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Can Sovereign ESG Help Guide Nation-States' Transformative Change?

Rebeca Sánchez Enríquez[1], Ellen Hillbom[1] & Andrés Palacio[1,2]

[1] Department of Economic History, Lund University, Lund, Sweden

[2] Universidad Externado de Colombia, Bogotá, Colombia

Correspondence: Ellen Hillbom, Department of Economic History, Lund University, Box 7080, 22007 Lund, Sweden. Tel: 46-46-2227486. E-mail: ellen.hillbom@ekh.lu.se

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Abstract

This study examines the role of the Sovereign ESG framework in assessing national progress toward Transformative Change (TC) via environmental, social, and governance metrics. Using data from the World Bank Sovereign ESG Data Portal, we conduct an empirical explorative quantitative study and analyze ESG development across country income groups to identify sustainability challenges and opportunities. The research addresses ESG development status, barriers to progress, and the framework's potential to support TC-focused policies. We find a relationship between income levels and the implementation of sustainable policies and promoting equitable development, that higher-income countries are often the largest consumers and polluters, and that lower-income countries face considerable challenges related to food security, basic service provision, and social inequality. Further, governance indicators tend to improve as income levels rise, and hence, the progress toward sustainability shows substantial variation based on a country's development stage. We argue that the Portal provides valuable takeaways in terms of its contribution to identifying priority areas and facilitating cross–country comparisons and in the way it provides arguments for promoting international collaboration, strengthening institutional capacity, and contextualizing global standards. While better data is highly desirable, we conclude that the Sovereign ESG concept paired with the Portal metrics can be a valuable framework for nation-states when tracking sustainability progress. We end with a few policy-related suggestions related to environmental sustainability, global solidarity, contextualization, affordable clean energy, and future research.

Keywords: sovereign ESG, transformative change, agenda 2030

1. Introduction

The Economic, Social and Governance (ESG) concept with a set of relevant metrics was presented to support the private sector's efforts to meet its social responsibility agenda for green growth and sustainable development (Yang et al., 2024). In the call from "Billions for Trillions" in 2015, the United Nations and the multilateral development banks (MDBs) pushed for the sector to finance this transition to meet Agenda 2030 and the Sustainable Development Goals (SDG). Nevertheless, the ambitions have continuously demanded governments to identify and adapt or mitigate climate-related sovereign risks to facilitate the private sector's and MDBs' endeavors (Mawdsley, 2018; Cummine, 2023, p. 14). Meanwhile, nation-states constitute critical actors in providing data and information, implementing public policies, taking risks, and making investments to engineer and drive Transformative Change (TC) (Chaminade et al., 2024), i.e. the transition toward a sustainable society regarding economic, social, and environmental considerations (Islam & Iversen, 2018; Utting, 2018; Volz et al., 2020, p. 116).

In a fusion of private and public sustainability initiatives, the World Bank launched the Sovereign ESG concept in 2019. While sharing pillars with the original Corporate ESG, it was intended as a framework for researchers and policymakers to analyze and assess the interplay of environment, society, and governance in nation-states' move towards TC (Gratcheva et al., 2021a; Morgenstern et al., 2022). The concept was later complemented with the adjacent World Bank Sovereign ESG Data Portal (henceforth the Portal), which contains a set of indicators facilitating a country-level comparison revealing nation-states' TC status and the trade-offs between the concept's dimensions.

In this study, our overarching research interest is to understand how Sovereign ESG and the Portal can support

nation-states in identifying priorities to achieve holistic and inclusive sustainable development and guide them in developing policies that will most effectively result in TC. Our contribution lies in conducting an empirical exploratory quantitative study where we interrogate the quality and applicability of the Portal as a tool to contextualize different sustainability pathways through cross-country and time comparisons. We scrutinize the availability and quality of data, divide countries into income clusters, and create a global average per group. By comparing income clusters and contrasting country experiences to the average, we investigate what the Portal can tell us about the past and the current situation. A link between the ESG pillars and the SDGs serves as our framework for discussing the results. Our research questions are: What is the status regarding environmental, social, and governance development for different clusters of countries measured by the same development standards, and for individual countries? What aspects block progress in the sustainability dimensions? How can the Sovereign ESG concept and the Portal support nation-states' progress towards TC?

Our study provides several findings. We confirm that as income levels rise, the governance indicators may improve, facilitating the implementation of sustainable policies and promoting equitable development. For environmental development, high-income countries are often the largest consumers and polluters, while lower-income countries struggle with managing natural resources sustainably due to dependence on fossil fuels and subsistence farming. In social terms, lower-income countries face considerable challenges related to food security, basic service provision, and social inequality, although our results are exacerbated by limited data availability for accurate assessments. Governance indicators, such as political stability and corruption control, tend to improve as income levels rise, which in turn facilitates the implementation of sustainability policies. Progress toward sustainability, therefore, shows substantial variation based on a country's development stage, with high-income countries generally better positioned, upper-middle-income countries making progress, and lower-income countries facing significant hurdles. Yet, contributions from emerging economies like China and India show that advancements in innovation, particularly in R&D and scientific output, support sustainable development by driving technological solutions for global challenges.

These results confirm the state of the world to be in line with expectations, as are the continued concerns about countries' uneven statistical capacity. We also ascertain that when the existing metrics are discussed in relation to the ESG-SDGs framework, the Portal provides valuable takeaways. Both its contribution to identifying priority areas and facilitating cross–country comparisons, and in providing arguments for promoting international collaboration, strengthening institutional capacity, and contextualizing global standards. Overall, we find that the Sovereign ESG concept and metrics together enable a structured approach with the potential to support nation-states in making tailored progress toward TC while also fostering an understanding of their unique challenges and capacities.

Our text is organized into four more sections. Next, we account for our data from the Portal and methods for the study. Section 3 presents our results in three sub-sections according to the environmental, social, and governance pillars. Section 4 discusses our results and the Sovereign ESG framework in relation to TC. The final section concludes with remarks on the main findings and suggestions for the way forward.

2. The Study

2.1 Sovereign ESG Data

The Portal contains data for 211 economies covering 62 years, which is structured according to the three ESG pillars divided into 17 dimensions. It reportedly provides 135 indicators, but when we worked on the data, only 72 indicators were available in the downloadable Excel file (World Bank, 2024). While relying on one source (only) entails potentially having a selection bias, to the best of our knowledge, it is the most complete and suitable dataset for the exploratory purposes of our study. The Portal groups countries into clusters according to the World Bank's national income level classification: high-income countries (HIC), upper-middle-income countries (UMIC), lower-middle-income countries (LMIC), and low-income countries (LIC) (see Appendix A for a detailed list). Data availability, including indicator availability, is higher for the more affluent than for the poorer countries. While grouping countries based on income as a development indicator constitutes an oversimplification, ingrained income bias (IIB) shows that a country's income level explains about 90% of Sovereign ESG scores (Gratcheva et al., 2021a, pp. 10, 13; Khoury et al., 2022).

