A Bloomberg Professional Services Offering

Bloomberg Terminal

ESG

Governance Scores

Methodology and Field Information

Bloomberg

Contents

Version Release Date	Description
April 2022	Methodology for Governance Scores

Introduction

Environmental, social, and governance (ESG) data has become essential for financial decision making — the 2008 financial crisis and numerous accounting scandals have resulted in an increased focus on the role of corporate governance in providing proper leadership and oversight and aligning corporate strategy with all relevant stakeholders.

As Bloomberg L.P. founder Mike Bloomberg is fond of saying: “If you can’t measure it, you can’t manage it.” In that spirit, we will demonstrate that gaining an understanding of the dynamics of corporate governance by using quantitative data and scoring can help investors in identifying both governance risks and opportunities.

Approach to Bloomberg Corporate Governance Scores

As part of Governance scoring, Bloomberg L.P. has developed Governance scores for approximately 5,500 global companies across all sectors and regions that are part of the Bloomberg ESG Score Universe (BESGSCO Index).

Combining data from the Bloomberg Terminal® with insights from Bloomberg Intelligence (BI) and Bloomberg Law, Bloomberg Governance scores offer quantitative, transparent analyses. Under the Governance pillar, the themes of Board Composition, Executive Compensation, Shareholder Rights, and Audit touch on a number of core ESG Issues that can have material impact on company performance, as research shows. These Issues can be further divided into a set of distinct sub-issues, leading to a clear taxonomy for data fields. In the analytical process, the Fields, Sub-Issues, and Issues all contribute to individual Theme scores, and ultimately a Governance score. Board Composition, Executive Compensation, and Shareholder Rights Theme scores are currently available to Bloomberg users, with Audit planned for future release.

The Themes, Issues, Sub-Issues, and Fields that make up Governance scores can be accessed and analyzed on the Bloomberg Terminal from BI ESG <GO>, under the ESG Scores section, or by using the Bloomberg ESG Disclosure Tracker at BESG <GO>, under ESG Data.

Score Framework and Structure

Themes, Issues, and Sub-Issues

To see a list of the specific fields for each Sub-Issue, please refer to the Governance Scores Theme Guides.

BOARD COMPOSITION

Director Roles	Diversity	Independence	Refreshment
CEO Roles	Age Diversity	Board Leadership Independence	Board Refreshment
Chair Roles	Gender Diversity	Board Independence	Chair Refreshment
Board Roles			

EXECUTIVE COMPENSATION

Incentive Structure	Pay Governance	Pay for Performance
CEO Incentive Plan Design	Compensation Board Oversight	Fixed Pay Alignment
Executive Incentive Plan Design	Gender Diversity	Variable Pay Performance
Executive Pay Equity	Say on Pay	
Executive Pay Linkages	Pay Policies	

SHAREHOLDER RIGHTS

Shareholder Policies	Director Voting
Takeover Defense	Director Terms
Voting Rights	Director Support
Director Election Policies	

Research and Analysis

Bloomberg's quantitative, transparent Governance score model has been designed by subject matter experts across Bloomberg and is powered by our management and board-level data, which are industry leaders in the data universe. In general, these scores are determined by Bloomberg's proprietary research and through guidance provided by third-party corporate governance frameworks and practitioners.

Key Bloomberg Contributors	
Bloomberg Intelligence	Bloomberg Sustainable Finance Solutions
Global Data	Quantitative Research
Index Research	Bloomberg Industry Group
Corporate Governance Frameworks	
The Investor Stewardship Group	The Organisation for Economic Co-operation and Development
International Corporate Governance Network	Council of Institutional Investors
Corporate Governance Codes	Local Listing Rules

Data Collection

To ensure accuracy and consistency, Bloomberg captures data from company-produced reporting in the public domain. This information includes annual filings, proxy statements, corporate governance reports, supplemental releases, and content gleaned from company websites and news sources, and is used for the profiles-based fields. Bloomberg runs sophisticated, multi-layer quality control systems to ensure that our data conforms to the highest standards. In addition, we ensure that only comparable data is included in the product by employing analyst reviews in the initial assessment of the disclosures and in secondary validations, along with statistical and heuristic analyses.

