NORTHERN TRUST
ASSET MANAGEMENT

SUSTAINABLE INSIGHTS

EMERGING MARKETS — DATA FOR DECARBONISATION

EXPLORING HOW DATA CHOICES IMPACT PORTFOLIO DECARBONISATION WITHIN EMERGING MARKETS

IVAN RUMYNIN
Sustainable Investing Specialist

VALERIA DINERSHTEYN
Director of Sustainable Investment
Client Engagement International

Data and data quality are key determinants of sustainable investing across all regions, and an investor is ultimately limited to data available from providers. While this impacts all regions and asset classes, the issues are particularly acute within emerging markets (EM). This paper investigates some key considerations for institutional investors when investing in this space, particularly through the lens of balancing EM exposure within an asset allocation utilizing a total carbon budget.

Here are four key takeaways that we explore further:

1. We believe decarbonisation must be approached holistically, across both developed market (DM) and EM allocations. We dig into China as an example of how a country's seemingly arbitrary placement in an index can impact emissions.
2. Taking data at face value can lead to misunderstanding the true nature of what is happening in the real world. We explore this concept through country and sector weights, as well as financials.
3. From a decarbonisation perspective, absolute emissions metrics are perhaps more useful in EM vs. DM countries, as intensity-based metrics are more prone to impacts by the financials in the denominator as well as foreign exchange (FX) rates.
4. In the end, while EM still lag behind DM from a reporting perspective, implementing EM decarbonisation is practically not dissimilar to DM decarbonisation.

The carbon budget balancing act

For many investors, including institutions, investing in EM is necessary to achieve diversification within a broad portfolio and gain exposure to differing markets. At the same time, decarbonisation is also necessary to achieve interim and long-term carbon reduction commitments, as well as to mitigate the notable risks associated with the carbon transition. The question is how to balance this need for diversification while endeavoring to decarbonise a portfolio across both developed and emerging markets?

More specifically, due to the nature of the economic cycle of most emerging markets, investors may be exposed to higher emitting sectors with less stringent emissions regulations. However, many of these sectors are in dire need of investment to improve infrastructure and reduce greenhouse gas (GHG)

emissions and are where investors have the potential to make great impacts on global GHG emission reductions. It's also important to note that EM emissions are much lower per capita compared to DM emissions[1], and that data cannot be taken at face value — which we dig into in greater detail in the next section.