We retain the original income-based grouping for comparability and set up two additional data selection criteria to improve homogeneity among indicators per cluster. The latter was particularly relevant as we, for our analysis, calculated a global average (GA) for each indicator and per cluster, which we use to make within-cluster cross-country comparisons as well as between-cluster comparisons. First, to ensure a general inclusion criterion for the data per cluster and pillar, we excluded an indicator if it was unavailable for at least 75% of countries in a cluster.

Because it is an average built upon the individual country's means per country, the GA is highly sensitive to data availability. Hence, the inclusion of indicators where most countries, or less than half of individual country values, are not available would greatly bias the GA and not give a representative view of the indicator for the specific cluster. We combine the first criterion with a second one whereby we exclude years on indicators when the individual values throughout the time series for multiple countries have more than 30% data gaps due to blank values. This further reduces the risk of bias in the calculation of individual countries' means and the GA.

After our selection, the working data set covers 45 of the 72 indicators downloadable in the Portal (see Appendix B for a detailed list). Despite the reduction of indicators in the working dataset, we can examine time frames of decades and monitor development changes for the environmental pillar since the 1990s, the social pillar since 2000, and the governance pillar since 2002. Table 1 accounts for the number of indicators per pillar and dimension in our data set. The most important data omissions are the absence of indicators for climate risk and resilience, and poverty and inequality. For the former, only two indicators are available (cooling degree days and population density), which are hard to homogenize. The latter's indicators did not fulfil our availability criteria mentioned above.

Table 1. World Bank Sovereign ESG Data Portal – pillars, dimensions, and indicators

Pillars	**Dimensions**	**Nr of indicators: downloadable/included**
Environment	Emission & pollution	6/4
	Energy use & security	7/7
	Climate risk & resilience	9/0
	Food security	3/3
	Natural capital endowment & management	7/3
Social	Access to services	4/4
	Demography	3/3
	Education & skills	3/2
	Employment	3/2
	Health & nutrition	5/4
	Poverty & inequality	4/0
Governance	Economic environment	2/1
	Gender	4/3
	Government effectiveness	2/2
	Human rights	3/1
	Innovation	3/3
	Stability & rule of law	4/3

Source: World Bank, 2024.

2.2 Approach to TC and Treatment of Data

Our analysis uses the TC concept alongside cross-country comparisons to interpret the data. TC is a relatively novel concept that shares parts of its foundation with the classical notion of structural change, argued for by economists such as Arthur Lewis and Simon Kuznets and focusing on changes in the composition of value added and employment over time, leading to sustained economic growth rates. In the structural change paradigm, transformation is characterized by a sectoral change in a single closed economy whereby the dominance of the agricultural sector gives way to manufacturing and industry, and eventually leads to a services-oriented economy. However, TC takes structural change further by recognizing the necessity of achieving social goals and ensuring that the transformation occurs within our planetary boundaries and incorporates all three dimensions of sustainability – economic, social, and environmental (Barbieri et al., 2021; Feola, 2015; Islam & Iversen, 2018).

Some research emphasizes the importance of context analysis including society's specific values, aspirations, and

beliefs' support for understanding transformations (Weitz et al., 2015). Here, the added dimensions of governance and culture are critical for TC as they can explain why societies with similar initial conditions may end up in different development trajectories, for example, when addressing issues such as the poverty-environment nexus (Awad & Warsame, 2022). Also, societies with high inequality are generally more resistant to TC, although some argue that universal education can potentially alter existing cultural choices and path dependencies, impeding sustainable development (Siegel & Lima, 2020; McElwee et al., 2020). Meanwhile, robust political systems are essential, as institutions and history may provide or curtail incentives for sustainable development (Kuenkel, 2019). New governance rules and social regimes must be established to break the current path dependencies that tie countries to negative dynamics (Ghosh et al., 2021). This becomes even more crucial as complexity increases with TC and the list of stakeholders changes and creates conflicting interests when addressing common concerns related to governance (Deacon, 2016; Kuenkel, 2019, p. 145).

Reliable data-driven metrics are necessary for nation-states to track trends and set development goals in line with TC (Gupta et al., 2020). It is especially crucial for fragile states as progress is unfeasible without appropriate and trustable measures, and it may explain the reasons for their timing in taking action (D'Alessandro & Besada, 2019, p. 382; Shimada, 2014, p. 59). While the Portal constitutes an impressive data-compiling effort, the scarcity of sustainability-related data is problematic at all income levels, which poses a clear impediment to studying TC. The data omission for all pillars is particularly severe for LICs and island states. Poor statistical capacity is a recognized development challenge for these countries, making relevant research and policy recommendations difficult (Hillbom et al., 2023). In the present study, island states have the smallest number of indicators.

Our data treatment consists of three steps. First, we calculate the individual country mean per indicator and compare it to a calculated income group GA to learn individual countries' performance relative to their income peers. This provides insights into dynamics per pillar at the group level and per individual country regarding their performance in ESG indicators. The calculated GA is sensitive to outliers, and when countries have unexpected individual country means, below or above GA values, we analyze them separately. We summarize the results in heatmap tables, which we provide links to in Appendix C.

Second, we use the results reflected in the heatmaps to rank nation-states according to how their individual indicator country means are positioned relative to their peers in the specific income cluster and respective pillar. Our approach has previously been used, for example, in an exploratory study by Becker (2012), and allows us to summarize big sets of information and conduct further statistical methods. In the rankings, 1 is always the best performer and the peers are ranked in ascending order from top to bottom performer. We also consider the indicator's direction (positive or negative) when executing the rankings.[1] To strengthen the methodology and results, we create a final ranking for each country based on an aggregated final score of the rankings per indicator. While we recognize the tradeoffs involved and that mechanical indices can never fully reflect all complexities and varying dynamics between variables that might be correlated, our rationale is to keep the summary indicator as simple and transparent as possible.

Third, we use the final ranking as the dependent variable and run some regressions. They support the heatmap results but add more robustness and further insights into the TC dynamics. Generally, the regression negative coefficients indicate a "positive tendency", showing that the country is reducing its ranking number and getting closer to the number one performer. Meanwhile, positive coefficients indicate a "negative tendency" as an increasing value indicates that the country is moving towards the bottom performer. In the results sections, all indicators in the regression models are significant at the model level (F test indicating overall significance). The indicators discussed individually throughout the text in terms of significance are at the individual level (t-test). All regressions are found through links in Appendix D.

