

FIXED INCOME

Measuring a Country's Carbon Emissions: A Debate with High Stakes

BARINGS INSIGHTS

Why some metrics are more accurate, more equitable, and more efficient than others.

As the effects of climate change become increasingly apparent—from rising sea levels to more frequent and devastating natural disasters, the need for action becomes more urgent by the day. Environmental responsibility has permeated to all sectors of the financial industry. In particular, asset managers have seen increasing interest from clients, regulators and the general public to facilitate this effort by directing financial flows toward entities that make better environmental citizens.



Kawtar Ed-Dahmani

Managing Director, Emerging Markets Sovereign Debt

In order to encourage environmentally-friendly investments, we believe there needs to be some type of consensus of the **appropriate measure of carbon intensity** at both the individual investment and portfolio levels. But as of today, there is no such consensus. This is apparent in emerging markets debt, for instance, where the standards and metrics to track the carbon intensity for sovereign bonds are still being debated.

It is, however, possible to track this data for sovereign debt at both the asset and portfolio levels. Indeed, governments are able to control not only the emissions by the public sector but also influence those of the private sector, including firms and households. In our opinion, the unit of reference should therefore be the country as a whole, but much debate remains around the appropriate way to measure and track carbon intensity. Specifically, should the unit of intensity be per GDP? Or per capita? A lack of consensus today on this matter is resulting in confusing comparisons from country to country—and odd incentive structures for the countries tackling climate changes.

These are not just theoretical debates or topics for the experts. Asset owners and regulators are increasingly imposing specific metrics and limits of portfolio carbon intensity on asset managers, who are then investing money in different countries subject to those limits and constraints. The choice of the most appropriate metric to follow will have significant implications on which countries ultimately receive financial inflows to help tackle climate change—and which do not.

We believe measuring carbon intensity using consumption-based accounting, on a per capita basis, is more intuitive, fairer and more in line with international agreements than other carbon intensity measurements. Here is why.

Who should pay the price: carbon producers or carbon consumers?

There are two ways to measure carbon emissions for a country: production-based accounting, which aggregates all greenhouse gas (GHG) emissions of goods and services produced domestically in a country (including those which are subsequently exported), and consumption-based accounting, which looks at domestically produced carbon emissions in combination with the net imports of carbon emissions of goods and services. For instance, a country that produces 100 units of CO₂ emissions but only consumes 70 locally will have 100 units of emissions in production-based accounting, but only 70 (plus other potential net imports) under consumption-based accounting.

This is important as there is a debate over who is responsible for the carbon content of internationally traded goods: producers or consumers? For instance, who is ultimately responsible for the relocation of polluting economic production to poorer countries that has taken place over the past decades? The countries where the production currently takes place or the country that moved the production of carbon-intensive industries abroad while importing the resulting products? This is called “carbon leakage”, whereby carbon emissions are effectively exported as value chains—and are structured in such a way that the most polluting stages of production are set up in emerging countries rather than developed economies. Production-based accounting assumes that emerging countries should assume full responsibility for the carbon intensity of their production, while consumption-based accounting shares the environmental responsibility with the consuming countries.



Should wealthier countries have the right to pollute more?

Comparing carbon emissions for two economies of very different sizes or very different populations is not meaningful, in our view, which is why we need a good measure of carbon intensity. In other words, we need the right choice of denominator in order to derive the right unit of measurement.

Some believe that carbon intensity is more accurately measured by unit of GDP when GHG emissions are measured using production level emissions, but better measured per capita when emissions are measured using consumption level emissions.

However, even when measuring carbon emissions through production-based accounting, we believe using population as the denominator is less biased. One main reason is based on the inconsistencies in measuring GDP across countries:

- GDP is a price-dependent metric, and the same goods and services may have lower prices in emerging countries, especially non-tradables, which artificially increases their carbon intensity. This can be corrected by adjusting for purchasing power parity (PPP), but it is still not perfect.
- In general, countries measure GDP differently; it is not a clear cut, apples-to-apples comparison.
- As there is a large share of informal/shadow economic activity operating in several emerging economies, GDP is likely to be understated across these countries. In particular, frontier and poor EM countries tend to understate GDP as large services sectors are not properly accounted for, as evidenced by recent GDP revisions from Ghana, Kenya and Nigeria.