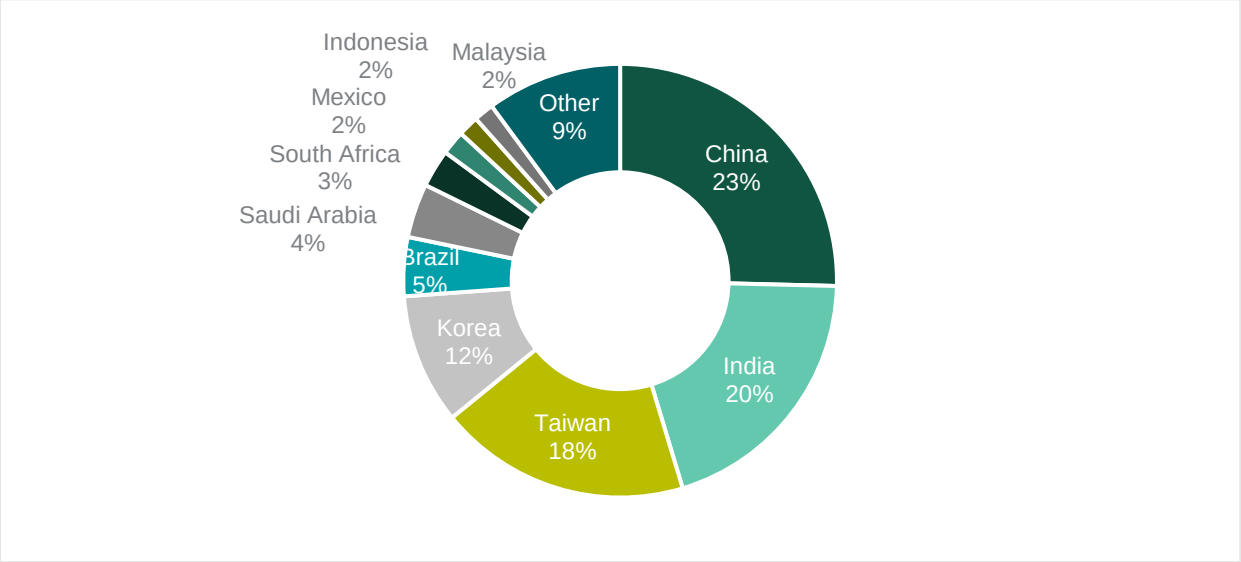
Data can tell many stories

First, it's important to understand what we're talking about when we talk about EM, as investors are often limited to external definitions and interpretations of the EM universe. The carbon footprint of allocations is inevitably impacted by these interpretations. Whilst an option could be to create a proprietary starting universe of EM countries, it is generally more efficient to use a standard index, thus ensuring decarbonisation is looked at holistically across both DM and EM allocations. For the purposes of this piece we use the MSCI EM Index. However, it is important to note that at Northern Trust Asset Management (NTAM), we create solutions that can be applied to different benchmarks across DM and EM allocations.

Next, it is important to be conscious of your starting universe — which countries are even considered "emerging" economies? The European Union (EU) and the United States (US) dominate standard market DM indices. In EM, the picture is more disparate. The top 10 countries within the standard MSCI EM Index are represented in **Exhibit 1**. Whilst this picture is broadly similar across other index providers, FTSE and S&P classify South Korea as a DM, an important choice given it is the fourth biggest contributor to the MSCI EM Index. Despite broad market reforms, MSCI maintained South Korea as an EM in its latest Market Classification Review, driven in part by the country's ban of the short selling of stocks. Ultimately the countries included or excluded determine the materiality of environmental, social and governance (ESG) factors within the universe and impact on a portfolio's carbon budget. In many ways, the starting universe is an arbitrary jumping off point.

EXHIBIT 1: BENCHMARKS ARE A JUMPING OFF POINT

MSCI EM Index Top 10 Country Weights



Source: MSCI. Data as of November 30, 2024.

[1] Friedlingstein, P. *et al.* (2023). Global Carbon Budget 2023. Earth System Science Data. 15. 5301-5369. 10.5194/essd-15-5301-2023.

China matters

To illustrate how arbitrary allocation of countries to DM or EM impacts carbon footprint, let's look at China. The case is often raised to separate China from EM indices given the extent of China's overrepresentation in the benchmark combined with the divergence of its equity markets from the rest of the region. As **Exhibit 2** illustrates, removing China from the EM benchmark has a notable impact on raw emissions — total EM emissions drop by over 50% across all scopes. Furthermore, there are also improvements in carbon intensity using both sales and enterprise value including cash (EVIC). This has significant impacts on a portfolio's allocation decisions if total carbon budget is an important factor in deciding EM vs. DM weights.

EXHIBIT 2: CHINA'S IMPACT ON EMISSIONS

Comparing Emissions in MSCI World Index to MSCI EM Index and MSCI EM Index (ex-China)

Emission Scope	Metric	MSCI World Index	MSCI EM Index	MSCI EM Index (ex-China)
Scopes 1 & 2	Total (bn tons)	4.11	8.04	3.19
	% Reported (no. companies)	83%	76%	83%
	WACI (t/$m Sales)	96.9	312.3	266.4
	EVIC Intensity (t/$m EVIC)	35.1	120.3	91.4
Scope 3	Total, Estimated (bn tons)	31.1	26.6	12.2
	Total, Blended* (bn tons)	43.7	28.7	13.9
	% Reported (no. companies)	75%	39%	58%
	% Reported (in blended**)	29%	13%	20%
	WACI (t/$m Sales)	668.8	925.6	745.4
	EVIC Intensity (t/$m EVIC)	298.2	546.6	441.8

Source: MSCI. Data as of November 30, 2024. Notes: *****Blended dataset uses a combination of reported and estimated figures. Reported is only used when MSCI has sufficient confidence in the number (and the value is at least 80% of the estimated number). ******Essentially, the share of companies where the reported figure is considered of sufficient quality for use in the blended dataset.