2.3 Linking ESG and SDG

Figure 1 illustrates the relationship between the SDGs and the three pillars of Sovereign ESG, framing the latter concept as a tool for making more informed sustainability decisions (Semet, 2020) (Appendix E presents the SDGs). The environmental (E) pillar expands on the role of natural resources and institutional frameworks as critical factors in determining structural change and development trajectories (Engerman & Sokoloff, 2002),

[1] An example of an inverse or negative relationship is if we rank the LIC sample according to CO2 emissions in metric tons per capita and consider the country with the largest amount as being the most CO2 pollutants and impacting most negatively the environment, making it a bottom performer. The country with the biggest emissions is given a ranking of 28 (Democratic Republic of Korea) and the country with the least emissions is the top performer given a ranking of 1 (Central African Republic). In the case of a linear or positive relationship in the LIC sample according to School enrollment at the primary level (% gross), we consider the country with the highest number as the best performer, ranking 1 (Malawi) and the country with the lowest number as the worst performer, ranking of 28 (Somalia).

specifically by assessing how resilient natural capital and institutions relate to climate change (Semet et al., 2021). The social (S) pillar addresses goals such as reducing poverty and inequality, human rights, gender equality, demographics, and citizens' access to basic needs for a decent life (Boitreaud et al., 2020, p. 43). The governance (G) pillar focuses on institutional capacity and the influence of governance as a driver of development (Acemoglu, 2010; Engerman & Sokoloff, 2002). Acemoglu argues that variations in the quantity and efficiency of human and physical capital and technology stem from the institutional context. Governance, therefore, has a cross-cutting impact across all dimensions and is crucial for development pathways (Burnside & Dollar, 2000; Semet et al., 2021). Other dimensions, such as culture, are reflected in social standards through indicators within the S and G pillars (Semet et al., 2021).

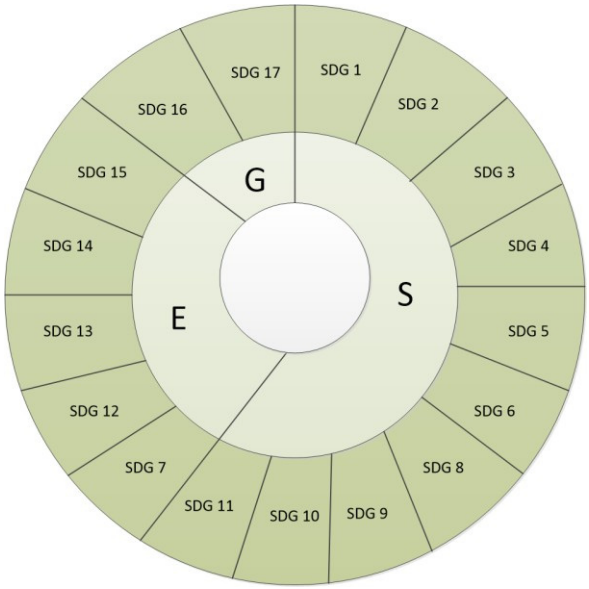

Figure 1. Sovereign ESG pillars' relation with SDGs

Source: Authors' elaboration based on Semet (2020).

Most existing studies are related to the E and G pillars, although more S pillar studies have recently emerged (Semet, 2020; Semet et al., 2021). Comprehensive agreement exists for scores for the S and G pillars, and there are apparent differences between countries according to income levels. Regarding the E pillar, there are additional difficulties because of the lack of clarity around it (Gratcheva et al., 2021a, p. 10, 2021, pp. 17, 49), which could be due to disagreements regarding standards for environmental performance and the obscure data landscape. As in TC, capturing the environmental dimension is one of the biggest challenges. Investment efforts to support TC tend to concentrate on HICs, exposing LICs to climate change and other climate-related events. Previous literature on Sovereign ESG has noted the ingrained income bias by developmental status, meaning that HICs tend to have higher Sovereign ESG rankings than other countries (Jiang et al., 2022).

The advocates of Sovereign ESG argue that if governments apply the framework's standards to integrate Agenda 2030 with comparable results, we can improve our understanding of the context, or the conditions, for successful TC at the level of the nation-state (Semet, 2020; Zhang et al., 2022). However, others criticize Sovereign ESG for not providing a deeper understanding of its dimensions and their applicability to real contexts through empirical analysis (Gratcheva et al., 2021a; Zhang et al., 2022). The cautions are warranted considering the existing fragmentation in data definitions and overall data omissions, particularly for countries in the Global South (Hillbom et al., 2023). These data challenges obstruct global progress toward the universal goals imposed by the sustainability agenda and the ability to track its progress. It was against this background the World Bank launched its Sovereign ESG Data Portal in 2023 and updated it in 2024. With the Portal consolidating nation-states' data addressing the Sovereign ESG framework's pillars, dimensions, and indicators, it ideally provides a factual base for governments to build their TC policies.

3. Results

This section addresses our first research question and presents results on the performance of income clusters and individual countries relative to one another and the GAs. The structure follows the three pillars of Sovereign ESG and the dimensions presented in Table 1. We use the indicators underlined in Appendix B and refer to the results

in our heatmaps in Appendix C and insights from our regressions in Appendix E. For all three pillars, the results of the regressions are consistent with the comparisons based on the heatmaps, and the slope coefficients for the indicators are consistent with the expected relationships of the indicators.

3.1 The Environment Pillar

Emission and pollution: LICs have the lowest emissions per capita across CO2, methane, and nitrous oxide. LMICs show emission values that are two to three times higher than those in LICs across all variables. In UMICs, emissions continue to rise, with a trend toward convergence within the group as the variation in mean emissions relative to the GA decreases. Russia stands out as an outlier in the convergence trend. Finally, HICs have the highest emission levels, and the cluster includes top polluters such as the United States, Germany, the Netherlands, and Finland, who exceed their GA emissions per capita for all gases. Across income clusters, countries with emissions above their respective GA are typically large oil exporters or economies heavily reliant on fossil fuels (Ritchie et al., 2020).

An added insight from the regressions is that the indicators for Nitrous oxide and Methane emissions relationship signs change from negative (LIC and LMIC) to positive (UMIC and HIC). This could be due to more data accuracy with higher income since the expected relationship between the indicators and the ranking should be a positive sign.

Energy use and security: The findings in this dimension can largely be attributed to the outsourcing of production to LICs (Wang et al., 2019). Data indicate that HICs are net energy exporters, with -125 GA. However, this result is somewhat misleading due to the inclusion of non-industrialized major oil exporters such as the United Arab Emirates, Saudi Arabia, Qatar, and Kuwait. Most HICs are net energy importers when these countries are excluded, showing positive values relative to the GA.