Raw data and scores fields used in Bloomberg Governance Scores are available on the Terminal via ESGD <GO>. Fields for the Governance scores rely on information from profiles-based, company-based, and proxy filing datasets. Profiles-based fields are updated near to real-time and are derived from the underlying data linked to an executive or director's individual profile on the Bloomberg Terminal (BIO <GO>), which is then aggregated at the company level for the field. The field IDs for the profile-based data begin with CG followed by a 3-digit identifier (e.g., CG600). Transparency information for data such as age, gender, tenure, and board roles is linked to each profile and can be found on the Terminal via MGMT <GO>. Company-based fields are updated annually, aligned to a company's fiscal year-end, and captured as reported by the company. The field IDs for the company-based data begin with ES followed by a 3-digit identifier (e.g., ES061). The company-based data and full document transparency is available on the Terminal via FA ESG <GO>. Proxy filing data is captured from annual general meeting disclosures such as meeting notices, proxy statements, and vote result documents. The fields used for scores will focus on the support values received by management nominees at that fiscal year's subsequent annual general meeting. Fiscal year assignment will be based on the most recently completed fiscal year referenced in the annual reports and compensation plans approved by shareholders at that annual general meeting.

The data collection methods for the profiles-based and company-based datasets may result in different outputs for similar fields at a specific point in time. For example, the profile-based CG field will report the latest available information on a company's board composition, whereas the company-based field will display the last known fiscal-year-end-aligned data. As such, the fields would not necessarily represent the same board composition, e.g., in the case of mid-year board composition change announcements. Reporting lags from the effective dates and the disclosed announcements will also factor into board composition data alignment.

Specific field outputs are not available for companies that do not disclose the required information on a company or individual basis. Fields dependent on the aggregation of profile-based data will return N/A if at least one individual is missing a required disclosure. For example, the number of female board members will not populate if the genders of all board members are not disclosed.

Scoring Methodology

Bloomberg's approach to scoring Corporate Governance performance is characterized by a bottom-up, model-driven method. It is driven primarily by self-reported, publicly available information that results in a fully transparent, parametric, rules-based scoring framework. It features:

- Qualitative input from research analysts and subject-matter experts for identifying appropriate fields and metrics, as well as their relevance to specific issues and markets.
- Statistical techniques to score fields based on Corporate Governance guidelines and fundamental research, when applicable.
- Parametric methods that closely approximates the empirical distribution of quantitative fields with historical data are used, accounting for differences across industries and countries, as well as different corporate governance state, to facilitate meaningful comparison between companies.
- Factor analysis to aid in identifying unique Issues and Sub-Issues.

The following sections detail the technical protocols for generating Governance scores that were followed for companies in the Bloomberg ESG Score Universe. Estimation of firm age and the approach to field pre-processing are described below. Field-level scoring approaches are illustrated in the next section, followed by weighting and aggregation decisions.

Firm Age Estimate

Several Issues within Governance require an estimate of firm age in order to determine the field applicability for young companies. This is designed to avoid overly penalizing young companies for failing to adopt best practices that are more commonly found in mature firms. For example, young firms are unable to "refresh" the board in the same way that a long-established firm can do so.

Firm age as of each year-end date is calculated using Field INTERVAL_START_VALUE_DATE (PY023), which denotes when a security began trading. This methodology is only a proxy for firm age because this calculation can be affected by various corporate actions. As an example, a spin-off may carry board members over from the previous corporate entity. Likewise, firms may exist as private companies for several years before their securities start trading publicly. Note that in practice, a firm could be older than this "age" calculation, but it is unlikely to be younger than the estimate.

