



FACT SHEET

Entities Covered	Company, Directors
Coverage Universe	Companies (9,500+) Directorships (220,000+ active and historical) Base Director Performance (220,000+ active and historical) Director Interlocks (2+ million edges active and historical)
Historical Data	9,500 company directorships (2020-present) 3,000 company directorships (US only); (2017-present) Director interlocks (2000-present)
Data Sourcing	Free Float Analytics (~40% KPIs) MSCI ESG Research (~30% KPIs) ESGauge (~15% KPIs) Other Third Party (~15% KPIs)
KPI Generation	<p>Director KPIs: Age, Tenure, Gender, Education, Compensation, Director influence (current), EBITDA batting average (5yr), TSR batting average (5yr), Carbon Intensity batting average (5yr), Controversies batting average (5yr), Overall batting average (5yr), Second Degree Connections on Board, Percentage of Board Connected To, Second Degree “Loops”, Influence Drivers (School, Degree, is/was CEO, Board Roles, Connection driver, Structural driver), Director Skills Exposure, Director Eigenvector, Director Communities (modularity), Director Centralities, Expanded Performance (see appendix), Diversity Data (via third party)</p> <p>Company KPIs: Team EBITDA batting average (5yr), Team TSR batting average (5yr), Team Carbon Intensity batting average (5yr), Team Controversies batting average (5yr), Team Overall batting average (5yr), Gender Power Gap, Percentage of Board Connected Inside Two Degrees, Influence of Connected Directors, Board Typing, Influence Consolidations by Cohort, Director Community Exposure, Political Leans (S&P500 only), Industry Skill Exposure, Diversity Exposure (via third party)</p>
Update cycle	Monthly (directorships), Quarterly or Annual (performance)
Delivery	Web platform, API, flat file

Free Float, LLC is a West Hartford, CT based company whose founders have a combined 25+ years of environmental, social, and governance analytics experience. For more information, visit www.freefloat.llc or contact inquires@freefloat.llc.



FREE FLOAT ANALYTICS™

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INTRODUCTION

Consider that, on average:

- Board candidates receive 96% support globally¹ from investors
- Director support is highly correlated solely with stock price²
- Director tenure globally is around 7 years³
- Directors are white, male, and aged 64 years old⁴
- Annually, there are nearly 90,000 directors up for election investors must assess⁵

Academic⁶ research⁷ suggests⁸ successful engagement with companies and their directors results in better returns, a higher focus on sustainability and ESG, and more efficient operations. However, the scale of the engagement problem is simple - there are more than 10 times as many directors as companies, and investors almost universally default to a “trust in management” position in selecting the people that will steward investor capital. Management, historically, has chosen individuals who resemble themselves⁹, even when tasked with searching for “independent” candidates. This acts as a means of consolidating power with management itself. The result is a global directorship that is largely white, male, old, and entrenched. That power dynamic is self-perpetuating, and there’s evidence from primate research that shows less influential (“beta”) members of a group will defer to the “alpha” even if there is cost to themselves.¹⁰

The real life case study of this behavior that inspired Free Float Analytics™ is the Boeing board in 2011. Following the Boeing MAX 8 crashes in 2018 and 2019, authorities implicated Boeing, including the board, in the crashes¹¹, and while Boeing’s CEO and board would ultimately go on to see turnover and pay liability costs, we began a research project to determine how this board was constructed in the first place. The results were surprising, even to long-time ESG and governance experts: the board members present in 2011 that green lit the MAX 8 designs were composed almost entirely of clients of Duberstein Group, the lobbying firm run by the Head of the Nominating Committee, Ken Duberstein. This was true not just in 2011, but for a period

¹ MSCI ESG Research data

² <https://www.sciencedirect.com/science/article/abs/pii/S0165410109000470>

³ MSCI ESG Research data

⁴ MSCI ESG Research data

⁵ MSCI ESG Research data

⁶ https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2154724

⁷

<https://ecgi.global/sites/default/files/Paper%3A%20The%20Real%20Effects%20of%20Institutional%20Investor%20Engagement.pdf>

⁸ <https://link.springer.com/article/10.1007/s10551-021-04850-z>

⁹ <https://www.tandfonline.com/doi/abs/10.1080/09585192.2018.1496126>

¹⁰ <https://www.sciencedirect.com/science/article/pii/S0960982208014176>

¹¹ <https://www.bloomberg.com/news/articles/2020-03-06/house-panel-blasts-boeing-faa-for-roles-in-flawed-737-max>



between 2000 and 2019, when Duberstein left the board. For nearly a 20 year period, Boeing's board was assembled such that two or three individuals commanded the entirety of the board through interlocks, existing client relationships, and social dynamics. Boeing's boards in this period averaged 95% investor approval.