China also impacts reporting. The proportion of companies reporting Scope 1 and 2 emissions is high in both regions, and the share is equal across EM and DM if China is removed. Meanwhile, around three quarters of DM countries are reporting Scope 3, compared to just under 40% in EM — again, ex-China the gap closes significantly. However, across all regions, most of these reported figures are not considered accurate or reliable enough to be included in MSCI's combined reported/estimated data set. For example, a key trend is that companies are only reporting one headline number for Scope 3 as opposed to the full breakdown across material categories.

Last, whether China is included or not, one other important point to consider in **Exhibit 2** is the absolute emissions of companies in EM vs. DM. Looking at Scope 1 and 2, absolute emissions across the portfolio companies (unweighted) are notably larger in EM. However, looking at Scope 3, absolute emissions are higher in DM. There are dynamics at play here such as DM countries offshoring their emissions to EM countries, and the basket of countries at differing points in the industrial cycle. Furthermore, on a per capita basis, the differences are also narrower (and outside the scope of this paper), but notable when looking at decarbonisation of sovereign bond portfolios.

Impacts of financial reporting

Next, let's look at how financial metrics play a role in carbon budgets. **Exhibit 3** highlights the differences between DM and EM in terms of traditional financial metrics used in carbon footprinting. Average company revenue and EVIC is almost double in DM, which inflates intensity-based carbon data points such as

weighted average carbon intensity (WACI) or economic emissions intensity using EVIC[2]. Consequently, achieving a standard level of decarbonisation (e.g., 30% or 50% vs. the parent benchmark) will in practice require a larger reduction in absolute terms within EM.

EXHIBIT 3: READ THE BALANCE SHEET

Comparing Market Cap, Revenue, and EVIC in MSCI World Index vs. MSCI EM Index (in US$ billions)

Financial metric	MSCI World Index (US$bn)	MSCI EM Index (US$bn)
Market Cap (Avg.)	$59.3	$19.9
Revenue (Avg.)	$25.6	$15.4
EVIC (Avg.)	$74.3	$40.9

Source: MSCI. Data as of November 30, 2024.

Furthermore, the above data points are generally taken in U.S. dollars, which also leads to more pronounced exchange rate effects for EM[3]. Actual carbon reduction compared to FX effects are an important element to pay attention to when attributing changes in carbon metrics. For example, what initially may look like a year-on-year reduction in WACI could in fact be almost entirely attributed to an increase in revenue — which in itself could partly be due to FX movements between local currencies and USD/EUR, with potentially no actual carbon reductions occurring in the real world.

Case study: Indian cement company

To best illustrate the impact FX rates have on emissions data, we present a case study in **Exhibit 4**, which highlights how these issues impacted a large Indian cement company over a 5-year period.

EXHIBIT 4: FX IMPACTS ON REAL EMISSIONS

Comparing carbon metrics based on FX rates (2018–2022)

Carbon Metric (Scope 1 & 2)	2018	2019	2020	2021	2022
Intensity (revenue, USD)	9,077	8,694	8,433	8,599	7,974
Change y-o-y		*-4%*	*-3%*	*+2%*	*-7%*
Intensity (revenue, INR)	145.5	124.4	119.0	115.8	107.0
Change y-o-y		*-15%*	*-4%*	*-3%*	*-8%*
Absolute Emissions	14.3m	15.6m	15.3m	15.7m	16.1m
Revenue (USD)	1525m	1797m	1816m	1827m	2015m
Revenue (INR)	98,331m	125,547m	128,684m	135,598m	150,096m
FX Rate (USD/INR)	0.015512	0.014316	0.014109	0.013474	0.013423

Source: S&P. Data as of November 30, 2024.