Field Pre-processing

Most field-level scores are calculated by using corporate governance fields as direct inputs. Certain fields, however, require pre-processing or transforming the raw corporate governance data fields to facilitate meaningful comparisons across companies. In some cases, corporate governance fields were transformed to derive new fields. For example, Age Diversity scores are computed based on an "adjusted age range" by taking, as a maximum, 75 for the oldest director's age, less the youngest director's age. This formula caps the reward for a wide age range by using the most commonly adopted retirement age. For Executive Pay Equity, CEO pay is subtracted from total executive pay, in order to calculate a pay equity ratio. In the Shareholder Rights Theme, for some companies, shareholders do not vote on directors every fiscal year (due to reasons like a classified board structure), A carry-forward calculation is applied to get the latest director vote result data available. Therefore, the derived field values, instead of the original input field, is scored.

Field Scoring

In general, field scoring is determined from guidance provided by Bloomberg research on best practices, corporate governance frameworks, and industry practitioners. Typically, the guidance takes the form of a best or worst

governance practice. Categories are mapped to numerical values, so that best practices attain a score of 7 and up and worst practices attain scores of 3 and below, with significant ground in between.

Tables summarizing how fields within different Themes are scored and details about field-level scoring, including the graphs of field scoring curves are available in the individual Governance Scores Theme Guides.

Scoring Curves

Where quantitative guidance is available, the current version of the Governance scores attempts to integrate meaningful thresholds as anchor points for scores. In practice, guidance from external research and analyst judgment are regularly used to set a range of "anchor points" through which we specify scoring curves. most of the field-level scores are calculated this way. See the individual Governance Scores Theme Guides for a full list of related scoring curves.

Smooth Curve

Scoring curves are specific types of interpolations.

[1] between anchoring points that are determined based on corporate governance guidance. Across the entire scores process, Bloomberg has regularly used external research and analyst judgment to set a range of parameters through fine-tuning the curves by dropping "anchors" in benchmark scoring curves.

Figure 1 shows an example for scoring the Percentage of Women on Board (CG627). A company where the board composition by gender is 30% women receives a score of 5; with 40%, it receives a score of 8. Once the board composition reaches 50%, the score rises to 10.

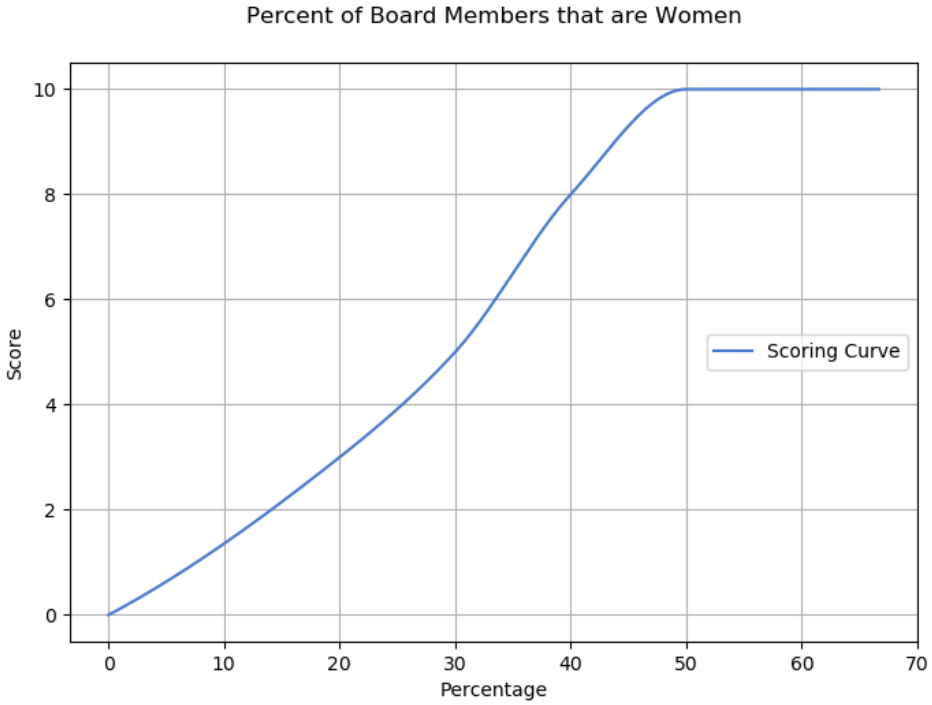

Figure 1 Scoring Curve on Field "Percent of Board Members that are Women"