UMICs generally remain energy exporters with rising emissions, although some countries, such as Albania, Bulgaria, and Costa Rica, stand out as net energy importers. There is a trend toward convergence within the group. LMICs are also net energy exporters, a trend highlighting the natural resource-driven nature of many LMIC economies and the spillover effects of high energy exports are visible in poorer performance on related environmental indicators. For example, Algeria, Angola, Congo, and Bolivia have some of the highest levels of energy export (such as oil, gas, and coal) among LMICs and increased environmental damage.

When examining energy use indicators for energy intensity and renewable resource utilization, LICs generally perform well. For instance, 14 out of 28 LICs exceed their GA of 71.8% in renewable energy consumption as a proportion of total energy use. Conversely, despite their advanced level of development and financial capability to invest in clean energy, HICs often underperform in this area. For example, the proportion of electricity generated from coal remains notably high for sustainability leaders like Germany and Denmark, who exceed their cluster's GA and are higher than that of other clusters. Although coal use has gradually decreased in these countries, they have shifted toward other fossil fuels for energy production.

Food security: Data confirms a substantial global decline in agriculture's share of GDP over time, reflecting a general trend of agricultural transformation and structural change. UMICs show an average agricultural share of GDP at around 10%, indicating a significant shift towards industry and service sectors and reflecting a more advanced stage of Modern Economic Growth (Kuznets, 1973). Although agriculture remains more prominent in LMICs than in UMICs, they exhibit a similar pattern, with agricultural land use and agriculture's share of GDP decreasing, indicating an ongoing shift toward other economic sectors. In contrast, LICs maintain a relatively high agricultural share of GDP and agricultural land use, though these values are also gradually declining.

The similarity in agricultural land and the food production index across income clusters suggests a maintained capability to sustain, or even increase, food production. With a smaller agricultural share of GDP, this points to improvements in land productivity, economic efficiency, and diversification.

Natural capital endowment and management: We focus primarily on one indicator: adjusted savings from natural resource depletion (as a percentage of GNI), which considers net depletion from forests, energy, and minerals. Generally, the results are positive for LICs and LMICs, with most countries falling below their respective GA of 9.7% and 4.7%, indicating decreasing resource depletion. This finding does not contradict the idea that higher poverty levels are often linked to poorer environmental management and resource use. Instead, it may be due to LICs today experiencing a development path different from that of most HICs in the past and given the current planetary crisis, economic growth less driven by resource depletion is positive for sustainability.

However, there are exceptions. For instance, Somalia (LIC) has a resource depletion rate of 19.6%, which is double the cluster's GA of 9.7%. Among LMICs, Timor-Leste has a rate of 24.3%, Algeria 13.7%, Angola 28.7%, and

Congo 28.4%, all of which significantly exceed the cluster's GA of 4.7%. A common characteristic of countries with higher-than-average depletion rates is their dependency on oil or minerals, often combined with poor resource management, political instability, and armed conflicts.

3.2 Social Pillar

Access to services: Only 26.3% of the population in LICs have reliable access to electricity. This limited access restricts human development, making it one of the most accurate indicators of energy poverty and economic activity. Access to clean fuels for cooking, the other available indicator in LICs, is also low, at around 10%. As income levels rise, access to electricity shows marked improvement. For LMICs, the GA access to electricity climbs to 66%. UMICs show even more significant improvements, with most countries achieving high electricity access rates. However, some exceptions, such as Botswana, Namibia, Belize, and Equatorial Guinea, still face lower-than-GA access. HICs typically reach near-universal access to electricity, and data for these countries also includes additional indicators like clean cooking fuels, sanitation, and safe drinking water.

Due to data limitations, assessing drinking water and sanitation access in LICs remains challenging. However, HICs maintain the highest access levels across these essential services. Finally, it is interesting to note that the regression reinforces that access to safely managed sanitation services is important at all income levels.

Demography: The demographic transition is evident in LICs as life expectancy at birth improves and the proportion of the population over age 65 gradually increases. Meanwhile, fertility rates are declining from high to lower fertility. As countries move into higher income brackets, they display more advanced stages of the demographic transition transition. Yet, demographic indicators vary widely in LMICs, reflecting the diverse pace of transition across countries. In UMICs, the transition progresses with more uniform indicators around the GA, showing a convergence toward lower fertility and higher life expectancy. Notably, some oil-rich and island states deviate from the typical patterns, displaying higher fertility rates than their income group averages. This divergence aligns with their economic profiles, where high income is often paired with lower scores on social, environmental, and governance indicators relative to their income-level peers. Finally, life expectancy in HICs is at its highest, averaging 77 years, and fertility rates below the replacement level are associated with population decline.

Education and skills: The GA for school enrollment at the primary level (% of gross) is similar for all income clusters, showing clear progress towards inclusive universal education at fundamental levels. In the regression, this indicator is significant for all income levels and reinforces further the relevance of education, although the level of significance tends to be reduced the higher the income level. However, there are some negative outliers when compared to the bandwidth ranges of peers: Sudan, Somalia, Niger (LICs), and Lebanon (LMIC). UMICs and HICs have no significant outliers based on the income cluster's respective GA for enrollment. Instead, any differences in human capital formation between countries within these clusters are likely rooted in the quality of education, although data constraints do not allow us to include this aspect fully in the scope of the analysis. The main factor to highlight for HICs is that government expenditure on education has a relatively stable GA of 12% over time.

Employment: High levels of informality in the labour market make it challenging to gauge accurate labour force participation and unemployment rates, particularly in regions like the Middle East and Africa (Gatti et al., 2014). As income levels rise, informality typically decreases, and labour statistics become more reliable, resulting in higher recorded unemployment rates. In LICs, the GA for labour force participation stands at 70%, but the formal unemployment rate is 6.2%. For LMICs, the unemployment GA is 7.5%, while for UMICs, it reaches 11%. Despite this, many African countries and island states within the LMICs and UMICs remain among the lowest performers in labour market indicators. Oil-rich and Latin American countries tend to show the lowest labour market performance, mainly due to the persistence of informality in specific sectors.

Health and nutrition: Nutrition indicators and child mortality rates reveal a closely linked pattern across income clusters. In LICs, high levels of undernourishment, with most countries exceeding 30%, directly contribute to elevated child mortality rates, as poor nutrition undermines children's immune systems and causes stunted growth, increasing their vulnerability to illness. Somalia, for instance, has an undernourishment rate of 63%, which aligns with its high child mortality rate. Compounding this, LICs also face the paradox of a growing overweight population, with a GA of 24%, suggesting a dual burden of malnutrition.

