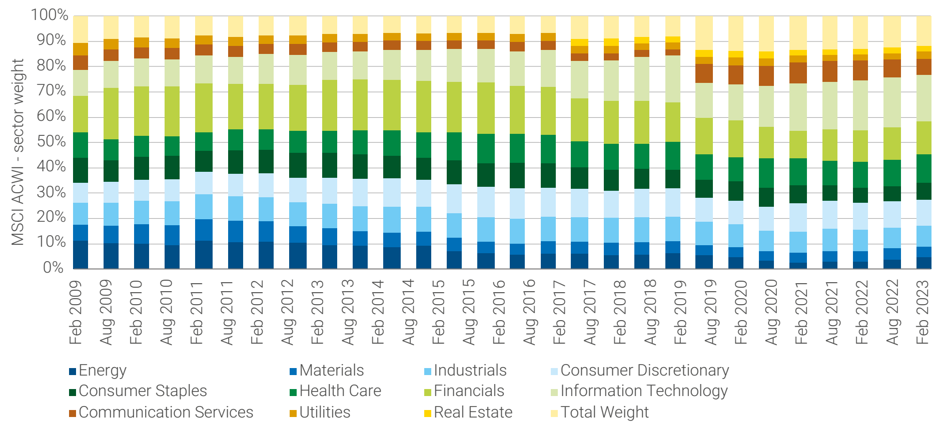
For example, the ESG score sector contributions over time shown in FigureVa result from the combination between the exposure of each sector over time, shown in Figure Vb, and sector (within-sector) ESG scores, which are calculated as a standalone sector's carve-out of the global benchmark and are illustrated in the main document in Figure 5.

Figure Va. ESG Score – Sector contribution



Source: LGIM as at September 2023.

Figure Vb. MSCI ACWI – Sector exposure over time



Source: LGIM as at September 2023.

4. Integration of climate green revenues data, available only past August 2017, has more significantly impacted utilities, and to a lesser extent the materials sector.

Sector changes across the whole historical period and the live period are depicted in Figure VI.

Figure VI. Historical pillar score changes in each sector

	Historical Period Start Period Start	Live Period Start	Latest Period	Historical Period Cumulative Change	Live Period Cumulative Change	Historical Period Start	Live Period Start	Latest Period	Historical Period Cumulative Change	Live Period Cumulative Change
Sectors	Feb 2009	Mar 2018	Mar 2023	Feb 2009 to Mar 2023	Mar 2018 to Mar 2023	Feb 2009	Mar 2018	Mar 2023	Feb 2009 to Mar 2023	Mar 2018 to Mar 2023
	ESG Score									
Energy	27	28	34	23%	20%					
Materials	25	33	44	80%	34%					
Industrials	34	44	53	53%	20%					
Consumer Discretionary	38	46	55	44%	20%					
Consumer Staples	41	48	58	42%	20%					
Health Care	47	54	65	38%	21%					
Financials	47	56	60	27%	7%					
Information Technology	44	51	64	46%	27%					
Communication Services	43	49	56	32%	16%					
Utilities		40	47		18%					
Real Estate		40	58		45%					
	E Score					G Score				
Energy	16	11	13	-18%	23%	55	56	56	1%	0%
Materials	12	22	35	204%	57%	55	57	59	6%	4%
Industrials	45	51	60	33%	18%	54	55	56	4%	3%
Consumer Discretionary	58	59	76	31%	28%	54	53	54	0%	2%
Consumer Staples	44	52	66	50%	26%	54	53	55	1%	3%
Health Care	60	69	87	47%	27%	55	57	57	3%	0%
Financials	82	84	86	6%	2%	56	58	57	2%	-2%
Information Technology	66	68	89	34%	30%	56	56	58	4%	3%
Communication Services	58	53	86	47%	62%	51	55	53	4%	4%
Utilities		31	39		26%	56	55	57	3%	4%
Real Estate		46	74		61%		56	56		1%
	S Score					T Score				
Energy	25	40	50	100%	23%	39	54	65	68%	22%
Materials	22	36	46	109%	29%	50	61	73	46%	20%
Industrials	22	37	46	105%	26%	29	47	65	124%	38%
Consumer Discretionary	25	36	44	76%	22%	26	42	59	126%	40%
Consumer Staples	33	44	56	72%	27%	32	57	66	104%	16%
Health Care	35	43	57	64%	34%	36	51	61	71%	19%
Financials	27	40	48	75%	21%	31	54	70	124%	30%
Information Technology	27	39	54	97%	37%	34	46	61	79%	33%
Communication Services	28	41	41	47%	2%	38	63	58	55%	-7%
Utilities	30	40	50	67%	25%	46	56	68	49%	22%
Real Estate		31	49		57%		46	67		46%