For certain fields, the age of the firm is also considered, in order to avoid penalizing a young company. For example, Chairman Tenure (CG690) combined with the estimated Firm Age is used to compute scores for the Chairman Tenure field group within the Refreshment Issue of Board Composition. The score takes Firm Age into consideration, so that a new firm (less than 3 years old) is not penalized for a short chairman tenure.

Scoring curve with contingency

Certain fields, such Board Duration (ES064) are scored with a contingency on the value of additional fields. In the context of director terms scoring, classified (staggered) boards and multi-year director terms are both discouraged, so the field Board Duration (ES064) is scored contingent on field Classified Board System (ES183). Different anchor points are used based on whether company has a classified board or not. In general, for the same board duration, companies with a classified board will receive a lower score compared to companies with a non-classified board.

Step Curve

Sometimes fields have discrete outcomes, i.e., they take a finite number of values. Since number of values is finite and usually countable, step functions[2] are used for scoring. Below is an example of step scores used in the Director Roles Issue on field CG651 – the Number of Board Positions CEO Holds (at other firms). Scores are pre-specified for each discrete value based on anchor points and decrease abruptly from one constant value to another, as the number of board positions a CEO holds at other firms increases.

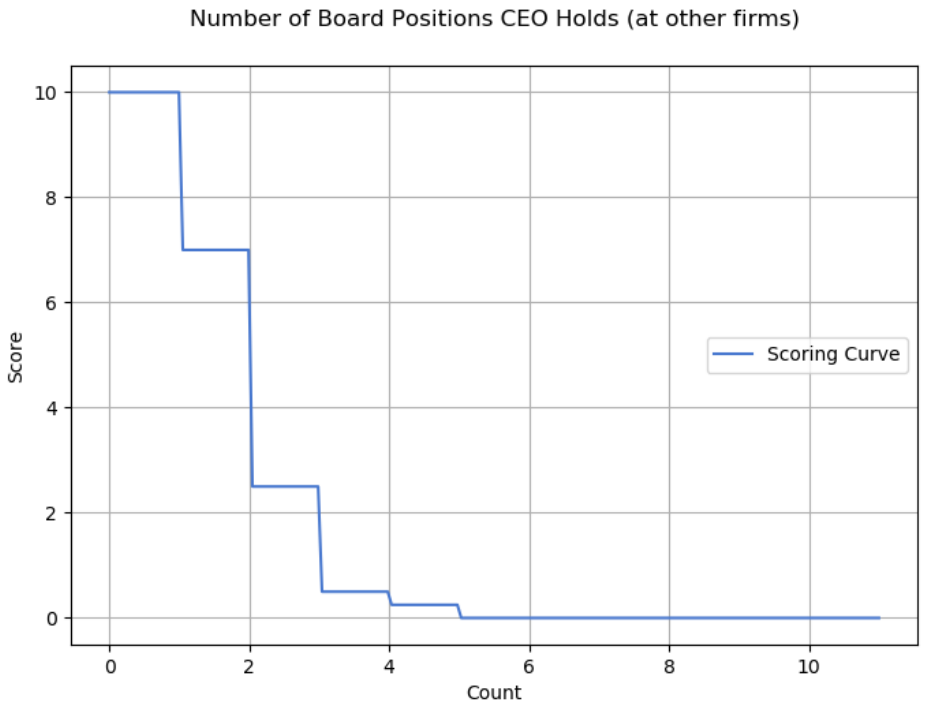

Figure 2 Scoring Curve on Field "Number of Board Positions CEO Holds (at other firms)"

Other Methods

Not all fields can be scored via a scoring curve, whether it would be a smooth curve or a steep curve. In addition, some fields are scored based on more than one field value as input.

