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ESG Data Governance and Oversight in Asset Management: A Primer

Stefano Maffina
Senior ESG Research and Data Analyst

Jean Zhou
Senior ESG Quant and Data Analyst

STATE STREET GLOBAL ADVISORS

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1 Introduction

State Street Global Advisors uses a wide range of environmental, social and governance (ESG) datasets, metrics, indicators and tools to power quantitative scoring models and reports, to answer to regulatory requirements, and to drive engagement and stewardship activities. In this piece, we discuss how we assess the robustness, correctness, precision, and trustworthiness of our data.

State Street Global Advisors has built granular processes and standardized systems to provide ongoing data quality controls, including robust reporting and internal committees to oversee the correct deployment of models. We also aim to standardize data distribution to all internal stakeholders, which allows us to avoid discrepancies and inconsistencies when handling or displaying results. This primer provides a high-level overview of some of our main governance, management, and oversight practices, such as:

- Pre-onboarding and scrutinizing new datasets
- Performing ongoing management of data updates
- Overseeing the employment of data points as drivers of models and scoring mechanisms
- Distributing metrics appropriately to internal stakeholders

By having clear governance and oversight processes in place that can identify and correct potential mistakes before erroneous data is employed, we can help ensure that our clients' objectives are being met as intended.

2 Due Diligence on New Data, and Testing and Selection of Datasets

When deciding whether to employ a new dataset or tool, the State Street Global Advisors ESG Research and Data team engages with vendors' data and technical teams. We acquire information on the capabilities and peculiarities of the dataset/tool. We also explore how the information could be onboarded, learn how the vendor would provide recurring updates and fix potential issues and mistakes, and evaluate sample dataset files to get acquainted with the information, metrics, and indicators.

To determine whether to move forward with contractual negotiations, the ESG Research and Data team poses key questions, including the following:

- How many data products does the vendor support?
- What is the core methodology of the dataset/tool, and can the vendor provide solid and thorough documentation?
- What is the coverage for each data product?
- What is the time series for each data product?
- What is the size of the analyst team? Average tenure?
- How is the analyst team organized? By industry, sector, region, or other?
- How does the methodology identify peer groups? By industries, regions, or other?
- Which industry classification does the provider use to group and normalize the data?
- Does the vendor provide a FactSet feed and raw data?
- Is additional data available through other platforms?
- Does the vendor have a proprietary web-based screening tool?
- Does the vendor have a proprietary carbon footprint screening tool?
- Could the vendor provide us with information on estimation methodology? Is there accompanying documentation?
- What is the vendor's relationship with the companies it evaluates? Does the provider receive any sort of compensation from them? What is the procedure when a company objects to the vendor's findings?

- Does the vendor supply data for fixed income products? Public and private equities? Sovereign debt? Securitized debt? Municipal debt? What about other asset classes?
- What percentage of their indicators is made up of quantitative metrics instead of qualitative issues and Boolean yes/no factors?
- Is there a system in place to evaluate data integrity and review analysts' work?
- What percentage of data is taken from a company-related source and delivered without further investigation?
- Does the vendor normalize historical scores? How is that process integrated into scoring models?
- Does the vendor notify data subscribers about changes in data feeds, structure, delivery, or methodology? How often?
- When the vendor conducts primary research and holds in-person meetings or calls with company representatives, is there a systematic approach to data collection and company engagement?
- How often does the vendor update company research and ratings? Daily? Weekly? Monthly? Annually?
- Commercial questions: Are there fees for access points? What are data delivery protocols?

These questions help us make a final assessment of the vendor's capabilities. From there, the ESG Research and Data team works alongside the State Street Global Advisors Procurement, Legal, and Market Data Services team to obtain favorable contractual agreements with the vendor, and to make sure that all required use cases for the data or information are included in the finalized contract.