Source: LGIM as at September 2023.

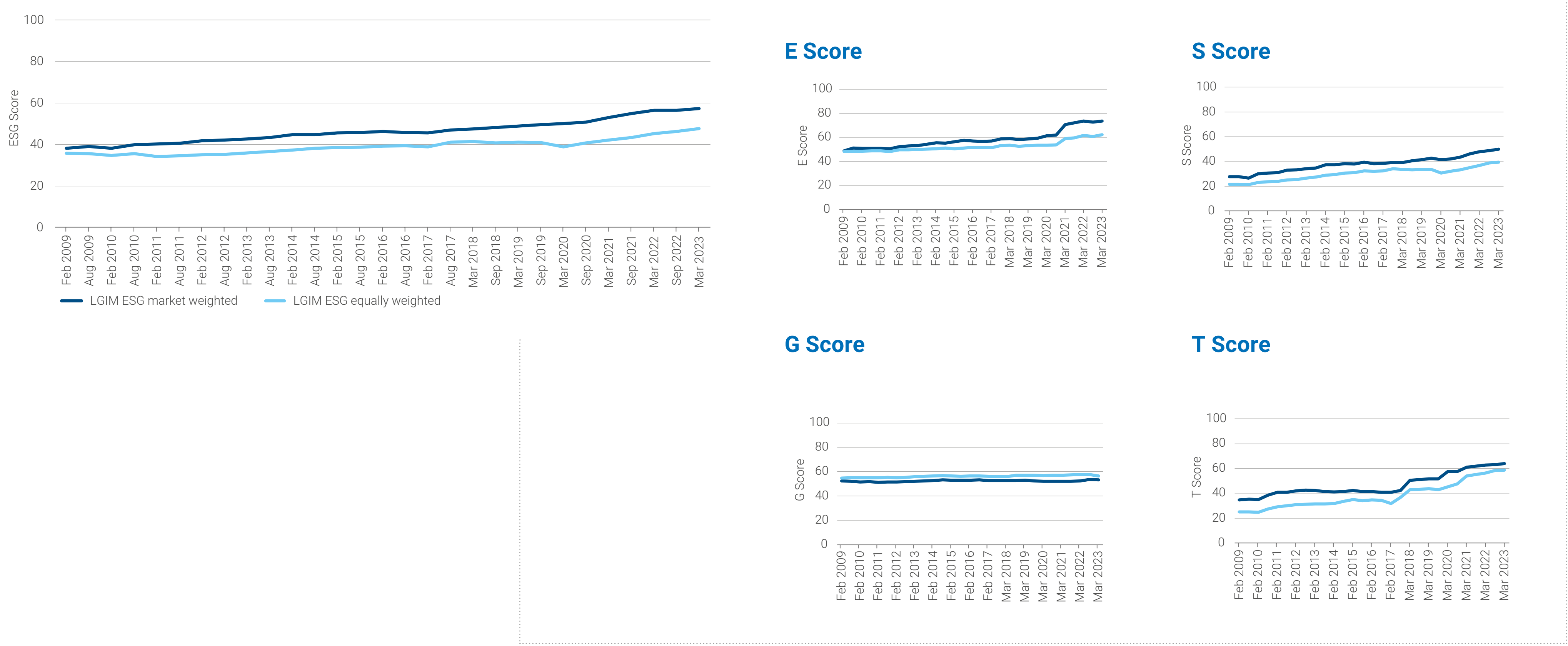
The same approach can be utilised to provide additional insights into sector evolution within each region, and for any of the pillars, themes or underlying indicators.