Binary Fields

In cases where input fields are based on one or more binary field, an information lookup is utilized based on a defined set of outcomes.[3,4] For example, the Board Leadership Independence Score is based on the below combination of binary fields:

Case	Score
Separate CEO/Chair and independent Chair with or without independent Lead Director	10
Separate CEO/Chair with non-independent Chair and independent Lead Director	7
CEO duality (chair is the CEO) with independent Lead Director	5
Separate CEO/Chair with non-independent Chair and no independent Lead Director	3
CEO duality with no independent Lead Director	0

Balance Fields

The objective of these metrics is to identify how well-balanced values are between multiple fields, for example, board tenure "buckets" or cash vs. equity executive compensation.

Below is an example of Board Balance. The measurement of Board Balance is based on the board tenure state, which consists of three buckets that are calculated in the "Field Pre-Processing" step.

Based on research, optimally balanced board tenures would result in a distribution of [3/8, 3/8, 2/8], given the three buckets.[5] In analyzing various board tenure states to develop scores on board balance, the following scoring principles have been applied:

- If all of the board members are in the 10+ year tenure bucket (B3), the score is 0.
- If all of the board members are in the 5–10-year tenure bucket (B2), the score is 1.
- If all of the board members are in the 0–5-year tenure bucket (B1), the score is 2.
- Given the board size, the bucket state that is closest to the target distribution of [3/8, 3/8, 2/8] should get a score of 10.
- The Number of steps is an integer that represents the minimum distance to the optimal state. Thus, if the partition is optimal relative to the desired distribution, steps=0. Otherwise, the steps are greater than 0. Scores should reflect the Number of steps in rank order (longer distance results in lower scores).
- Score increments should vary smoothly, i.e., each "transition" would ideally result in the same score increment.

The scores are calibrated based on those principles using mathematical tools (a Quadratic Programming Solver[6]). Consider an example of board balance scores for a board with 8 directors in total. Based on the definition of perfectly balanced board tenures, the number of directors in each bucket, given the board size: 3, 3, with 2 in the last bucket. In the ternary figure, each node represents a board tenure state, with the three numbers following the node, from left to right, representing number of directors in the 0–5-year tenure bucket, the 5–10-year tenure bucket, and the 10+ year tenure bucket. Scores are calibrated and displayed above each tenure state.