3 Data Onboarding and Implementation

The ESG Research and Data team works closely with the State Street Global Advisors Information Technology team to onboard, maintain, update, and oversee all ESG data that is stored in the firm's centralized research database, known as the production database. All external ESG information is uploaded to the production database using feeds from the vendors. The feeds occur on a recurring basis (usually monthly or quarterly).

The teams validate results and perform analysis to make sure that data is loaded and stored correctly, mapping logic is sound, and the solution meets all business requirements.

Onboarding the Data

When introducing a new or modified dataset, our ESG Research and Data team imports the new information into the database "sandbox" or testing environment. This information features raw data (including historical data), information to map the data to various market identifiers (see discussion of "Views" below), built-in logic for time-series data, and data processing logic such as data normalization.

Once the ESG Research and Data team signs off that data has accurately been transferred into the firm's systems, the IT team has a green light to transpose the views into State Street Global Advisors' "live" production environment. The IT team also builds automated feed loading or data replication procedures, as well as schedule loader and monitoring jobs, to eliminate manual processes as much as possible.

The Presentation of the Data

The production database contains both tables and views. The main difference between the two is that tables store the physical data that largely reflects the original formatting and information contained on data feeds directly shared by external vendors. By contrast, views are "treated" with conceptual layer logic for end users, which incorporates specific processes, mapping dimensions (for example, mapping to multiple holding-level or company-level identifiers), dating conventions (for example, listing each monthly update using a specific business day for ease of use and consistency), and potentially point-in-time reasoning or other treatments and criteria. Views are built to standardize data usage across several platforms, systems, and asset classes, and to make it easier for users to leverage the information in a comprehensive, robust, and consistent manner.

Feed loaders are automated to onboard new information at a set frequency, and to populate tables and views in the firm's ESG Research database. There, views have been set up to map all of the data points to various identifiers (including ISIN, CUSIP, SEDOL, FactSet Permanent IDs, and Bloomberg Company IDs), and to equity and fixed income holdings. The information in the views is then piped to needed downstream users and applications, including investment team and portfolio management tools, risk management and client reporting platforms, and FactSet and Bloomberg uploads. All of those different applications and tools receive the information from one centralized location, known as "the production database," to maintain consistency, integrity, standardization, and robustness, and to avoid any potential discrepancy in terms of hierarchical corporate ownership information, as well as dating conventions.

The Procedure for Vendor Updates

If vendors update methodology or data structure, notifications are sent to the ESG Research and Data team before the production change (lead time for changes is estimated at three months). This lead time allows the team to assess the business impact and the required IT changes. If the change is related to feed file format, we also recommend sample files along with the notifications to enable the IT team to test updated codes in a development environment. The ESG Research and Data team will also ask the vendor for historical data that has been adjusted with the new methodology or new data points.

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Model Transparency and Supporting Collateral

Each quantitative model, scoring mechanism, or similar tool from the ESG Research and Data team is supported by thorough and transparent collateral, including specific methodology documents that guide readers through the rationale and function of the model. Other supporting documentation includes FAQs for clients and internal stakeholders, as well as marketing papers identifying the scope and purpose of the model, the breadth of its capabilities, the pros and cons of the model, and recent or planned updates or enhancements.

Some calculation and modeling decisions remain proprietary to comply with external vendors' contractual agreements and to protect the firm's intellectual property. Even so, the ESG Research and Data team is able to provide extensive transparency around our models.

We write comprehensive methodology guides and update them under a standard cadence, as well as any time modeling changes or enhancements that occur. In addition to those key documents, the ESG Research and Data team has released high-level primers and introductory papers, which aim to distill key highlights as well as the reasoning, goals, and primary use cases behind each model.

Other collateral includes custom and bespoke client-facing presentations, which apply specific data and models to particular universes or portfolios. We also provide clients with FAQ guides and more practically oriented papers that focus on empirical analysis and pragmatic evidence, as well as comparative analysis such as deltas in coverage or correlations between different models and vendors.