Investors only demanded restitution after Boeing's oversight failure cost lives (and shareholder capital) - they only wanted to know "who is responsible" after a disaster. There are often social reasons¹³ for this¹⁴ as investors fear reprisal from management or peers for taking antagonistic positions. Free Float Analytics™, then, is meant to serve a simple purpose: arm investors with data on the stewards of their capital. How are the directors in a portfolio chosen? How do they interact - how much influence does any individual have in decision making? How do they perform? Free Float Analytics™ is designed to answer these questions using a data-driven approach to identify who is an outlier and could be engaged and how a people-first approach to investing could change allocation, price, and stewardship decisions.

ABOUT SPORTS ANALYTICS

Sports analytics in the form of "sabermetrics", a term used to describe baseball analysis, were popularized by Bill James, a baseball fan and statistician who introduced advanced metrics into the measurement of baseball team and player performance. At its core, it's a way to describe the real world performance of teams in the zero sum world of sports. The simplicity of "sabermetrics" as a concept has seen it spread widely across sports, with teams in various leagues using data and statistical models to describe how players perform within teams and throughout careers. We use the term here as a nod to the fact that boards of directors are, in effect, teams, and similar approaches can be used to understand them. However, overseeing a publicly traded company is not a head-to-head zero-sum game as it is in sports. We leverage concepts drawn from sports analytics (such as "win shares" and adjusted "batting averages") built from a broad array of sociological and behavioral theory, social network theory, and board behavioral research to generate assessments of individual directors' influence and performance across companies and careers. **Think of it as moneyball for directors.**

¹² <https://www.sciencedirect.com/science/article/abs/pii/S0304405X10000693>

¹³ https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2447012

¹⁴

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2238999#:~:text=Analyzing%20shareholder%20votes%20on%20the,to%20capture%20a%20causal%20effect.



DATA SOURCES

To build Free Float Analytics, we currently use data collected by Free Float, LLC as well as source a number of ESG and non-ESG data from the following third-party sources, including:

- Free Float Analytics sourced
 - Individual director data
 - Connections database
 - Social networking
 - Biographical data
- MSCI ESG Research
 - Individual director data
 - ESG performance data
- ESGauge
 - Director committee data
- Other third parties
 - Individual director data
 - Diversity data
 - Traditional financial performance data

Roughly 60% of our data is drawn from multiple third party sources, with 40% generated or captured directly by Free Float, LLC.

DATA PROCESSING

Data ingested from third-party sources are reviewed and matched to the Free Float database of board members. Data is pulled via API, platform, or flat file. Free Float assigns its own person identification numbers to each director and uses a variety of company identifiers and third-party board member identifiers to avoid duplications. The data is also reviewed for quality in samples across regions, company sizes, and industries. We keep updated error files on each of our providers to speed and scale our QA processes using pattern recognition.

While Free Float, LLC routinely reviews and makes best efforts to verify or complete third-party, we are not responsible for its overall accuracy, quality, or completeness and are held harmless and indemnified against errors, omissions, or misrepresentations of third-party data.



FREE FLOAT ANALYTICS™ CORE ASSESSMENTS

Our core metrics fall under two categories: *Influence* and *Performance*.

MEASURING DIRECTOR INFLUENCE: OVERVIEW

Influence represents an estimate of how influential a given director on a given company in a given year may be in board-level group decisions. We generate a number in the form of a percentage to represent the percentage of influence and responsibility a given board member may have in decision making - we will refer to it as the Influence Factor or just as Influence. Influence Factors combine more than 100 metrics, which we group in the following subfactors:

- Resume influence
 - Indicators include whether directors have prior experience on boards of larger companies, whether they attended elite schools, whether they have advanced degrees, and other prior work experience.
- Network influence
 - Indicators include how interconnected they are with other board members and whether they are a demographic outlier on the board, such as youngest, oldest, or the only director of diverse representation.
- Status influence
 - Indicators include insider status, shareholdings, tenure, and whether the member was placed by an activist.
- Role Influence
 - Indicators include structural roles across the board, such as CEO, Founder, Chair, Lead Independent Directors, Committee membership, or other significant roles.