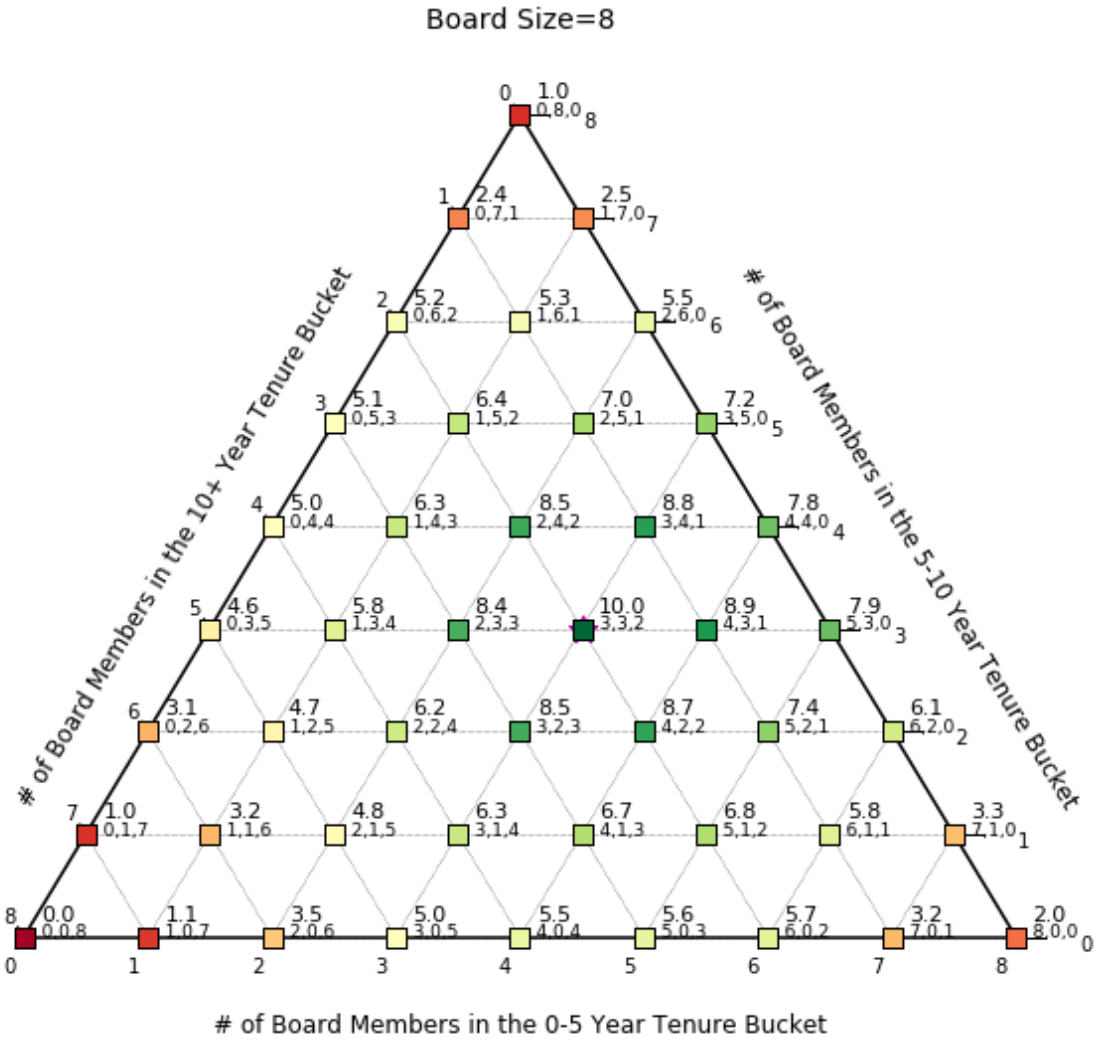

Figure 3 Board Balance Score

Dark green represents the optimal balance between tenure buckets, and dark red represents a complete lack of balance.

Size Dependent Fields

Similar to the Board Balance scoring methodology, these fields leverage more than one input field to obtain the score (board or committee size is considered in addition to the underlying numbers). Scores are calibrated by leveraging mathematical tools based on principles determined from Bloomberg analyses of numerous corporate governance codes around the world.

A sample[7] of scores on the number of independent directors vs. total number of directors is shown below; these calculations are based on a defined set of outcomes, given the number of independent directors on board (lookup by row) and total number of directors on board (lookup by column). Scores for different states are highlighted with different colors to help distinguish good and bad practices.

Number of Independent Directors	Total Number of Directors on Board									
	3	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
0	0	0	0	0	0	0	0	0	0	0
1	3	1.78	1.37	1.14	0.95	0.77	0.67	0.6	0.51	0.47
2	7	3.72	2.95	2.47	2.08	1.76	1.55	1.36	1.23	1.13
3	10	7	4.5	3.71	3.22	2.77	2.4	2.19	1.97	1.81
4		10	7.5	5	4.3	3.69	3.33	2.93	2.67	2.38
5			10	8	5.9	4.74	4.16	3.76	3.4	3.11
6				10	9	6.92	5	4.56	4.09	3.65
7					10	10	7.64	5.6	4.82	4.4
8						10	10	8.12	6.32	5
9							10	10	8.61	6.86
10								10	10	9.03
11									10	10
12										10

Figure 4 Independent Director Score

Dark green represents the best practice of independent directors on board, and dark red represents a complete lack of independent directors on the board.

Parametric Approach in Pay for Performance

Unlike many other Governance fields that are scored based on scoring curves or a scoring matrix constructed using anchor points that reflects views from fundamental research, there is no well-established consensus formula or anchor points that indicate what fair value is for a particular executive's compensation. Accordingly, we have developed an empirical approach to evaluate Pay for Performance using disclosed executive compensation data. See Section Field Scoring - Parametric Approach in Pay for Performance in Governance – Executive Compensation Scoring Methodology for details.