Alternative weighting schemes

While carrying out the analysis we focused on a money-weighted and market-cap weighted scheme. We also considered results from an equal-weighted alternative scheme to inform broader considerations. Although it is important to consider that market capitalisation and its evolution plays a role in overall ESG contributions, we note that overall, the pattern of ESG improvement persists after accounting for it.

We show the comparison between market-cap weighted and equally weighted pillar scores in Figure VII.

Figure VII. Market-weighted and equally weighted ESG scores



Source: LGIM as at September 2023.

Cumulative and annualised changes across the timeline considered are contrasted in the table below:[6]

	Cumulative Change 2009-2023			Average annual Change 2009-2023		
	Market-Weighted	Equally Weighted	Difference	Market-Weighted	Equally Weighted	Difference
LGIM E	51%	29%	22%	2.9%	1.8%	1.1%
LGIM S	81%	83%	-2%	4.2%	4.2%	-0.1%
LGIM G	3%	1%	2%	0.1%	0.2%	-0.1%
LGIM T	84%	134%	-50%	4.3%	6.0%	-1.8%
LGIM ESG	**50%**	**33%**	**17%**	**2.9%**	**2.0%**	**0.8%**

Source: LGIM as at September 2023.

Even after considering securities equally weighted, the increase in scores remains a broad pattern. The purpose of this exercise is to ensure that results are consistent, irrespective of the benchmark composition in different geographies.

Figure VIII. Equally weighted pillar scores over time

Date	LGIM E	LGIM S	LGIM G	LGIM T	LGIM ESG
Feb 2009	48	22	52	25	36
Aug 2009	48	22	52	25	36
Feb 2010	49	21	52	25	35
Aug 2010	49	23	52	27	36
Feb 2011	49	24	51	29	34
Aug 2011	48	24	51	30	35
Feb 2012	50	25	52	31	35
Aug 2012	50	25	52	31	35
Feb 2013	50	27	52	32	36
Aug 2013	50	27	52	32	37
Feb 2014	51	29	53	32	37
Aug 2014	51	29	53	33	38
Feb 2015	51	31	53	35	39
Aug 2015	51	31	53	34	39
Feb 2016	52	32	53	35	39
Aug 2016	52	32	53	34	39
Feb 2017	51	32	53	32	39
Aug 2017	53	34	53	37	41
Mar 2018	54	34	53	43	41
Sep 2018	53	33	53	43	41
Mar 2019	53	34	53	44	41
Sep 2019	54	34	52	43	41
Mar 2020	53	31	52	45	39
Sep 2020	54	32	52	48	41
Mar 2021	59	33	52	54	42
Sep 2021	60	35	52	55	43
Mar 2022	62	37	52	56	45
Sep 2022	61	39	54	58	46
Mar 2023	62	39	53	59	48

Source: LGIM as at September 2023.

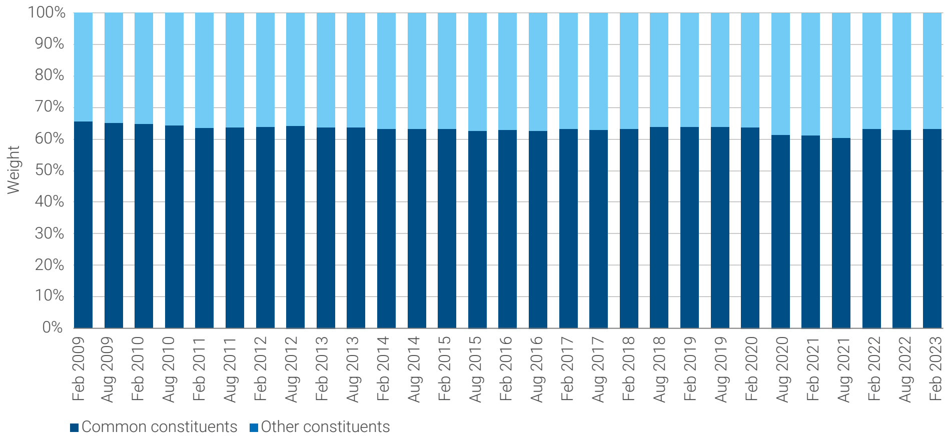
6. Cumulative change calculated (Score_final / Score initial)-1; Average annual change approximated as (1+ cumulative change)^(2/29)-1.