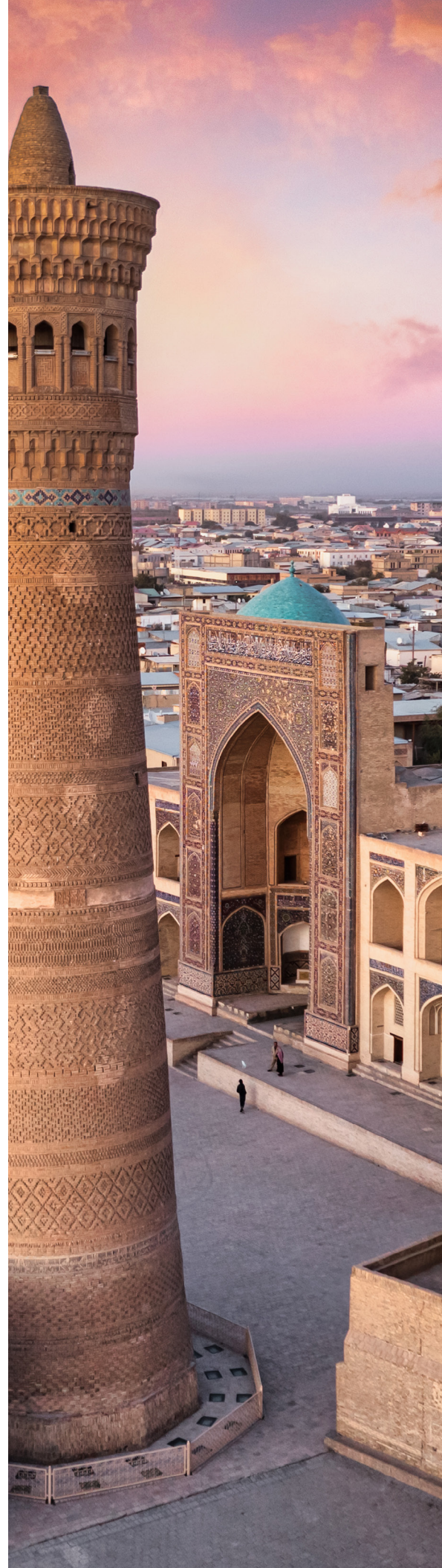
Is it more equitable to measure GHGs on a per capita basis?

Measuring carbon emissions per capita is equivalent to multiplying carbon emissions per GDP by GDP-per-capita. An immediate implication is that for two countries with the same level of carbon emitted per person, the wealthier one (with higher GDP/capita) will be more favorably rated under the carbon/GDP metric. Does a globally set standardized measure of carbon intensity aim to justify—and normalize—carbon emissions by income and wealth, and therefore divide GHGs by GDP, instead of justifying carbon emissions by people, in their own individual right, regardless of their wealth? It seems to us that the equitable choice is the measure of carbon intensity that treats all individuals, rich or poor, the same, or as one human, entitled to emit an “acceptable” amount of carbons—rather than treat individuals differently but treat only their money, income and wealth the same. To make the point more concrete, is the developed market citizen who produces and consumes fancy electronics and produces and drives expensive cars more entitled to emitting GHGs than a seaside villager who emits carbon to power her fishing boat to catch low value-add fish?

In addition, countries with high GDP tend to have a large share of high value-add sectors, which tend to create less CO₂—for example, larger financial services or technology sectors—and would dilute the pollution created by other low added value activities. This is a corollary of the concept of carbon leakage discussed earlier.

An immediate implication is that using the carbon intensity by unit of GDP as a guide to allocate financial resources may reduce the pace of emissions but not reverse it. The goal of reducing carbon emissions can be better achieved by focusing on the per-capita measure of emissions. Why? Because those countries which produce more, and emit more GHGs, should arguably bear the majority of the responsibility for lowering emissions as measured by GHG per capita. While poorer countries should aim to lower emissions as well, they should have more leeway to industrialize, grow their economies, and prosper, before they are expected to match the GHG reductions of richer countries.

“In line with the UN and Paris Agreement philosophy, we are of the normative view that each person on the planet should be entitled to a certain stock of pollution rights, regardless of their level of wealth.”



Why not simply follow the guidance of international organizations?

The letter and spirit of ESG was originally to encourage investor flows into poorer countries to help with environmental energy efficiency transition. If we consider carbon emissions per GDP, then we would be favoring developed countries (as they have a lower carbon intensity) that have had the ability to invest in less intensive carbon-emission technologies, and penalizing developing countries (which have a higher carbon emissions per GDP) that might be lagging behind in those investments, and that therefore really need those capital inflows to make those investments. In particular, developing countries would be disproportionately penalized for lack of clean energy for everyday life, such as cooking. As a result, such criteria would not only be unfair and give rich countries a larger “right to pollute”, but it would also be detrimental to fight climate change. Moreover, by providing financial resources to poorer countries, investors will make possible the transfer of more carbon-efficient technologies, which can result in a direct reduction in GHG emissions.

In line with the UN and Paris Agreement philosophy, which is to consider countries’ common but differentiated responsibilities and respective capabilities—the CBDR-RC principle—we are of the normative view that each person on the planet should be entitled to a certain stock of pollution rights, regardless of their level of wealth. It is for these reasons that industrialized countries under those agreements have committed to absolute reductions in emissions or emission caps, while developing countries do not have such obligations.

Which countries should be financially incentivized to depollute?