While child mortality rates in LMICs remain high at 55 deaths per 1,000 live births, undernourishment begins to decrease slightly with a GA of 15%. However, overweight prevalence rises to 36%, showing that as some countries progress economically, changes in diet and lifestyle contribute to both undernutrition and overnutrition. Poor nutrition continues to be a significant factor in child mortality among low-performers in this group, such as Bolivia, Timor-Leste, Angola, Congo, and Tanzania. UMICs see improvements in child mortality, with rates dropping to a

GA of 29.7 deaths per 1,000 live births. This decrease is likely due to enhanced access to essential health services and improved nutrition as undernourishment continues to decline. However, overweight prevalence rises considerably, reflecting a shift in dietary patterns often observed as countries grow wealthier (Templin et al., 2019).

In HICs, where child mortality and undernourishment rates are nearly negligible (close to 0 when excluding outliers), the nutrition landscape is dominated by issues related to overweight and obesity, indicating that while child mortality is no longer a significant concern, other health risks associated with poor diet persist. These patterns underscore the critical link between reduced undernourishment consistently aligning with lower child mortality.

In the regression, the indicator relationship for the prevalence of undernourishment is negative for LICs and LMICs. This is unexpected as it would mean an increase in undernourishment leads to a more positive ranking position. The symbol gets inverted for UMICs and HICs. This counterintuitive finding can be due to data quality and availability.

3.3 Governance Pillar

Economic environment: GDP growth rates reveal notable differences across income clusters, with LMICs and UMICs generally experiencing higher growth than HICs. For LMICs, the GA is 4.1%, and for UMICs, it is slightly lower at 3.25%. In contrast, HICs have the lowest annual average growth rate at 1.97%. LICs maintain positive growth overall, with a GA of 3.9%. Even LICs that fall below this average still report around 2% annual growth, demonstrating economic resilience in the face of structural challenges. This pattern indicates a trend where average yearly GDP growth tends to decrease as income levels increase.

The negative growth observed in countries like South Sudan, Syria, and Yemen aligns with prior findings highlighting these nations as underperformers in areas such as employment and natural resource management. This correlation underscores the substantial structural issues these countries face, suggesting a need for focused interventions to prevent these challenges from affecting other dimensions of development. Finally, GDP growth is clearly significant in the regression at all income levels with a negative relationship, which suggests that an improvement in GDP growth would lead to an improvement in the governance pillar and the ranking.

Gender: The concept of a 'glass ceiling' is evident in persistent gender inequalities across countries, regardless of income level. Although progress has been made, barriers remain. In LICs and LMICs, gender disparities are pronounced, with low percentages of seats held by women in national parliaments and low female-to-male labour force participation ratios. In UMICs and HICs also, where the GA for parliamentary representation by women rises to 18.4% and 21.6%, respectively, these levels remain modest, underscoring the presence of a glass ceiling that restricts women's representation.

Education data highlights early-stage gender inequality. The Gender Parity Index (GPI), which shows whether girls are disadvantaged (values below 1), reveals that gender disparities start early. GPI data is not available for LICs, but in LMICs, values fall below 1, indicating disadvantages for girls at primary and secondary education levels. In contrast, UMICs and HICs report a GPI of 1, suggesting gender equality in education opportunities for children. However, despite this equality in educational access, other indicators reveal that gender barriers persist into adulthood, limiting women's advancement in political and economic spheres.

In the regression, the gender dimension presents multiple significant findings. For the proportion of seats held by women in parliament, significance levels are always present, as is the negative inverted relationship. School enrollment measured by GPI index is available for LMICs, UMICs, and HICs. It is individually significant for LMICs, but for UMICs and HICs it is only significant when part of the model using the F test.

Government effectiveness, human rights, stability, and rule of law:[2] We use six key indicators to assess governance and institutional quality: control of corruption, government effectiveness, political stability and absence of violence, regulatory quality, rule of law, and voice and accountability. Each indicator is scored on a scale from -2.5 to 2.5. Generally, these scores improve as national income levels rise, revealing a positive correlation between income and institutional quality.

In LICs, all indicators have a GA below -1, with negative values across individual country means, indicating weak governance and institutional structures. However, LMICs also show negative GAs with slightly higher values ranging from -0.65 to -0.4 across individual countries. For UMICs, institutional scores improve further, with GAs from -0.25 to nearly 0. Some UMICs even have positive individual scores, reflecting pockets of stronger institutional capacity.

The shift is more pronounced in HICs, where the GA is positive and approaches 1, suggesting overall higher

[2] We merge these indicators as they are interdependent and have the same range of scores. Disentangling them is difficult and repetitive.

institutional quality. However, substantial variation exists between countries within this group. Control of corruption shows the widest range, with scores spanning from -0.3 to 2.3, the latter approaching a near-perfect score. A notable trend across all income clusters is that island states, oil-rich nations, and certain European countries considered 'peripheral', such as Italy, Spain, and the Czech Republic, tend to score below their group averages (Magone et al., 2016, p. 1).

The regressions shed some more light on the weight and importance of the different related indicators depending on the income level. Government effectiveness is quite significant individually for LMICs and UMICs, the sets of countries that could be seen as being in a transition phase in their development. Regulatory quality is only individually significant for HICs and presents an expected relationship that the better the regulatory quality, the better the outcome. For LICs, LMICs, and UMICs, the indicator is significant at the model level, which we interpret as the priorities for these countries are more impactful in other areas, such as government effectiveness. Voice and accountability seem to be an interesting indicator that needs further study as it is not significant at the individual level for UMICs only. The control of corruption indicator is only significant at the model level, which we believe can be explained by a lack of data, although it could be interesting to explore further. Finally, the regression suggests that the political stability and absence of violence indicator is important at all income levels, supporting the idea that the more stable the country is, the more likely it is to improve its performance.

Innovation: For LICs and LMICs, the primary innovation indicator available is scientific and technical journal articles, with progress largely stagnating between 2000 and 2020. Within the LIC group, Ethiopia and Uganda also demonstrate notable progress with 677 and 385 articles, respectively, compared to the GA of 93. While their achievements may seem like outliers, they are supported by strong government involvement in innovation, particularly in agricultural research, and by high school enrollment and employment (Ortiz et al., 2013). This progress illustrates that targeted support can drive scientific output even in countries with limited resources. Within the LMIC group, India stands out as a contributor to global innovation and has published an impressive 68,952 articles, far surpassing the GA of 2,599. This achievement reflects India's large population and robust educational and research infrastructure.