Benchmark constituent changes and impact

Within the period considered, we acknowledge that many securities have changed over time, with some coming out of the index, while others have increased their weightings.

With this in mind, we looked at the portion of the index with constituents available throughout the full history as a separate validation exercise. We found that c. 65% of exposure was common across the period 2009-2023. Although this percentage depends on the window selected, it further shows that there is an overall positive contribution from the common constituents in the index, consistent with the insights discussed throughout, as shown in Figures IXa, IXb and IXc.

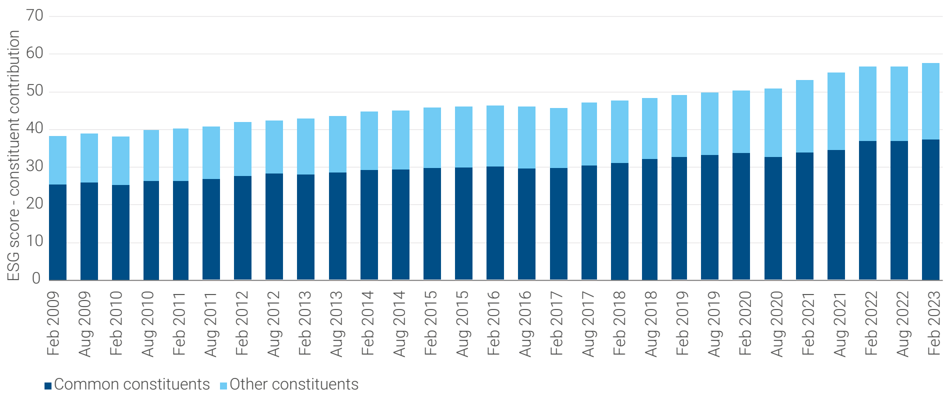
Figure IXa. Common exposure in market cap index through time



Source: LGIM as at September 2023.

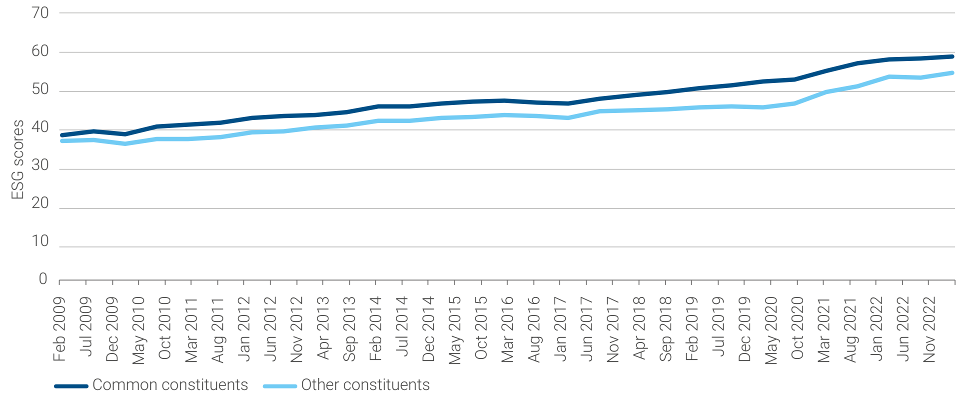
The contribution from the constituents common across the whole history shows an increase in ESG score (Figure IXb), given the broadly constant exposure over time shown (Figure IXa) and the upward trending ESG scores from common constituents, calculated as a separate carve-out of the benchmark (Figure IXc).