Looking at the data, absolute Scope 1 and 2 emissions increased by approximately 12% over the period, while revenue intensity dropped by 12%. Thus, using intensity to measure carbon footprint masks the fact that emissions have actually increased in the real world. In this case, the INR also weakened against USD over the period; therefore, the FX rate is acting as a mitigating factor in the sense of reducing the company's revenue when converting to USD. Had the FX rate remained stable (i.e., using the 2018 rate in 2022), the intensity would be approximately 6,916 — 13% lower than the actual number, and 24% lower than the 2018 figure. These dynamics are further illustrated by observing the different year-on-year trends when calculating carbon intensity in local currency and USD (for example in 2021, these moved in opposite

[2] Looking back at exhibit 2, intensity-based metrics are larger in EM for all Scopes, driven partly by the lower financial metrics.
[3] Most EM Countries are using local currencies, DM typically uses USD or EUR.

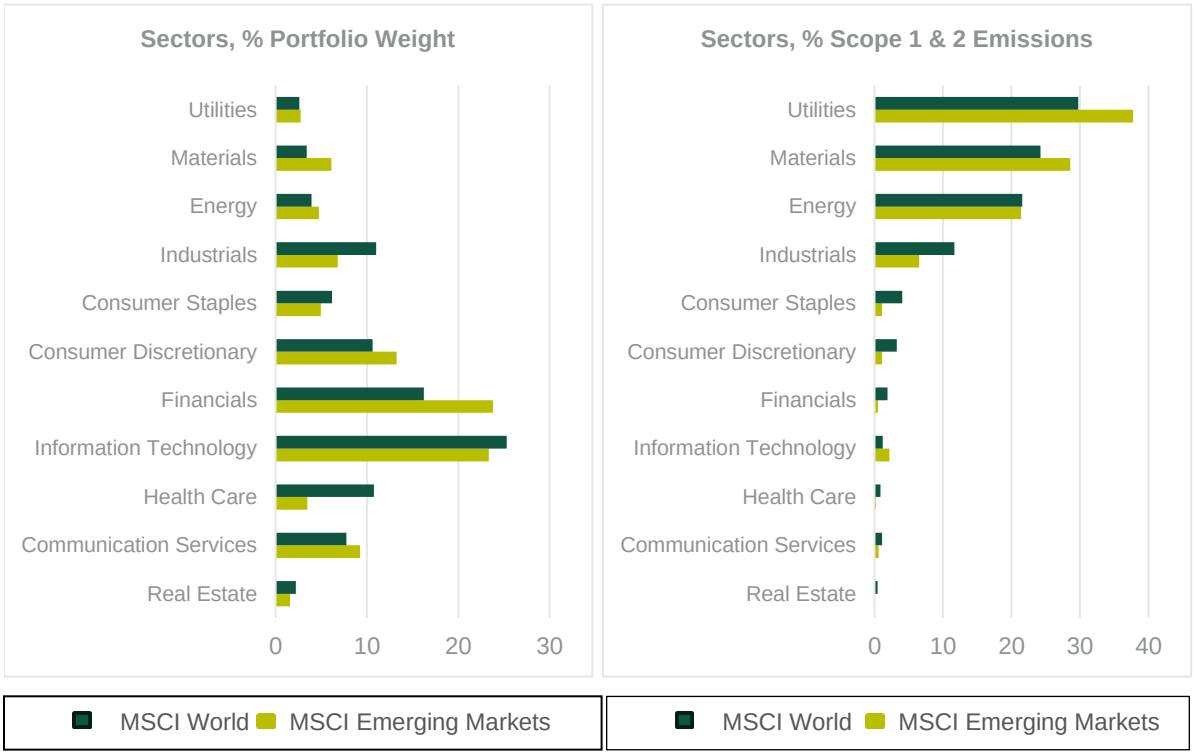
directions). Given that every country in EM uses a different currency, and most carbon footprinting requires converting these currencies to USD, the FX rate starts driving a significant portion of the change.

Sector weighting plays a role

Next, to further understand the difference between Scope 1 and 2 versus Scope 3 emissions in DM vs. EM, it is worth looking at the sectoral distributions of the parent indices. In terms of weights, shown in **Exhibit 5**, the results are perhaps closer than expected — EM have a larger share of companies in the Materials, Consumer Discretionary and Financials sectors. From a carbon perspective, Materials and Utilities represent a notably higher share of total emissions in EM, while Industrials is a bigger chunk of DM. Utilities can be explained by the difference in energy mix — whilst some EM countries (e.g., Brazil) are largely powered by renewables, others still have a very high proportion of coal generation in the grid (e.g., India). Meanwhile, for materials there are lots of industrial subindustries (e.g. cement, mining, forestry) where DM countries are partly offshoring production to EM countries.