5 Ensuring Data Quality

Gap Filling

Most ESG data in the production database is not altered or modified compared to the feeds received directly via sFTP or similar channels from external data vendors. However, the ESG Research and Data team consults with the firm's investment teams to discuss the potential need for the adoption of "gap-filling" techniques. These might be necessary if specific datasets or metrics have subpar or lower than necessary coverage, thereby necessitating estimations of data for certain holdings. Gap-filling techniques are applied to several widely used climate metrics. Indeed, the ESG Research and Data team may choose to generate estimated or proxy data to code into the production database. This may occur after comprehensive discussions between the ESG Research and Data team, the IT team, and all internal downstream users.

For instance, the IT and ESG Research and Data teams have been generating Global Industry Classification Standard (GICS) subindustry median results that can be plugged in as proxies for climate data providers' specific indicators, such as the S&P Trucost carbon intensity metric and the FTSE Russell Green Revenues model. Companies that do not receive a result directly from the vendor are assigned a zero numerical result for the S&P Trucost and FTSE Russell metrics. Then, GICS subindustry medians are used and shared in conjunction with standard climate data to all downstream applications and other internal data users who adopt the same rationale.

Additional Metrics and "Views"

State Street Global Advisors may implement its own calculations to create additional data points that we deem useful for our investment teams.

EVIC

After consulting with several investment teams, the ESG Research and Data team in 2022 decided to create Enterprise Value Including Cash (EVIC) normalized greenhouse gas (GHG) emissions results. Most vendors provide carbon emissions data that is normalized by market cap or by revenue. However, more recently, regulations and frameworks such as the Task Force on Climate-Related Financial Disclosures have moved to prioritize intensity metrics with EVIC as the denominator.

EVIC is an upgrade to traditional market cap data for several reasons. Primarily, EVIC makes it possible to have a more accurate and more comprehensive representation of a company's total value. Since enterprise value also takes into account the amount of debt that the company has taken on, it can be more easily employed for fixed income and multi-asset strategies, whereas traditional market cap data is only relevant for equities.

If external climate data providers deliver off-the-shelf versions of carbon intensity metrics normalized by EVIC, the ESG Research and Data team adopts those results without any additional changes or edits. However, if the vendors do not offer those capabilities, the IT and ESG Research and Data teams calculate the results by dividing volume-based GHG emissions data (sourced from those same vendors) by EVIC information (sourced from Refinitiv Worldscope).

The ESG Research and Data and IT teams had in-depth discussions with various investment teams' research groups to agree on the rules and criteria for calculating those EVIC-normalized intensity results, as well as to craft and employ missing data treatments.

Case 1 : Carbon emissions are available; EVIC is missing

- Fill EVIC with $median_{sub\text{-}industry}\left(\frac{EVIC}{Revenue}\right) * revenue$
- Revenue of missing company comes from Trucost table

Case 2 : Carbon emissions are missing; EVIC is available

- Populate sub-industry medians for $\frac{Carbon\ Emissions}{EVIC}$
- Fill carbon intensity directly with $median_{sub\text{-}industry}\left(\frac{Carbon\ Emissions}{EVIC}\right)$

Case 3 : Both carbon emissions and EVIC are missing

- Populate sub-industry medians for $\frac{Carbon\ Emissions}{EVIC}$
- Fill carbon intensity directly with $median_{sub\text{-}industry}\left(\frac{Carbon\ Emissions}{EVIC}\right)$

Point-in-Time Views

State Street Global Advisors has also addressed the lack of point-in-time (PIT) views for specific ESG datasets. Without PIT views, vendors may backfill information or regenerate history to produce data.

For example, S&P Trucost revises historical data when it feels that new information has come to light, chooses to slightly modify its methodology, or identifies past errors or mistakes. Since the revisions occurred after the original information was employed to either drive investable strategies or build reports, querying the revised historical data could lead to discrepancies or potential issues in explaining why the investable strategies or reports display historical results that are not in line with expectations. To avoid those pitfalls, the ESG Research and Data and IT teams have created additional views in production that adopt a PIT rationale, meaning that there are no historical restatements or backfilling of data. The information is presented exactly as it was delivered on a particular date. Non-PIT views with the most recent versions of historical data are also available if needed by investment teams for back-testing purposes.