Figure IXb. Contribution to ESG from common and other constituents through time



Source: LGIM as at September 2023.

Figure IXc – ESG Scores of common and other constituents of the index



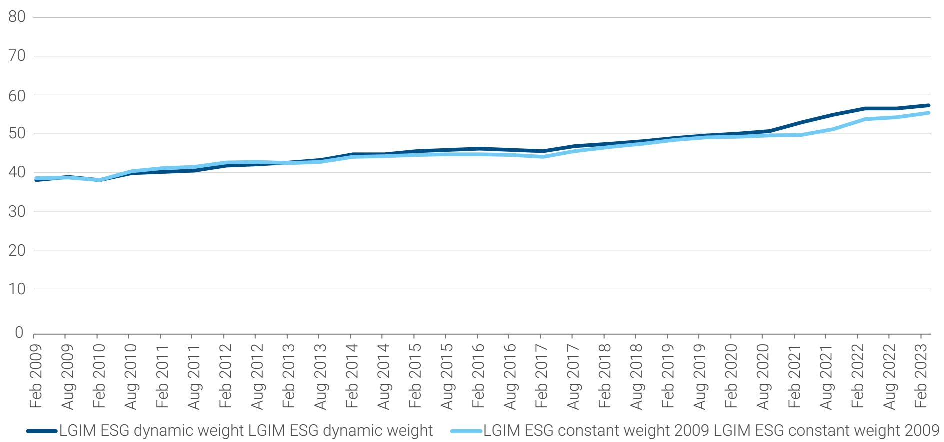
Source: LGIM as at September 2023.

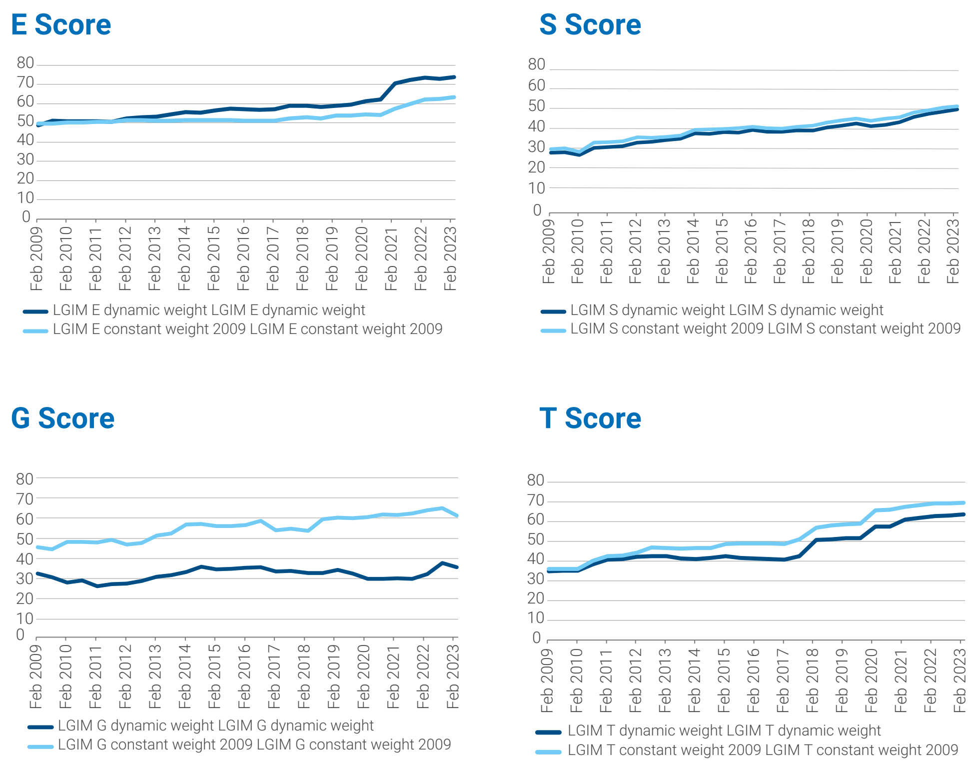
Constant constituents validation

Furthermore, we have performed a separate validation considering the evolution of ESG pillars with common constituents only across the period and at a constant weight equal to the initial period.[7]

The pattern of a general increase in scores persists, even after accounting further for market dynamics and index composition, confirming once more our broad conclusions.