Aggregation

Overview

Scores on each level (Field, Sub-Issue, Issue, and Theme) roll into a higher level of aggregation: Fields are scored individually and rolled up into Sub-Issues, which then feed into the major Issues, which, in turn, are folded into the four Theme scores of the Governance Pillar score In general, Bloomberg's proprietary approach toward aggregation attempts to reward consistent performance and penalize uneven performance.

Sub-Issue Scores

There are several different ways to aggregate field-level scores into Sub-Issue scores: a weighted generalized mean (p-mean); a simple mean (average); and some special cases using custom aggregation as introduced below.

P-mean is used to reward general excellence and to penalize less consistent performance between the various Sub-Issues being aggregated. As with all Bloomberg ESG Sub-Issue scores, we use weighted shifted p-means, with the power p=0.5 and shift s=1.[8]

$$M(x,w,p,s) = \left(\sum_{j=1}^{n} w_j\left(x_j + s\right)^p\right)^{1/p} - s$$

Simple Mean is used when fields within one Sub-Issue are compensable with one another (i.e., good performance in one field can compensate for bad performance in a related field) and there are high correlations between the field-level scores.

Bonus Field is applied to specific Sub-Issues. For example, Gender Diversity is a function of the gender makeup of the board, with a potential uplift for a woman Chair.

The field CHAIRMAN_OR_EQUIVALENT_A_WOMAN (CG629) serves as a bonus field, adding 1 point of credit to the overall Gender Diversity score. Sub-Issue scores are always capped at 10. The aggregation formula[9] is:

Gender Diversity Score = "minimum(10,% of Board Members that are Women-S + 0.1*Chairman or Equivalent a Woman-S)"

Where '-S' represents the score of the input field.

"Deflator" is a way to aggregate scores by proportionally scaling the aggregated scores based on a field (score) within the Sub-Issue. For example, In the Say on Pay Sub-Issue, two Field Scores (Say on Pay Support Level and Frequency of Say on Pay Votes) are multiplied to generate the Sub-Issue score, as shown below:

$$Say\ On\ Pay\ Sub\text{-}Issue\ Score\ =\ Say\ on\ Pay\ Support\ Level\ Score\ *\ Frequency\ of\ Say\ on\ Pay\ Votes\ Score/10.0$$

A company can have a score of 10 on Say on Pay Support Level field, but the Say on Pay Sub-Issue Score is 7 if the company set the frequency of say-on-pay every three years.[1]

Effectively, the Frequency of Say on Pay Votes Field Score serves as a "deflator" that caps the Sub-Issue Score to be lower than 10 if the frequency of the say-on-pay vote is less frequent than every year.[2]

---

[1] See the Say on Pay Categorical Scoring table introduced in the Field Scoring section, in Executive Compensation Scoring Methodology Guide.
[2] It is a best practice for companies to hold a say on pay vote annually, though in some markets a less frequent vote may be allowed.

Score aggregations for each Sub-Issue are detailed in the specific Governance Scores Theme Guides.

Issue Scores and Theme Score

Values are aggregated using weighted shifted p-means to reward general excellence and penalize less consistent performance between the key Issues and Sub-Issues. Factors such as firm age, board size, board structure, and country of issue are also considered.

- Issue scores are a function of the weighted generalized mean (p-mean) of the Sub-Issue scores, with weights decided within each Issue, as described in the individual Governance Scores Theme Guides.[10]
- Theme scores are a function of the weighted generalized mean (p-mean) of the Issue scores. The weighting scheme for each Theme is determined based on fundamental research and company-specific factors, such as firm age or local market rules.