EXHIBIT 5: INDUSTRY DISTRIBUTION, WORLD VS. EM

Sector weighting of MSCI World Index vs. MSCI EM Index and corresponding percentage of Scope 1 & 2 emissions



Source: MSCI. As of November 30, 2024.

The role of climate targets

Turning to other relevant metrics to consider for decarbonization, shown in **Exhibit 6**, almost half of the companies in the DM universe have established decarbonisation targets approved by the Science-Based Targets Initiative (SBTi), compared to around 10% for EM. That said, we are seeing improvements in EM reporting. Within both regions, the share of companies with a long-term target (beyond 2030) is much smaller. Ultimately the SBTi is a DM initiative and the target-setting process is capital intensive for

companies. While SBTi has acknowledged these systemic challenges and launched Country Activation and Incubator Projects to address them, adoption still lags in EM. Similarly, the proportion of companies reporting carbon data via the CDP questionnaire is almost double for DM. In our view, a better metric to use for EM is data provider derived measures of transition risk, such as the Low Carbon Transition Score (LCT). While LCT relies on company reporting, it is a consistent way to assess carbon risk across different countries and can be a helpful forward-looking measure as EM reporting improves when used alongside carbon footprinting metrics[4].

Furthermore, targets are point-in-time assessments of a company's climate ambitions. They tend to be derived from common scenarios assuming Net Zero 2050, and make no assessment of how, or if, a company will actually achieve the goal. Within EM, it is worth considering the fact that many countries have set their own decarbonisation goals beyond 2050 to account for 'Just Transition' factors such as growing populations, social sustainability and responsibility for historical emissions. For example, China and Saudi Arabia have 2060 Net Zero targets, while India is looking to 2070. As such, we believe metrics like LCT provide a better assessment of a company's level of ambition, particularly within EM.

EXHIBIT 6: OTHER USEFUL CARBON METRICS

Comparing commonly used carbon-related metrics across MSCI World Index vs. MSCI EM Index

Carbon Metric	MSCI World Index	MSCI EM Index
SBTi Target (no. companies)	42%	10%
SBTi Target (long term)	12%	2%
CDP Disclosure (no. companies)	81%	41%
Low Carbon Transition Score	6.1	5.6
Low Carbon Transition Management	6.0	4.5

Source: MSCI. Data as of November 30, 2024.

How we are approaching these challenges

At NTAM, we are exploring a range of solutions to help mitigate some of these complexities. For example, focusing decarbonisation and glidepaths on pure emissions metrics (e.g., financed emissions) rather than currency-based intensities to mitigate the risk of misattributing emissions intensity reduction. This helps establish consistency across DM and EM allocations; reduce the impact of lower market cap/EVIC measures in EM; and connect emissions reduction efforts to real world outcomes. If using revenue or EVIC-based intensity, this should be adjusted for inflation and FX effects to isolate the impact of decarbonisation efforts. At the very least, these financial metrics should be monitored alongside the intensity figure in order to correctly attribute changes.

Additionally, a glidepath can be implemented across a total equity allocation, which helps to mitigate trends like DM countries offshoring emissions to EM, as well as fundamentally arbitrary decisions about which countries are considered EM or DM

[4] See here an NTAM study on how achieving portfolio uplifts for the LCT and similar metrics impacts total risk and factor exposure.

Lastly, within EM portfolio construction (e.g., for tilting purposes), we believe consistent forward-looking measures of transition risk management can be easily compared to DM. Further, in our view, these forward-looking measures are better signals of a company's climate ambitions compared to only looking at emissions, emissions intensity or binary measures of a company's target-setting activities.