Influence Factor is shown as a percentage for each director on each board. For instance, if “Director Y” is on “Company X” in 2022 and has an Influence Factor of 15%, that suggests that “Director Y” commands 15% of the overall boardroom influence in that year. We also produce percentages that show how much of a director’s influence comes from a particular subfactor. For instance, if “Director Y” has a Resume Factor of 20%, that means our data suggests that 20% of “Director Y”’s final Influence Factor is derived from factors related to his/her/their resume. For specific details on how Influence Factors are generated from the KPIs and subfactors, a methodology detailing the concept of “win shares” is below.



MEASURING DIRECTOR INFLUENCE: ALGORITHMS

Influence Factors are generated using the sabermetric concept of “win shares.” Bill James used formulas to effectively assign how many “wins” an individual athlete on a team worth in a given year. In our variation, we are estimated whether a particular attribute generates a “win” over the other directors on the board in terms of influencing behavior. Consider a given board of directors has a set number each year, either per the bylaws or per occupation of the positions as elected. Each director has a set of attributes, including their background, role, and relationship to the company and the other board members. Those attributes can be considered, in the context of a particular board, a “win” over other board members (as in, an attribute that is *likely* to have meaningful impact on a director’s influence over the other board members) or a “null value” (as in, an attribute that has limited or no impact on a director’s influence over other board members). The subfactors and data points used to determine influence were drawn from a deep set of academic and practitioner research, a list of which can be found in the reference bibliography at the end of this document.

In order to calculate “wins”, we use two methods - *contextual* wins (a “win” relative to what we would expect at a similar company) and *hierarchical* wins (a “win” that is related to a particular role or value the director has in relation to their specific company).

Contextual “Win Shares”

By using a global set of expectations and our assessment of which attributes are greater contributors or inhibitors of influence, we can estimate how “extraordinary” a board member may be for a particular attribute. For instance, we calculated that 31% of the average mid-cap US-based company board in 2022 have been CEOs before. If Company X was a US-based mid-cap company in 2022 with a 10-person board, the “expected” number of ex-CEOs on Company X’s board would be three. So we would expect that those three directors would “beat” the other seven on this particular KPI, splitting seven “wins” amongst them, resulting in 2.3 “wins” each. The formula to calculate those wins would be as follows:

Figure 1: Contextual win share equation

$inf_r = \frac{\beta - \beta \times \frac{\sum y_{i,g}}{\beta_{i,g}}}{\gamma}$	<p>inf_r : influence deriving from a director’s resume KPI β : number of directors γ : number of directors meeting a specific criterion</p>
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However, for the sake of the case study, let’s assume Company X’s board actually has five members who have prior CEO experience. In which case, the seven expected “wins” would be split amongst five members instead of three, representing the fact that being an ex-CEO is less differentiating than it would be at your average US-based mid-cap company. So each director



that was a CEO would receive 1.4 wins rather than the expected 2.3 wins. We used context-based “win share” calculations for each of the Resume influence factors.

The full list of KPIs using context-based “win shares” are listed in Appendix A.

Ranked “Win Shares”

In contrast to contextual “wins” which base the value of the “win” on a comparison to an expected value relative to peers, ranked “wins” are designed to either be head-to-head within the company context or role-based by assigning a hierarchy based on the roles the director occupies inside the board.

For instance, Director Y may be a long-tenured director who’s acting on two committees (chair of the Audit committee equivalent and a member of the Compensation committee equivalent). For tenure, we would use a head-to-head approach with a threshold in which Director Y’s tenure is compared to the 90th percentile of all directors on the board. If Director Y is the only director above the 90th percentile, Director Y would be given nine “wins” (winning head-to-head against all directors on the board in that year). If another director also is the 90th percentile or above for tenure, Director Y and the other director would each get eight “wins” (winning against the remaining directors on the board for that year). KPIs for which head-to-head ranked “wins” with thresholds are applied are listed in full in Appendix A.

The second ranked “win” approach uses a hierarchy of roles on the board. We have developed a role tree which outlines which roles are *most likely* more influential relative to the other roles on the board. For instance, acting as board chair is *likely* embedded with more influence than serving as an Audit committee member. Certain roles are not granted by company by-laws, such as the role of “founder” or “family”, but where they exist, we consider them to be effectively a role with significant amounts of influence. Role-based “wins” cascade as a result of their structure and our assessment such that a chair will always generate more “wins” than the chair of a committee, which will always generate more “wins” than a committee member, and so on.