Adjusting Data Frequency

In some cases, external vendors may provide data feed updates at a higher frequency than monthly. For example, several climate datasets are generated and shared on a weekly basis. However, those results remain mostly static from week to week. Furthermore, most internal systems (such as those using the data for investment purposes or client reporting) only require monthly updates. Consequently, the ESG Research and Data and IT teams have created consolidated monthly views that display only one update per month (rather than one per week) for all vendors. These updates are displayed on a set day of the month, allowing downstream users access to more streamlined and relevant information, and avoiding clutter and noise.

Like PIT views, monthly views do not entirely substitute or replace the tables and views that ingest all of the data forwarded by external vendors. Tables and views with information provided "as is" are also onboarded into the database for completeness and to provide thorough information for internal stakeholders.

6 Internal Committees and Modeling Oversight

For State Street Global Advisors-owned models, such as the R-Factor scoring mechanism, the ESG Research and Data team needs to obtain approval from the following four internal committees:

1. The Investment Committee oversees the investment soundness, implementation, and risk of each model and signs off on the business usage and responsibilities of the model and derived ratings or scores. The Investment Committee also oversees the creation and approval of the firm's investment strategies, including determining the firm's investment philosophy, resolving investment policy issues, and ensuring that each investment discipline remains consistent with the firm's mission.

   The Investment Committee's role includes ensuring that the firm consistently operates within risk controls, reviewing and approving the Principles of Investment Management Manual, reviewing and approving significant model changes, reviewing sub-advised investment strategies, evaluating corporate governance proxy approval issues, addressing major global and economic issues, and considering and approving the closure of strategies.

2. The Technical Committee is a forum for the oversight and review of investment models. This committee oversees data quality and model soundness, and validates the model's inputs and outputs for accuracy and relevance. The Technical Committee's role includes directing and approving new and revised models and serving as a communication pathway for technical modeling matters.

3. The Model Risk Validation Committee's primary function is to provide oversight of model risk within the firm to appropriately manage the risk. At a high level, the committee's responsibilities include overall governance, model identification and inventory, model validation, periodic review, ongoing monitoring, and compensating controls.

   The committee governs the firm's model risk management (MRM) framework within State Street Corporation's MRM framework. The committee performs a thorough parallel review of the code behind the models; conducts an independent validation of data quality, model soundness, code quality, and implementation; and maintains a regular, ongoing oversight of the model, requiring annual reviews, as well as validations for each change or enhancement to the model.

   The ESG Research and Data team is also required to submit a thorough summary of model results to the Model Risk Management team via the official MRM platform each quarter and obtain the MRM team's approval and validation of those results. On top of that, the annual submission of an MRM review questionnaire is required to prove that the model is valid, to prove that it is functioning properly, to show where it is employed (and what AUM of models/funds/strategies are leveraging it), and to determine whether the model has or has not been modified versus the original model.

Each minor change to a model that is not deemed to warrant an expansive Technical Committee or Model Risk Management formal review still needs to be logged in the MRM platform. That platform also contains all governance information, approvals, and changes logged by the business and by model risk validation. That allows each model to have a historical log of all changes, edits, improvements, enhancements, and updates. In this way, internal stakeholders can quickly identify the potential impact of those updates on investable strategies and reports.

4 The ESG Committee was established to oversee the firm's ESG and proxy voting framework and philosophy. The committee's purpose is twofold:

- To oversee the firm's ongoing commitments to ESG and sustainable investing, related business practices, and public policy matters relevant to the firm itself and in its capacity as an asset manager

- To oversee the Asset Stewardship team's proxy voting and issuer engagements on behalf of all of the firm's discretionary portfolios[1]

State Street Corporate Audit often audits State Street Global Advisors' ESG models and processes. The audit verifies that all models are working properly and that all surrounding systems, processes, and procedures are in line with expectations.