In the UMIC group, China has positioned itself as a global leader in innovation, with R&D expenditure reaching 1.67%, significantly higher than the GA of 0.445%. China also excels in patent applications and scientific publications, underscoring its commitment to becoming a global powerhouse in research and development. As expected, HICs generally maintain the highest GAs and individual country scores across all innovation metrics. However, China's exceptional performance across R&D, patents, and publications also sets it as a benchmark for HICs, illustrating how emerging economies can lead to scientific and technological advancements. The coefficients related to innovation are always highly significant at the individual level and have a big magnitude in the regressions, which further reinforces the idea that R&D is crucial for development.

4. Discussion

Our explorative interrogation of the Portal shows how the status of Sovereign ESG development varies significantly between income-based country clusters and among individual countries within clusters. Differences between clusters confirm previous findings of a strong relationship between nation-states' income levels as a proxy for development, on the one hand, and their ability to meet the goals of Agenda 2030 and make progress towards TC, on the other hand (Gratcheva et al., 2021a 2021b; Khoury et al., 2022). In essence, HICs generally display better governance indicators and have greater capacity to manage environmental and social challenges due to more developed institutional frameworks and financial resources. There is a clear cut-off point in improvements and data quality starting from the UMIC level, compromising the analysis of non-HICs' TC trajectories.

Further, LMICs present high heterogeneity at many levels when comparing individual country means to GA and bandwidth of values within indicators. This heterogeneity supports Jiang et al. (2022) argument that polarization on paths starts in earlier development stages. Consequently, global goals and aims for sustainable transitions may not fit the expectations of low-income vis-a-vis high-income countries equally (D'Alessandro & Besada, 2019, p. 384). Countries and country clusters may have different priorities and rates of change and, therefore, different understandings of how and when to achieve TC (Shrivastava et al., 2020; Siegel & Lima, 2020; Stringer et al., 2020).

We confirm basic facts about the trade-offs between the three ESG pillars nation-states must consider as their interaction renders a variety of pathways possible, some of which may not lead to sustainable futures. However, the exercise is far from straightforward (Deacon, 2016; Patton, 2021; Ungar, 2021, p. 46). For the environmental pillar, HICs are often the largest consumers and polluters. At the same time, LICs and LMICs struggle with managing natural resources sustainably due to dependence on fossil fuels and subsistence farming. In social terms,

LICs and LMICs face considerable challenges related to food security, essential service provision, and social inequality, exacerbated by limited data availability for accurate assessments. The governance pillar indicators, such as political stability and corruption control, tend to improve as income levels rise, facilitating sustainable policy implementation. The progress toward sustainability, therefore, shows substantial variation based on a country's development stage, with HICs generally better positioned but LICs and LMICs facing significant hurdles.

These hurdles become more visible as we apply the framework linking ESG and SDGs (see Figure 1) and investigate trade-offs. Overall, our findings reinforce evidence related to negative dynamics. For instance, for the environmental pillar, LICs and LMICs rely heavily on fossil fuels and energy exports, which poses a challenge to reducing emissions and managing resources sustainably. Meanwhile, LICs and LMICs show poor performances regarding food security, natural capital endowment, and resource management due to their reliance on subsistence farming, fossil fuels, and energy exports as primary income sources (Gupta et al., 2020). The dependency created by HICs negatively impacts LICs and LMICs in their sustainability path towards TC as they cannot consider the mutual dependence between planetary boundaries and socio-economic activities (Eisenmenger et al., 2020). This result highlights the need for collaboration and solidary economics between governments. To address the Grand Challenges of climate change and biodiversity loss, governments must adopt holistic and inclusive sustainability (SDGs 7, 12, 13, 14, and 15) through international collaboration and realize that individual countries cleaning their indicators is insufficient for global progress (Mott et al., 2021; Sachs, 2012). While there have been multiple attempts at the COP meetings, it is evident that these challenges have not been sufficiently addressed (UNFCC, 2023). Finally, high pollution and unsustainable use of resources by HICs impact global sustainability, creating a harmful dependency that limits LICs' capacity to progress.

Another hurdle is the lack of comprehensive and accurate data on poverty, inequality, and access to essential services, which blocks the effective targeting of social programs and prevents a clear understanding of progress. This issue is compounded by disparities in human capital, where low education and skills development reduce the potential for economic and social advancement. As mentioned in Section 2, despite the recognized relevance of reducing inequality for progress and sustainable development, once data gaps are removed from the clusters, no indicators for poverty and inequality are directly tied to SDGs 1, 2, 3, 8, and 10. This lack of indicators generates several negative spillovers as lack of data and accuracy generates poor categorization, incorrect social assistance distribution, and incapacity to alleviate poverty and its negative consequences (Iskandar et al., 2023).

Similar consequences apply to access and quality of essential services directly tied to SDGs 3, 6, 10, and 11. With the current data scenario, carrying out global or regional analysis is challenging as comparable global indicators are not widely available. In some instances, data becomes available if taken from national sources. Hence, statistical offices must promote unification exercises requiring substantial resources and multi-level coordination. The same logic applies to the education and skills dimension related to SDGs 4, 8, and 11, where the only available indicator for all income clusters is school enrollment at the primary level (% of gross). Still, countries that show positive tendencies even in this constricted variable analysis will probably have better outcomes toward TC if current tendencies continue (Kopnina, 2020). Also, there are multiple positive spillovers from human capital formation, such as the more educated a population, the better the economic environment, and the more likely a sectorial shift towards knowledge-based TC (Nasibulina, 2015).

Further, our study reiterates the relationship between the social and governance dimensions and progress towards TC. Values in these dimensions have the strongest correlations with development levels and income as a proxy, and this is particularly relevant for LICs and UMICs. For LICs, both social and governance pillars are blocking progress towards TC, with a big focus on social conditions. For UMICs, government effectiveness, efficiency, and protection of human rights related to the governance pillar are the main obstacles to progress towards sustainability and TC. The Sovereign ESG framework suggests that pushing institutional capacity and building trust is a fundamental step towards TC (Deacon, 2016; Ghosh et al., 2021). However, indicators are often unavailable, or individual country's trends are only slowly improving. This problem is crucial as, despite the progress shown in UMIC countries, an inclusive society can only emerge with inclusive democracy. An example of this delayed progress in inclusiveness is the persistent glass ceiling related to gender disparities. In short, governance challenges, particularly in LICs and some UMICs, include weak institutional capacity, corruption, and limited human rights protections. These governance issues block TC as they hinder the development and enforcement of policies to advance equitable and inclusive development.