Conclusion

In conclusion, we have presented a number of data-related areas to look out for when implementing decarbonisation pathways in Emerging Markets. At a portfolio level, there are fundamental differences between DM countries and EM countries reflected in carbon emissions. There are also a number of considerations that become increasingly important in EM, including: which metrics to use for carbon footprinting; which countries to include or exclude in the benchmark; and FX rates between a portfolio's country currencies and USD. While the above exploration gives some practical data-related considerations for decarbonisation and carbon-related risk mitigation, future papers will also investigate seeking and achieving positive impact within portfolios. This is another area where differences between EM and DM matter, particularly when it comes to how differing taxonomies are defining 'Green' and how 'Just Transition' approaches consider social factors in EM countries.

IMPORTANT INFORMATION

For Asia-Pacific (APAC) and Europe, Middle East and Africa (EMEA) markets, this information is directed to institutional, professional and wholesale clients or investors only and should not be relied upon by retail clients or investors.

The information contained herein is intended for use with current or prospective clients of Northern Trust Fund Managers Ireland Limited (NTFMIL) or its affiliates. The information is not intended for distribution or use by any person in any jurisdiction where such distribution would be contrary to local law or regulation. NTFMIL or its affiliates may have positions in and may effect transactions in the markets, contracts and related investments different than described in this information. This information is obtained from sources believed to be reliable, its accuracy and completeness are not guaranteed, and is subject to change. Information does not constitute a recommendation of any investment strategy, is not intended as investment advice and does not take into account all the circumstances of each investor.

This report is provided for informational purposes only and is not intended to be, and should not be construed as, an offer, solicitation or recommendation with respect to any transaction and should not be treated as legal advice, investment advice or tax advice. Recipients should not rely upon this information as a substitute for obtaining specific legal or tax advice from their own professional legal or tax advisors. References to specific securities and their issuers are for illustrative purposes only and are not intended and should not be interpreted as recommendations to purchase or sell such securities. Indices and trademarks are the property of their respective owners. Information is subject to change based on market or other conditions.

The information in this proposal reflects prevailing market conditions and our judgment as of this date, which are subject to change without notice. **Past performance is no guarantee of future results**. All material has been obtained from sources believed to be reliable, but the accuracy, completeness and interpretation cannot be guaranteed. The information does not constitute investment advice or a recommendation to buy or sell any security and is subject to change without notice.

Simulated and actual past performance is not a reliable indicator of future results and should not be the sole factor of consideration when selecting an investment product or strategy. Forward-looking statements and assumptions are (NTFMIL) or its affiliates' current estimates or expectations of future events or future results based upon proprietary research and should not be construed as an estimate or promise of results that a portfolio may achieve. Actual results could differ materially from the results indicated by this information.

Northern Trust Asset Management (NTAM) is composed of Northern Trust Investments, Inc. (NTI), Northern Trust Global Investments Limited (NTGIL), Northern Trust Fund Managers (Ireland) Limited (NTFMIL), Northern Trust Global Investments Japan, K.K. (NTKK), NT Global Advisors, Inc., 50 South Capital Advisors, LLC, Northern Trust Asset Management Australia Pty Ltd and investment personnel of The Northern Trust Company of Hong Kong Limited (TNTCHK) and The Northern Trust Company (TNTC).

Issued in the United Kingdom by Northern Trust Global Investments Limited, issued in the European Economic Association ("EEA") by Northern Trust Fund Managers (Ireland) Limited, issued in Australia by Northern Trust Asset Management (Australia) Limited (ACN 648 476 019) which holds an Australian Financial Services Licence (License Number: 529895) and is regulated by the Australian Securities and Investments Commission (ASIC), and issued in Hong Kong by The Northern Trust Company of Hong Kong Limited which is regulated by the Hong Kong Securities and Futures Commission.

Environmental, Social and Governance (ESG) investing involves certain risks because the methodology of an underlying index selects and assigns weights to securities of issuers for nonfinancial reasons, a strategy may underperform the broader equity market or other strategies that do not utilize ESG criteria when selecting investments. The companies selected by an index provider as demonstrating ESG characteristics may not be the same companies selected by other index providers that use similar ESG screens. In addition, companies selected by an index provider may not exhibit positive or favorable ESG characteristics. Regulatory changes or interpretations regarding the definitions and/or use of ESG criteria could have a material adverse effect on a strategy's ability to invest in accordance with its investment policies and/or achieve its investment objective. show less

I-040725-4384078-040726