The hierarchical structure for ranked role “wins” are listed below, with the equation outlining the “win” cascade.



Figure 2: Ranked role win share equation

$$\varepsilon_{founder} \times 2\beta$$

$$\sum_{k=1}^n \varepsilon_k \times (\beta - H_{\beta,k})$$

- **Founder > ...**
- **CEO > ...**
- **Family > ...**
- **Chair > ...**
- **Former CEO > ...**
- **Executive Director > ...**
- **Lead Director > ...**
- **Pay Chair > ...**
- **Pay Member; Nominating Chair > ...**
- **Nominating Member; Audit Chair > ...**
- **Audit Member > ...**

Where:

β : number of directors (total count)

H : Roles hierarchy factor (number of wins is based on specific company board makeup):

ξ : Indicator binary

The complete list of ranked hierarchical wins are listed in the appendix.



Token Debts

There are instances, particularly historically or in certain jurisdictions, where “tokenism” is still prevalent. We define tokenism as the presence of a lone member of a board that is an outlier by:

- Age (young or old)
- Gender (female only)
- Race/ethnicity, where data is available (any)

When determining “wins” in these cases, we simply debit a single win from these directors to represent the *likelihood* that a token director has less influence. This reflects the academic research that suggests when diversity is lacking, individuals of a diverse nature tend to have less information¹⁵ and social import¹⁶ in the boardroom. For “token” directors with other sources of influence (for example, a board chair who is the lone woman or person of color on a board), the debit has little impact on the final Influence Factor.

Figure 3: Token debts for demographic outliers equation

$inf_s = \left\{ \begin{array}{l} -1, \gamma_s, \lambda_s = 1 \\ 0, \gamma_s, \lambda_s \neq 1 \end{array} \right\}$	<p>γ_s : number of directors meeting a specific criterion</p> <p>λ_s : number of remaining directors meeting a specific criterion</p>
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MEASURING DIRECTOR INFLUENCE: BOARD SOCIAL NETWORKS

While the individual KPIs for Resume, Status, and Role are listed in Appendix A, the Network subfactor includes a mapping of board social networks. We mapped more than 250,000 directors and 40,000 named executive officers globally over a 10 year period to each other through board and company interlocks and affiliations with major known organizations such as the Business Roundtable. The list of affiliations with historical data available is highly limited, but we’ve used both publicly available and private company or organization connections where feasible. While we’ve calculated a number of social network factors, for the purposes of the Network subfactor of the Influence Factor we narrowly focused on connection degrees. The shorthand here is, “how many phone calls might it take to go from Director Y to Director Z?”

Limitations aside, using the board interlock mapping, we identify board members who are connected to other board members *excluding* boards on which they sit together in two degrees

¹⁵ <https://link.springer.com/article/10.1007/s10997-010-9165-y>

¹⁶ <https://journals.aom.org/doi/abs/10.5465/amp.2015.0154>



or less (“a friend of a friend”). Given the breadth of director histories available, we have mapped several million discrete connections between board members. We include these connections as part of the Network Factor, we use a variation of the ranking methodology - “head-to-head” rankings - in which directors are ranked against other directors on the board, where each lower ranked director based on third degree connections gets one fewer win as shown in the equation below. In these cases, we are not “assigning” a hierarchy, the output is determined by a simple ranking of directors on the attribute on a head to head basis.

Figure 4: Social network wins equation

$$inf_w = \sum_{j=1}^n 1\{X_j \geq X_n\}$$

inf_w : influence from a director’s third degree network ties

X: director

j: top ranked director for third degree network ties

n: total directors on board

MEASURING DIRECTOR INFLUENCE: SPECIAL CASES (THE “CONSOLIDATED INFLUENCE” DIRECTORS)

A key problem we had to solve in developing the idea of influence was structural influence factors. For instance, a founder on the board who owns significant shares at a NON-controlled company is almost certainly in a position to wield outsized influence in the boardroom, much less if that founder holds a second class of shares that gives them outsized or majority voting power. In these cases, we’ve established a method to account for the fact that the influence of the outside or other directors on the board is vastly dwarfed by that of the founder or major shareholder. Effectively, we award these “special case” directors the “win value” of the board in its entirety - we create a virtual “second board” to ensure these directors receive the majority of influence. The equation used is below.