5. Conclusion

In the current era of planetary crisis, international agreements rely on commitments by individual countries and governments. For nation-states to act as critical enablers of holistic and inclusive sustainable development, they

must have conceptual frameworks guiding public policy and statistical tools to evaluate their status and advancements along sustainable pathways. The primary motivation of this study was to investigate to what extent the Sovereign ESG framework can guide nation-states towards TC. To that end, we conducted an exploratory quantitative analysis of the World Bank Sovereign ESG Data Portal to learn, first, to what extent it can tell us about the status and development trajectories of different income clusters and individual countries and, second, what aspects constitute the main hurdles for progress in the sustainability dimension.

We find that broadly speaking, the Sovereign ESG framework and data portal can provide valuable insights for policy-making and support nation-states' development along TC trajectories. We identify five main takeaways where the Sovereign ESG framework can play a role. 1) To identify priority areas by analyzing the Portal's ESG metrics, such as natural resource management in LMICs or governance enhancement in UMICs. This targeted approach enables more effective resource allocation. 2) To facilitate cross–country comparisons as the Sovereign ESG framework allows countries to benchmark their performance against peers in similar income or development clusters, offering a realistic basis for progress rather than unrealistic comparisons with HICs. 3) To promote international collaboration as the Sovereign ESG data emphasizes the interdependence between countries, particularly regarding global environmental and social challenges. This includes recognizing the need to support LICs and LMICs from predatory behaviour by HICs to achieve sustainable development. 4) To strengthen institutional capacity as governance indicators within the Sovereign ESG framework can highlight areas where institutional reforms are necessary, helping countries build more vital, transparent institutions supporting inclusive democracy and sustainable growth. This effort is crucial for inclusive society-building, as highlighted by challenges such as gender disparities and social inequality. 5) To contextualize global standards as the Sovereign ESG framework underscores the importance of adapting global sustainability standards to reflect national realities. This contextual approach helps countries set achievable targets that align with their development stage rather than striving for universal targets that may be unfeasible for LICs and LMICs.

We conclude that the Sovereign ESG framework offers a structured approach for assessing and advancing the ESG dimensions. It can support nation-states in making tailored progress toward TC while fostering an understanding of their unique challenges and capacities. Notwithstanding, there is room for improvement in terms of conceptual understanding and usefulness of measurements, and we end with six policy-related suggestions.

First, the current data availability in the Portal is highly uneven between countries belonging to different income clusters, pointing to the severe challenges for lower-income countries to produce relevant and good statistics. We suggest that for the Portal to reach its full potential, the statistical inequality between HICs and lower-income clusters must be resolved or, at least, reduced.

Second, we need a more open debate regarding the trade-offs between the three pillars, especially because the environmental indicators currently show the least progress and even backlash. In a time of Grand Challenges of climate change and biodiversity loss, we suggest reconsidering our priorities and recognizing that socio-economic and political progress can only occur within existing planetary boundaries.

Third, while nation-states are key actors driving TC, they depend on global collective action. At a time when we need joint solutions for sustainability, we instead experience increasing polarization, protectionism, and conflict. We suggest that improved global cooperation and solidarity will impact nation-states' TC trajectories positively, directly, and significantly.

Fourth, expectations for countries with higher income levels and development stages able to focus on targets beyond growth and social stability should differ from those still lagging (Mazzucato, 2018). We suggest that the sustainability agenda should more systematically contextualize the situations for individual nation-states and recognize their different development levels and prioritizations, for example, by comparing countries with their closest peers and using bandwidths and ranges that are realistic for different realities.

Fifth, Ashgar et al. (2022) argue that providing people living in poverty access to clean and affordable power is a viable way to reduce poverty. Considering that our study's most severe data gap is the lack of usable indicators for energy and security and poverty and inequality, we suggest that policymakers should push for investment in the production of administrative data using novel technologies, such as geospatial data, remote sensing, and AI. Successful TC depends on providing the poorest segments of the population alternatives to sourcing energy from natural capital on which their livelihoods depend.

Finally, for further research, we suggest producing a battery of indicators that link the Sovereign ESG and SDG indicators at the local level. We believe this can bring new perspectives to understanding the trade-offs between environment and development at the level of people's lived experiences.

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Appendix A – List of countries according to their income classification

Table A1. Low-income countries

Afghanistan	Guinea Bissau	Somalia
Burkina Faso	Korea, Dem. People's Rep.	South Sudan
Burundi	Liberia	Sudan
Central African Republic	Madagascar	Syrian Arabic Rep.
Chad	Malawi	Togo
Congo, Dem. Rep.	Mali	Uganda
Eritrea	Mozambique	Yemen
Ethiopia	Niger	Zambia
Gambia	Rwanda	
Guinea	Sierra Leone	

Source: World Bank Data Help Desk (2022).

Table A2. Lower-middle income countries

Angola	India	Philippines
Algeria	Indonesia	Samoa
Bangladesh	Iran, Islamic Rep.	São Tomé and Principe
Benin	Kenya	Senegal
Bhutan	Kiribati	Solomon Islands
Bolivia	Kyrgyz Rep.	Sri Lanka
Cabo Verde	Lao PDR	Tanzania
Cambodia	Lebanon	Tajikistan
Cameroon	Lesotho	Timor-Leste
Comoros	Mauritania	Tunisia
Congo, Rep.	Micronesia, Fed. Sts.	Ukraine
Côte d'Ivoire	Mongolia	Uzbekistan
Djibouti	Morocco	Vanuatu
Egypt. Arab Rep.	Myanmar	Vietnam
El Salvador	Nepal	West Bank and Gaza
Eswatini	Nicaragua	Zimbabwe
Ghana	Nigeria	
Haiti	Pakistan	
Honduras	Papua New Guinea	

Source: World Bank Data Help Desk (2022).

Table A3. Upper-middle-income countries

Albania	Fiji	Namibia
American Samoa	Gabon	North Macedonia
Argentina	Georgia	Palau
Armenia	Grenada	Paraguay
Azerbaijan	Guatemala	Peru

Belize	Iraq	Russia
Bosnia and Herzegovina	Jamaica	Serbia
Botswana	Jordan	South Africa
Brazil	Kazakhstan	St. Lucia
Bulgaria	Kosovo	St. Vincent and the Grenadines
China	Libya	Suriname
Colombia	Malaysia	Thailand
Costa Rica	Madives	Tonga
Cuba	Marshall Islands	Türkiye
Dominica	Mauritius	Turkmenistan
Dominican Rep.	Mexico	Tuvalu
Equatorial Guinea	Moldova	
Ecuador	Montenegro	

Source: World Bank Data Help Desk (2022).