The choice of one carbon intensity metric over another could have far-reaching implications on directing financial flows to some countries versus others. Here are two examples that illustrate these high stakes:

- The list of the highest polluters using carbon intensity per capita includes Australia, Qatar, Kuwait, Canada and the U.S., while the list of highest polluters using carbon intensity per unit of GDP includes Uzbekistan, South Africa, Trinidad & Tobago and Ukraine. In terms of the nominal number of CO₂ emissions—which is the absolute number in tons, and not even on a per capita basis—the U.S. emits annually more than 10 times the quantity of CO₂ produced by South Africa.¹ From the list of countries above, which ones do you believe should be prioritized to receive funds from investors to tackle climate change, and which ones should be excluded from portfolios striving to be less carbon intensive?
- A country like Tajikistan, which is investing heavily in developing its massive hydropower potential, scores in the top 20 of polluters in the world on the basis of CO₂ emissions per GDP.² At the same time, it is also one of the lowest polluting countries on the basis of CO₂ emissions per capita. A strict compliance with mandate guidelines based on carbon intensity per GDP may have discouraged investors from investing in bonds that will fund a project to materially improve Tajikistan’s energy mix over the coming years.

While we have only focused on one part of the debate in this piece, there are other points that are worthy of analysis, too. For instance, all the metrics mentioned above only take into account gross carbon emissions and not net emissions. An immediate implication is that some countries who have invested heavily over the past decades in protecting their rainforest, such as Brazil or Gabon, are not rewarded for that, while their efforts benefit not only their own population but also global climatic balances. In our view, there needs to be more debate on the choice of metrics as this will undoubtedly have significant implications in financing green efforts in the years to come.

1,2: Source: European Commission.

Barings is a \$382+ billion global investment manager sourcing differentiated opportunities and building long-term portfolios across public and private fixed income, real estate and specialist equity markets. With investment professionals based in North America, Europe and Asia Pacific, the firm, a subsidiary of MassMutual, aims to serve its clients, communities and employees, and is committed to sustainable practices and responsible investment.*

REFERENCES:

- Accounting for Carbon: Sovereign Bonds, Gautier Desme & Lauren Smart, S&P. June 2018.
- Consumption-based accounting of CO2 emissions, Steven J. Davis, Ken Caldeira, Proceedings of the National Academy of Sciences. March 2010.
- EDGAR (Emissions Database for Global Atmospheric Research) v6.0—<https://data.jrc.ec.europa.eu/collection/edgar>.

IMPORTANT INFORMATION

Any forecasts in this document are based upon Barings opinion of the market at the date of preparation and are subject to change without notice, dependent upon many factors. Any prediction, projection or forecast is not necessarily indicative of the future or likely performance. Investment involves risk. The value of any investments and any income generated may go down as well as up and is not guaranteed by Barings or any other person. **PAST PERFORMANCE IS NOT NECESSARILY INDICATIVE OF FUTURE RESULTS.** Any investment results, portfolio compositions and or examples set forth in this document are provided for illustrative purposes only and are not indicative of any future investment results, future portfolio composition or investments. The composition, size of, and risks associated with an investment may differ substantially from any examples set forth in this document. No representation is made that an investment will be profitable or will not incur losses. Where appropriate, changes in the currency exchange rates may affect the value of investments. Prospective investors should read the offering documents, if applicable, for the details and specific risk factors of any Fund/Strategy discussed in this document.

Barings is the brand name for the worldwide asset management and associated businesses of Barings LLC and its global affiliates. Barings Securities LLC, Barings (U.K.) Limited, Barings Global Advisers Limited, Barings Australia Pty Ltd, Barings Japan Limited, Baring Asset Management Limited, Baring International Investment Limited, Baring Fund Managers Limited, Baring International Fund Managers (Ireland) Limited, Baring Asset Management (Asia) Limited, Baring SICE (Taiwan) Limited, Baring Asset Management Switzerland Sarl, and Baring Asset Management Korea Limited each are affiliated financial service companies owned by Barings LLC (each, individually, an "Affiliate"). Some Affiliates may act as an introducer or distributor of the products and services of some others and may be paid a fee for doing so.

NO OFFER: The document is for informational purposes only and is not an offer or solicitation for the purchase or sale of any financial instrument or service in any jurisdiction. The material herein was prepared without any consideration of the investment objectives, financial situation or particular needs of anyone who may receive it. This document is not, and must not be treated as, investment advice, an investment recommendation, investment research, or a recommendation about the suitability or appropriateness of any security, commodity, investment, or particular investment strategy, and must not be construed as a projection or prediction.

Unless otherwise mentioned, the views contained in this document are those of Barings. These views are made in good faith in relation to the facts known at the time of preparation and are subject to change without notice. Individual portfolio management teams may hold different views than the views expressed herein and may make different investment decisions for different clients. Parts of this document may be based on information received from sources we believe to be reliable. Although every effort is taken to ensure that the information contained in this document is accurate, Barings makes no representation or warranty, express or implied, regarding the accuracy, completeness or adequacy of the information.

Any service, security, investment or product outlined in this document may not be suitable for a prospective investor or available in their jurisdiction.

Copyright and Trademark

Copyright © 2021 Barings. Information in this document may be used for your own personal use, but may not be altered, reproduced or distributed without Barings' consent.

The BARINGS name and logo design are trademarks of Barings and are registered in U.S. Patent and Trademark Office and in other countries around the world. All rights are reserved.

LEARN MORE AT [BARINGS.COM](https://www.barings.com)

**As of June 30, 2021*

21-1853845