Figure X. ESG scores over time with constant weight (2009)





Source: LGIM as at September 2023.

7. The portion of common constituents considered as a carve-out with constant weights from initial period 2009/02.

A summary of the changes is illustrated below.

	Cumulative Change 2009-2023			Average annual Change 2009-2023		
	Dynamic Weights	Constant Weights 2009/02	Difference	Dynamic Weights	Constant Weights 2009/02	Difference
LGIM E	51%	28%	24%	2.9%	1.7%	1.2%
LGIM S	81%	75%	6%	4.2%	3.9%	0.3%
LGIM G	1%	6%	-4%	0.1%	0.4%	-0.3%
LGIM T	84%	94%	-11%	4.3%	4.7%	-0.4%
LGIM ESG	**50%**	**43%**	**7%**	**2.9%**	**2.5%**	**0.3%**

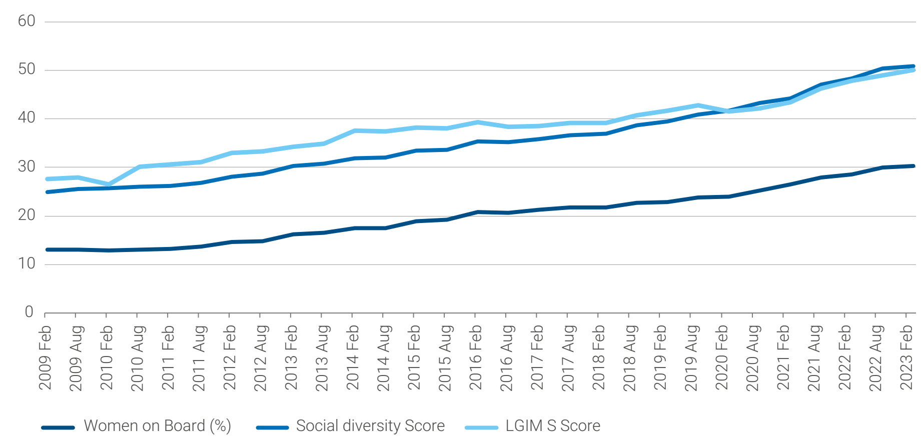
Source: LGIM as at September 2023.

The link between scores and underlying data

The analysis and the insights illustrated throughout this document focus on the LGIM ESG scores and general patterns that have emerged over time. The scores are constructed using a dedicated framework and are based on multiple indicators, and looking at their evolution over time can provide useful insights. The evolution of the underlying data can be a valuable proxy, as they are constructed with upward aggregation from indicators to themes and then pillars.

One example is the gender diversity score, which is based on indicators of women's participation at different levels of corporate seniority. The chart below shows the expected commonality between the percentage of women sitting on the board (one of social diversity indicators), the social diversity score (theme score) and the broader LGIM S score (pillar score) and how they have changed over time.