Table A4. High-income countries

Andorra	Greece	Poland
Antigua and Barbuda	Greenland	Portugal
Aruba	Guam	Puerto Rico
Australia	Hong Kong SAR, China	Quatar
Austria	Hungary	Romania
Bahamas	Iceland	San Marino
Bahrain	Ireland	Saudi Arabia
Barbados	Isle of Man	Seychelles
Belgium	Israel	Singapore
Bermuda	Italy	Sint Maarten
British Virgin Islands	Japan	Slovak Rep.
Brunei Darussalam	Korea, Rep.	Slovenia
Canada	Kuwait	Spain
Cayman Islands	Latvia	St. Kitts and Nevis
Channel Islands	Liechtenstein	St. Martin (French part)
Chile	Lithuania	Sweden
Croatia	Luxembourg	Switzerland
Curacao	Macao SAR, China	Taiwan, China
Cyprus	Malta	Trinidad and Tobago
Czech Rep.	Monaco	Turks and Caicos Islands
Denmark	Nauru	United Arab Emirates
Estonia	Netherlands	United Kingdom
Faroe Islands	New Caledonia	United States
Finland	New Zealand	Uruguay
France	Northern Mariana Islands	Virgin islands (U.S.)
French Polynesia	Norway	

Germany	Oman	
Gibraltar	Panama	

Source: World Bank Data Help Desk (2022).

Appendix B: World Bank Sovereign ESG Data Portal indicators per pillar and dimension

While the World Bank Sovereign ESG Data Portal mentions 135 indicators, when downloading the data, only 72 are available. Below, we list the available indicators and we underline the 45 indicators we use in this study based on our selection criteria outlined in Section 2.

Environment pillar

Emissions & pollution

- CO2 emissions (metric tons per capita)
- CO2 emissions (kt)
- GHG net emissions/removals by LUCF (Mt of CO2 equivalent)
- Methane emissions (metric tons of CO2 equivalent per capita)
- Nitrous oxide emissions (metric tons of CO2 equivalent per capita)
- PM2.5 air pollution, mean annual exposure (micrograms per cubic meter)

Energy use & security

- Electricity production from coal sources (% of total)
- Energy imports, net (% of energy use)
- Energy intensity level of primary energy (MJ/$2017 PPP GDP)
- Energy use (kg of oil equivalent per capita)
- Fossil fuel energy consumption (% of total)
- Renewable electricity output (% of total electricity output)
- Renewable energy consumption (% of total final energy consumption)

Climate risk & resilience

- Population density (people per sq. km of land area)
- Cooling degree days
- Heating degree days
- Heat index 35
- Standardised precipitation-evapotranspiration index
- Land surface temperature
- Coastal protection
- Level of water stress: freshwater withdrawal as a proportion of available freshwater resources
- Proportion of bodies of water with good ambient water quality

Food Security

- Agricultural land (% of land area)
- Agriculture, forestry, and fishing, value added (% of GDP)
- Food production index (2014-2016 = 100)

Natural capital endowment & management

- Adjusted savings: natural resources depletion (% of GNI)
- Adjusted savings: net forest depletion (% of GNI)
- Annual freshwater withdrawals, total (% of internal resources)
- Forest area (% of land area)
- Mammal species, threatened
- Terrestrial and marine protected areas (% of total territorial area)
- Tree cover loss

Social pillar

Access to Services

- Access to clean fuels and technologies for cooking (% of population)
- Access to electricity (% of population)
- People using safely managed drinking water services (% of population)
- People using safely managed sanitation services (% of population)

Demography

- Fertility rate, total (births per woman)
- Life expectancy at birth, total (years)
- Population ages 65 and above (% of total population)

Education & skills

- Government expenditure on education, total (% of government expenditure)
- Literacy rate, adult total (% of people ages 15 and above)
- School enrollment, primary (% gross)

Employment

- Children in employment, total (% of children ages 7-14).
- Labour force participation rate, total (% of total population ages 15-64) (modelled ILO estimate)
- Unemployment, total (% of total labour force) (modelled ILO estimate)

Health & Nutrition

- Cause of death, by communicable diseases and maternal, prenatal and nutrition conditions (% of total)
- Hospital beds (per 1,000 people)
- Mortality rate, under-5 (per 1,000 live births)
- Prevalence of overweight (% of adults)
- Prevalence of undernourishment (% of population)

Poverty & Inequality

- Annualized average growth rate in per capita real survey mean consumption or income, total population (%)
- Gini index
- Income share held by lowest 20%
- Poverty headcount ratio at national poverty lines (% of population)

Governance pillar

Economic Environment

- GDP growth (annual %)
- Individuals using the Internet (% of population)

Gender

- Proportion of seats held by women in national parliaments (%)
- Ratio of female to male labour force participation rate (%) (modeled ILO estimate)
- School enrollment, primary and secondary (gross), gender parity index (GPI)
- Unmet need for contraception (% of married women ages 15-49)

Government Effectiveness

- Government effectiveness: estimate
- Regulatory quality: estimate

Human Rights

- Strength of legal rights index (0=weak to 12=strong)
- Voice and accountability: estimate
- Economic and social rights performance score new

Innovation

- Patent applications, residents
- Research and development expenditure (% of GDP)
- Scientific and technical journal articles

Stability & Rule of Law

- Control of corruption: estimate
- Net migration
- Political stability and absence of violence/terrorism: estimate
- Rule of law: estimate

Appendix C - Heatmaps

The heatmaps contain the detailed results from our empirical exploratory quantitative study of the World Bank Sovereign ESH Data Portal. We fill cells in blue if the individual country mean is below the cluster's GA and in purple if it is *above* the GA. The colours are proportionally lighter the further the country men is from the GA and proportionally darker the closer to the GA. All heatmaps can be accessed through the below links.

- Environmental pillar: https://figshare.com/articles/figure/Appendix_C-Sovereign_ESG_Environmental_pillar_heatmaps/25998313
- Social pillar: https://figshare.com/articles/figure/Appendix_C-Sovereign_ESG_Social_pillar_heatmaps/25998325
- Governance pillar: https://figshare.com/articles/figure/Appendix_C-Sovereign_ESG_Governance_pillar_heatmaps/25998331

Appendix D – Regression results

- Environmental pillar: https://figshare.com/articles/journal_contribution/Appendix_D_Regressions_of_ranking_Environment/28077422
- Social pillar: https://figshare.com/articles/journal_contribution/Appendix_D_Regression_of_ranking_Social/28077440
- Governance pillar: https://figshare.com/articles/journal_contribution/Appendix_D_Regression_of_ranking_Governance/28077443

Appendix E – Summary of the Sustainable Development Goals (SDG)

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Data sharing statement

No additional data are available.