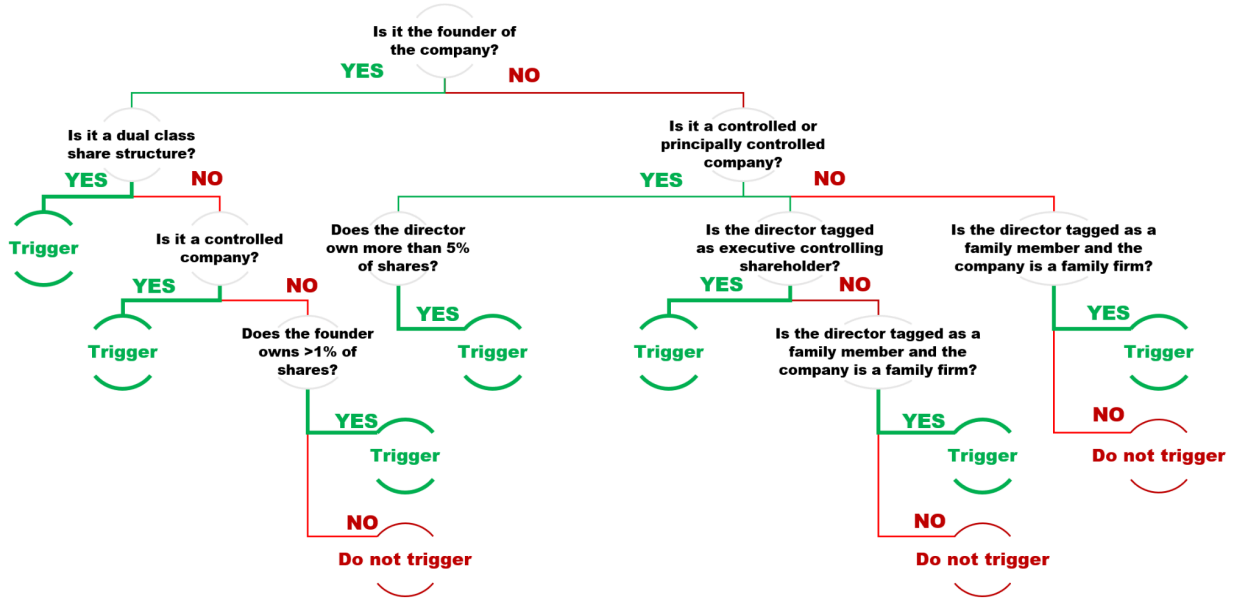
Figure 5: Special cases for “consolidated” influence

$inf_x = \frac{\sum inf_{l,t,w,r,s}}{\gamma} \times \xi_x$	<p>γ : number of directors meeting a specific criterion</p> <p>inf_l : influence from a director’s role on the board of directors (hierarchical wins)</p> <p>inf_t : influence from a director’s status score (ad hoc wins) - activist, special shareholder, tenure outlier, insider</p> <p>inf_w : influence from a director’s third degree network ties (competition wins, “1224”)</p> <p>inf_r : influence deriving from a director’s resume (context wins)</p> <p>inf_s : influence debit from a director’s social score (binary debits)</p> <p>ξ : Indicator binary</p>
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To identify those directors that qualify under these “special circumstances”, we use a simple decision tree that leverages both basic firm-level tags provided by third parties and individual characteristics of the director, such as shareholdings and family relationships. Where these special circumstances are met, the equation above is triggered for those individuals and they are awarded the majority share (or a shared majority) of board influence.



Figure 6: Trigger decision tree scenarios for “consolidated” influence



MEASURING DIRECTOR INFLUENCE: THE FINAL INFLUENCE FACTOR

When each factor is complete and wins are tallied, we can generate a final “win” amount for each director on each board. The individual director’s win share taken as a percentage of the total board wins represents each individual directors Influence Factor.

Every director where data is available has an Influence Factor, in most cases over multiple years. Influence changes over time given the variety of subfactors and KPIs considered as part of influence. Influence can also change depending on social network shifts, such as directors joining new boards and opening new relationships. The equation for summing and determining the final Influence Factor is below.