Governance Pillar Score

Provisional Governance Pillar Score As Bloomberg continues to develop all four themes (Board Composition, Executive Compensation, Shareholder Rights, and Audit) that will make up the Governance Pillar Score, we have developed a methodology to aggregate existing Theme Scores (currently Board Composition, Executive Compensation, and Shareholder Rights) into a Provisional Governance Pillar Score.

The Pillar Score is a weighted generalized mean (p-mean) of existing Theme Scores, where the weights are determined by the Theme Priority rankings using a transformation function. The values of the power and shift (p=0.5 and s=1) are the same as they are in the calculation of Issue scores.

Theme Priorities Themes included in the Provisional Score are weighted based on Theme Priority. Bloomberg Intelligence conducted an assessment of corporate governance issues, prioritizing and ranking themes using proprietary and external sources, which reflects the following inputs:

- Internal discussions and interviews with Bloomberg Intelligence analysts.
- Analysis and news by Bloomberg Intelligence and Bloomberg Law and Government that highlight financial impacts related to key governance risks (e.g., litigation, fines, shareholder actions, employee turnover).
- Bloomberg analyses of numerous corporate governance codes from different countries.
- Academic/scientific studies that point to the highlighted factors.

BI Theme Priority rankings are assigned weights ($\tilde{w}$) that are determined as a function of a ranking (k) of their relative importance.

$$\tilde{w} = 1 + e^{0.5 \times (3 - k)}$$

Note that the weights do not decrease in a linear fashion by design.[3] This reflects the relatively high importance of the top rankings and implies that lower priority Issues have a lesser effect on Pillar Scores.

After the calculation of absolute weights for each Theme, the weights are divided by total weights of all Themes to derive the relative weights, which feed into the weighted p-mean aggregation to calculate Governance Pillar Score.

[3] 0.5 and 3 are the values of the tuning parameters in this equation, the former controls the ratio of weights between adjacent ranks and the value of 3 controls where it starts to flatten in those ratios. The values are calibrated to meet the scores design principle.

Heat Map of Governance Themes and Priorities

Provisional Governance Score	BI Theme Priority Rank	Weighting Points	Theme Weight
Board Composition	1	3.72	41.24%
Executive Compensation	2	2.65	29.38%
Shareholder Rights	2	2.65	29.38%
Total Points		9.02	100%

Dark green represents the highest priority and light green represents the lowest priority.

Conditional Field Scoring and Aggregation

When it comes to evaluation of a public company's corporate governance policies and performance, field-level applicability and further applicability of Sub-Issue(s) should be considered, due to the nature of variation of a company's corporate structure, local market rules, and reporting requirements to avoid unreasonable scoring and aggregation on non-applicable input fields. Custom field-level scoring and aggregation on each level are incorporated and implemented to handle different conditions. See the Governance Scores Theme Guides for individual cases.

Endnotes

1 Cubic Spline interpolation is a special case of Spline interpolation, which is a form of interpolation where the interpolant is a special type of piecewise polynomial called a Spline. This method gives an interpolating polynomial that is smoother and has a smaller error than some other types of interpolating polynomials.

2 A step function is a piecewise constant function, with only finitely many pieces and with constant values within each interval.

3 The rationale for scores of each case can be found in the Research and Analysis section of each Governance Theme Guide.

4 If any input field value is missing, the company receives the lowest score among all possible scenarios.

5 The rationale for optimal tenure buckets distribution can be found under Research and Analysis, in the Independence Issue section.

6 Quadratic programming (QP) is a particular type of nonlinear programming focused on the process of solving a special type of mathematical optimization problem — specifically, a linearly constrained) quadratic optimization problem.

7 Full scores tables are available in Appendix C.

8 The p-value of 0.5 is chosen as the midpoint of the values that represent an arithmetic mean (p=1) and a geometric mean (p=0). The shift value s=1 is chosen to avoid large penalties for scores near 0.

9 The presence of a chairperson may not always be relevant, as some companies have no established chairperson on the board. This is illustrated in the Conditional Field Scoring and Aggregation section.

10 Weights between Sub-Issues are determined by a quantitative review of data, combined with a qualitative review of the research, as discussed in the Research and Analysis section.