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Data Oversight

The ESG Research and Data team, in conjunction with the IT team, has built monthly data quality checks and reports that track historical correlation and coverage dimensions of thousands of individual ESG metrics and scores over time. The metrics cover the entire global universe of issuers tracked by the firm, as well as issuers held within various benchmarks and indices.

The data quality checks occur for both model input and output metrics. The calculated statistics are stored in the production database and visualized using an interactive data visualization software. The software allows internal users to identify any significant historical deltas for various indicators and datasets, any loss of coverage, or any other similar data issues.

These quality checks are mostly divided into two key areas: correlation and coverage:

- Correlation reports analyze how ratings or scores correlate with their historical values across time, to ensure there are no sudden or unexplained spikes or dips in ratings. Most of those significant deltas will be correct and driven by specific events, but the ESG Research and Data team engages with the vendors to validate those results and to make sure no errors are plaguing the dataset.

- Coverage reports analyze how coverage for each metric and indicator has changed over time. In particular, this report evaluates various universes and lists of index constituents to make sure there is no sudden drop in coverage. Drops in coverage could be warranted (for example, the provider might be slowly discontinuing the use of a metric to replace it with a different indicator). Still, if any noticeable drop in coverage happens, the ESG Research and Data team engages with the vendors to inquire about the reasoning behind those changes and to make sure the data being leveraged is correct and sound.

Additionally, each month, the ESG Research and Data team calculates the number of issuers with significant standard deviation changes. These reports are essential in identifying any potential data issue, and reporting those issues (and their resolutions) to the MRM team. Any breaches that break the boundaries or thresholds agreed on with the MRM team are investigated by the firm's internal teams and reported to the external vendors' data teams. External vendors either confirm the results or provide correct data feeds to replace the erroneous files.

8 Systems and Downstream Delivery of Data

All applications and software, including client reporting systems, FactSet portfolio analysis reports, and portfolio management, risk, and compliance tools, receive information sourced from the ESG data views in the firm's production database. All information is fed downstream to make sure that all data and results are consistent throughout the firm.

IT personnel share ready-made extracts with the required data on a recurring, fixed basis (usually once a month, as soon as the periodic data is checked out) with team subgroups, including Portfolio Construction, Risk Client Reporting, Compliance, and other relevant internal teams, who upload that particular information to the necessary software or tool.

The organization has also prioritized the delivery, distribution, and use of standardized ESG data, and has funded several ESG data rationalization workstreams.

9 Conclusion

State Street Global Advisors is aware of the importance of leveraging reliable and trustworthy data for any investable purpose, from powering quantitative strategies, to displaying results in a client or regulatory report, to informing conversations with companies and clients (see The ESG Data Challenge). As a result, State Street Global Advisors has built robust processes and systems to help ensure that all ESG data and information used by the firm is sound, validated, consistent, and standardized.

Endnote

1 The firm's discretionary portfolios includes accounts managed by SSGA Funds Management, Inc. and any other State Street Global Advisors affiliate for whom State Street Global Advisors votes proxies pursuant to SSGA's Voting and Engagement Policy.

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Our clients are the world's governments, institutions and financial advisors. To help them achieve their financial goals we live our guiding principles each and every day:

- Start with rigor
- Build from breadth
- Invest as stewards
- Invent the future

For four decades, these principles have helped us be the quiet power in a tumultuous investing world. Helping millions of people secure their financial futures. This takes each of our employees in 29 offices around the world, and a firm-wide conviction that we can always do it better. As a result, we are the world's fourth-largest asset manager* with US $3.8 trillion† under our care.

* Pensions & Investments Research Center, as of December 31, 2022.
† This figure is presented as of June 30, 2023 and includes approximately $63 billion USD of assets with respect to SPDR products for which State Street Global Advisors Funds Distributors, LLC (SSGA FD) acts solely as the marketing agent. SSGA FD and State Street Global Advisors are affiliated. Please note all AUM is unaudited.

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