Figure 7: Finalizing the Influence Factor equation

$$inf_{C_i} = inf_{l_i} + inf_{t_i} + inf_{w_i} + inf_{r_i} - inf_{s_i} + inf_{x_i}$$

β : total count of directors on a company in a year

γ : number of directors meeting a specific criterion

inf_{l_i} : influence from a director's role on the board of directors (hierarchical wins)

inf_{t_i} : influence from a director's status score (ad hoc wins) - activist, special shareholder, tenure outlier, insider

inf_{w_i} : influence from a director's third degree network ties (competition wins, "1224")

inf_{r_i} : influence deriving from a director's resume (context wins)

inf_{s_i} : influence debit from a director's social score (binary debits)

inf_{x_i} : influence awarded due to a favorable structure of the board (special situations)

l, g : represents a specific cohort based on market capitalization and geographic location of the company

H : Roles hierarchy factor (number of wins is based on specific company board makeup):

ξ : Indicator binary



MEASURING DIRECTOR PERFORMANCE: OVERVIEW

The Influence Factors are used to determine Performance Attribution. In our example, once we have determined that Director Y's influence of Company X in 2022 was 15%, we can ascribe 15% of Company X's performance metrics to him/her/them. Performance is attributed in three distinct ways:

- Raw performance (outputting a raw numerical value ascribed to a particular director over time)
- "Win Rate" / Batting average (outputting an apples-to-apples ranked value between 0 and 1 that represents peer-relative performance)
- Flagged performance (outputting a binary flag for "exposures" to behaviors, controversies, or tendencies over time)

Our performance attribution can be done both out-of-the-box using a number of presourced metrics or bespoke using client-provided performance values. Currently, we support a number of ESG/sustainability and traditional company performance metrics on an annualized basis that include:

- TSR (total shareholder return)
- Market capitalization growth
- Revenue growth
- EBIT or EBITDA (earnings)
- ROE (return on equity)
- EVIC (enterprise value including cash)
- Debt to equity ratio
- Worker productivity (revenue per employee)
- Carbon emissions (scopes 1, 2)
- Carbon intensity (scopes 1 and 2 per dollar revenue)
- CEO pay ratio (total summary compensation to median employee compensation)
- Controversial business behavior (count vs. peers)
- Performance flags (human rights issues, environmental issues, restatements, et al)
- Water withdrawal
- Water consumption
- Gender diversity at executive level
- Gender diversity at company level
- Lobbying expenditure
- Labor strikes

For directors who serve on multiple companies over multiple years, we are able to assess each director's performance relative to how much influence they had over each company in each year.



MEASURING DIRECTOR PERFORMANCE: RAW PERFORMANCE

Company performance metrics can be divided up between directors in a given year relative to director's influence. Our performance metrics are designed to show an individual director's *ownership* of performance. In its simplest form, we take a director's influence in a given year and multiply it by the company outcome. For instance, our measurement of Market Capitalization Value Added simply takes the difference between year X and X+1 of company capitalization and multiplies it by a director's influence to indicate their "responsibility" for company value changes.

Raw performance metrics only include whole numerical numbers (as opposed to ratios, scores, or other inputs) with a focus on deltas, though we also generate raw carbon numbers (for instance) to show directors with high responsibility over emissions across multiple boards.

MEASURING DIRECTOR PERFORMANCE: WIN RATES

Win rate performance allows us to contrast a director against performance of peers in similar sized companies in similar sectors. In order to make that contrast, we develop "win rates" - a form of "batting average" for individual performance metrics.

Performance is only measured for directors that meet a minimum set of data and tenure requirements (minimum of two years tenure and complete data availability at the company level). Directors that do not meet those requirements are considered "unrated" in cases where we lack sufficient data, or "rookies" for directors where they have too short a tenure to be considered.

Company "Win Rate"

Our first step is to assess a company on a given metric. Consider three illustrative examples of Company A, B, and C, each large cap companies in different sectors where Director Y sat. For each, we will rank the companies against their peer group on a performance metric like TSR. In the example, Company A ranked 100th out of 1,000 peers in 2021. We could consider this as Company A "won" on TSR against 900 companies and "lost" against 99 companies. However, we "normalize" these wins and losses to make cohorts of various sizes equitable. If the largest cohort in the data was 1,200 companies deep, then we give Company A 1.2 wins rather than one win. This allows us to say that, over Director Y's tenure for these years, the companies on which he/she/they sat produced 5,307 "wins" to 4,500 "losses". Figure 8 highlights this method.