Figure XI. Women on the board and social diversity – S score



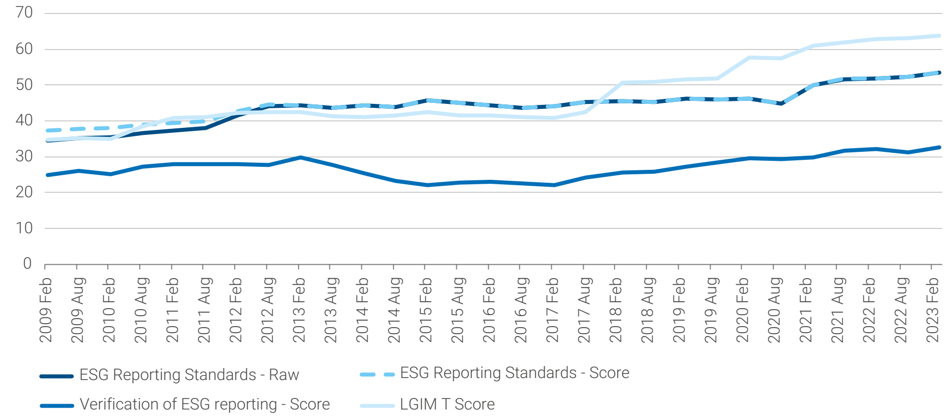
Source: LGIM as at September 2023.

	Historical Period Start	Live Period Start	Latest Period	Historical Period Cumulative Change	Live Period Cumulative Change
Regions	Feb 2009	Mar 2018	Mar 2023	Feb 2009 to Mar 2023	Mar 2018 to Mar 2023
Women on Board (%)	13	22	30	131%	39%
Social diversity Score	25	37	51	105%	38%
LGIM S Score	28	39	50	81%	28%

Source: LGIM as at September 2023.

Similarly, we can see another example in the patterns of two indicators in the transparency pillar and the evolution of the pillar LGIM T score, as depicted below.

Figure XII. ESG reporting standards and verification of ESG reporting in T score



Source: LGIM as at September 2023.

	Historical Period Start	Live Period Start	Latest Period	Historical Period Cumulative Change	Live Period Cumulative Change	Historical Period Annualised Change	Live Period Annualised Change
Regions	**Feb 2009**	**Mar 2018**	**Mar 2023**	**Feb 2009 to Mar 2023**	**Mar 2018 to Mar 2023**	**Feb 2009 to Mar 2023**	**Mar 2018 to Mar 2023**
ESG Reporting Standards - Indicator	35	46	53	55%	17%	3%	1%
ESG Reporting Standards - Score	37	46	53	43%	17%	2%	1%
Verification of ESG reporting - Score	25	26	33	31%	28%	2%	2%
LGIM T Score	35	51	64	84%	26%	4%	2%

Source: LGIM as at September 2023.

Developed and emerging markets

Although emerging markets generally lag behind in terms of the level of ESG standards, compared with developed markets, there has been an increase over time in their ESG score.

Figure XIII. ESG score change in developed and emerging markets

	Historical Period Start	Live Period Start	Latest Period	Historical Period Cumulative Change	Live Period Cumulative Change	Historical Period Annualised Change	Live Period Annualised Change
Regions	**Feb 2009**	**Mar 2018**	**Mar 2023**	**Feb 2009 to Mar 2023**	**Mar 2018 to Mar 2023**	**Feb 2009 to Mar 2023**	**Mar 2018 to Mar 2023**
Developed markets	39	49	59	52%	20%	2.9%	1.3%
Emerging markets	34	37	46	34%	23%	2.0%	1.4%
Global markets	38	48	57	50%	21%	2.9%	1.3%

Source: LGIM as at September 2023.

Themes: results

We include the evolution of scores for themes in Figure XIV below.

Figure XIV. ESG themes, historical and live period changes

ESG Themes	Long Term Changes (Feb 2009)	Medium Term Changes (from March 2018)
Environmental Score	51%	25%
Social Diversity Score	105%	38%
Human Capital Score	47%	17%
Investor Rights Score	0%	2%
Board diversity Score	14%	7%
Audit Flags Score	-4%	-9%
Disclosure (LGIM T)	84%	26%

Source: LGIM as at September 2023.

Contact us

If you have further questions about the research behind this paper, or want to know how the LGIM scores feed into the Future World family of indices, please don't hesitate to get in touch with us.

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Key risks

The value of investments and the income from them can go down as well as up and you may not get back the amount invested. Past performance is not a guide to future performance.