Figure 8: Company wins across sectors and sizes during Director Y's tenure

Yr	Company	Sector	"League"	Company Peers	TSR Rank	Maximum Company Group	"Win Value"	Win/Loss Record
2021	A	IT	3 (Large Cap)	1,000	100	1,200	1.2	1,080 - 120
2020	A	IT	3 (Large Cap)	900	300	1,300	1.4	840 - 420
2019	A	IT	3 (Large Cap)	1,100	300	1,300	1.2	960 - 360
2018	A	IT	3 (Large Cap)	1,050	700	1,200	1.1	385 - 770
2021	B	Cons Disc	3 (Large Cap)	650	50	1,200	1.8	1,080 - 90
2020	B	Cons Disc	3 (Large Cap)	700	670	1,300	1.9	57 - 1,273
2019	B	Cons Disc	3 (Large Cap)	725	540	1,300	1.8	333 - 972
2018	C	Industrials	2 (Mid Cap)	970	450	1,100	1.1	572 - 495
Ttl	A							3,265 - 1,670
Ttl	B							1,470 - 2,335
Ttl	C							572 - 495
Ttl	ALL							5,307 - 4,500

Director Attribution

Given the above performance of the companies in this case study, we can now easily ascribe individual "wins" to Director Y given their influence on each respective board. For instance, assume Director Y had 10% of board influence in 2021 on Company A - Director Y would be "responsible" for 108 of the 1,080 wins and 12 of the 120 losses. In this way, we can add up a complete picture of a director's performance over time on a peer relative basis in a simple way, and we can present it as a form of "batting average", which we refer to as a win rate. Figure 9 assigns Director Y attribution of wins and losses and a win rate, noting that Company C is labeled "Unrated" given tenure and data limitations. We can repeat this process across any performance metric in our dataset.

Figure 9: Assigning director performance across companies

Yr	Company	Company Win/Loss	Influence	Attributed Win/Loss	Win Rate
2021	A	1,080 - 120	10%	108 - 12	.900
2021	B	1,080 - 90	5%	54 - 5	.915
2020	A	840 - 420	11%	92 - 46	.621
2020	B	57 - 1,273	5%	3 - 64	.045
2019	A	960 - 360	9%	86 - 32	.729
2019	B	333 - 972	14%	47 - 136	.257
2018	C	572 - 495	12%	Unrated	Unrated
2018	A	385 - 770	7%	27 - 54	.333



Total			417 - 349	.544
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Using this method allows us to rank directors against each other on any metric across industries, sizes, and even geographies. In doing so, we separate out groups of directors into simple buckets. The buckets compare win rates for every director based on the largest capitalization sized company on which that director has had a seat. For instance, if a director was on a mid cap board that, for two years, crossed the large cap threshold before going back to mid cap, the director's win rate would be compared to large cap board members.

Figure 10: Director performance assessment

Win Rate Percentile (vs. Cap Size Peers)	Assessment
>90th	Hall of Fame
75th - 90th	All Star
55th - 75th	Starter
15th - 55th	Rotation
<15th	Benchwarmer
Unrated	Rookie

MEASURING DIRECTOR PERFORMANCE: FLAGGED PERFORMANCE

Flagged performance, generated as either simple binaries (any involvement in an issue at any board), accrued flags (counts of involvement), or influence-weighted flags (counts of involvement times influence for each instance) are meant to quickly indicate whether a director has been involved with a performance issue (and/or how often). Figure 11 illustrates a simplified example of this.



Figure 11: Company flags during Director Y's tenure

Yr	Company	Human Rights Flag?	Influence	Involvement Flags	Accrued Flags	Influence Weighted Flags
TTL	ALL			1	2	0.21
2021	A	0	10%	0	0	0.00
2021	B	0	5%	0	0	0.00
2020	A	0	11%	0	0	0.00
2020	B	0	5%	0	0	0.00
2019	A	1	9%	1	1	0.09
2019	B	0	14%	0	0	0.00
2018	C	1	12%	1	1	0.12
2018	A	0	7%	0	0	0.00



FREE FLOAT ANALYTICS™ DERIVATIVE DATA

The primary outputs for Free Float Analytics (Influence and Performance) have a number of secondary and tertiary derivative metrics that we provide as defined below:

- Network Power
 - Accrued market capitalization x influence of director, first degree connections, and second degree connections
- Connected Directors
 - Percentage of board that is connected inside two degrees
 - Number of directors on a board connected inside two degrees
 - Count of “loops” back to current or past company boards
 - Board network edge/node map
 - Social network centrality measures
 - Eigenvector
 - Modularity
 - Closeness
 - Betweenness
 - Degrees
- Gender Power Gap
 - Difference between gender influence (total influence of cohort on the board) and gender representation (percentage of cohort on the board)
- Diversity Power Gap
 - Difference between diverse cohort influence (total influence of cohort on the board) and diverse representation (percentage of cohort on the board)

Person Tags:

- Influencer (persistent high influencers across boards)
- Earnings Friendly (top performers for earnings)
- Environmentally Friendly (top performers for carbon)
- Scandalous (bottom performers for controversial business activities)
- Investor Friendly (top performers for TSR)
- Power Broker (highly connected directors, particularly between board communities)



USE CASES FOR FREE FLOAT ANALYTICS™

There are a multitude of ways to combine and view Free Float Analytics™ data. Known use cases include, but are not limited to:

USE CASE	METHOD	EXAMPLE
Engagement	Director Targeting	Target combination of weakest performer and highest influence for vote against Target nominating chairs at boards where diverse candidates have less influence than “body count”
	Policy Change	Target most influential directors on policy issues
	Robo Advisory	Use multiple issue or performance filters to identify directors for voting using automatic triggers
Portfolio	Tilting	Tilt portfolios toward more democratic boards Tilt portfolios toward diversity through influence vs. “body count” Tilt portfolios toward “carbon efficient” director groups
	Allocation	Allocating toward “director value”, on particular performance metrics
Activism and Human Capital	Activism	Building case studies on directors for removal Finding existing directors fit-for-purpose for adding
	Human Capital	Protecting existing directors by highlighting strengths Finding directors for placement on boards as part of nomination duties

While this is a truncated example of known use cases, there are ultimately a number of ways to use the data considering in pinpoints both financial and environmental, social, and governance (ESG) performance to individuals.



APPENDIX A: KPI LIST AND WIN SHARE CALCULATIONS

KPI	Category	Context Wins	Ranked: Threshold	Ranked: Head to Head	Ranked: Hierarchy
Company Chair	Role				✓
Company Founder	Role				✓
Family Member	Role				✓
Former Chair	Role				✓
Executive Director	Role				✓
Audit Chair	Role				✓
Pay Chair	Role				✓
Nominating Chair	Role				✓
Audit Member	Role				✓
Pay Member	Role				✓
Nominating Member	Role				✓
Company CEO	Role				✓
Company Lead Dir	Role				✓
Has Advanced Degree	Resume	✓			
Was/Is a CEO	Resume	✓			
Went to Elite School	Resume	✓			
Largest Cap Board	Resume	✓			
Gender Outlier	Network		✓		
Age Outlier	Network		✓		
Board Connections	Network			✓	
Tenure Outlier	Network		✓		
Activist Placed	Status		✓		
Large Shareholder	Status		✓		
Company Insider	Status		✓		



APPENDIX B: DIRECTOR NETWORK EQUATIONS

1. Modularity: communities in a partition of graph G

$$Q = \sum_{c=1}^n \left[\frac{L_c}{m} - \gamma \left(\frac{k_c}{2m} \right)^2 \right]$$

c = communities

m = number of edges

L_c = intra-community links within community c

k_c = sum of degrees of nodes in c

γ = resolution parameter

2. Betweenness centrality: sum of the fraction of all-pairs shortest paths that pass through node v

$$C_B(v) = \sum_{s,t \in V} \frac{\sigma(s,t|v)}{\sigma(s,t)}$$

$\sigma(s, t)$ = number of shortest (s,t) paths

$\sigma(s, t|v)$ = number of shortest (s,t) paths that pass through node v

3. Eigenvector centrality: centrality of a node based on the centrality of its neighbors in graph G . Perron-Frobenius theorem finds there is a unique and positive solution if λ is the largest eigenvalue associated with A .

$$Ax = \lambda x$$

A = adjacency matrix of G

λ = eigenvalue

4. Weighted degree: connection strength for edge i, j as measured by the sum of months of edge duration across all occurrences in matrix ΔQ

$$D_{w(i,j)} = \sum_{q=1}^n Q_{t(i,j)}$$



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