



SDG mapping methodology

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Introduction

Covalence SA, based in Geneva (Switzerland) since 2001, is specialized in Environmental, Social and Governance (ESG) research and ratings. Covalence's data is articulated in two dimensions: reputation and disclosure.

The reputation dimension covers qualitative data published by companies' stakeholders such as governments, international organisations, NGOs, the media and other third-party sources. This data is made of narrative content (web pages, articles, texts) and is often referred to as "ESG news data". Such data can have a positive or negative polarity, translating either compliments or criticisms.

Disclosure covers ESG data published by companies and is both quantitative (ESG indicators such as % of women in executive positions, CO2 emissions, water consumption, etc.) and qualitative (sustainability-related corporate communications). We source ESG indicators from Refinitiv (formerly Thomson Reuters).

The first ambition of this data is to inform on ESG practices, or ESG compliance; on how companies limit negative impacts, on how they commit to "do no harm".

Increasingly, companies' stakeholders such as investors and regulators want to know more than how companies comply with ESG criteria. They also want to know about the positive impact companies have on society and the environment, about how companies contribute to solving the world's major challenges as described in the UN Sustainable Development Goals (SDGs), about how they "do good".

SDG mapping

Covalence filters its ESG data and recodes it with the SDGs to show companies' exposure to the SDGs and document their positive impacts, providing insightful material for impact analysis and supporting thematic investment strategies.

The recoding of ESG data with the SDGs takes place in both dimensions of Covalence's methodology, disclosure and reputation.

To do so we refer to several policy and research documents among which:

- Global indicator framework for the Sustainable Development Goals and targets of the 2030 Agenda for Sustainable Development, United Nations
- Linking the SDGs and GRI, SDG Compass, UN Global Compact, Global Reporting Initiative, World Business Council for Sustainable Development
- Business Reporting on the SDGs: An analysis of the goals and targets, Global Reporting Initiative, UN Global Compact, PricewaterhouseCoopers
- Business Reporting on the SDGs: Integrating the SDGs into corporate reporting – a practical guide, Global Reporting Initiative, UN Global Compact, Shift



To produce SDG mappings, the ESG data gathered for the two levels of analysis, disclosure and reputation, is filtered and recoded with the SDGs.

Reputation

The basic metrics used by Covalence to measure companies' SDG reputation are quantities of news items gathered on the web (texts, web pages) from third party sources that are coded as having a positive (endorsements) or a negative orientation (controversies) towards named companies (polarity, sentiment). Considering negative news in addition to positives helps enhance credibility and mitigate greenwashing, or "SDG washing" risks.

This ESG news data, originally coded with ESG criteria, is analyzed using Natural Language Processing techniques and Covalence's dictionary composed of thousands of keywords in four languages (English, French, German and Spanish) and hundreds of topics and subtopics linked to the SDGs in a correspondence matrix.

For example, the news item below has been linked to SDG 4. Quality Education.

"Microsoft Corp. is doubling-down on its workforce development investment in El Paso, adding 15 public schools to its computer skills program and investing \$1.5 million in a binational business accelerator. Microsoft President Brad Smith made the announcement on Monday during a meeting with regional business and political leaders at the Epic Railyard building near Downtown El Paso."

A **historical erosion factor** is applied to the quantities of positive and negative news with recent articles weighting more than older ones.

Here is how we calculate **reputation scores**:

If the sets $\mathcal{P}(g, t)$, $\mathcal{N}(g, t)$ represent the positive and negative news for goal g aged at time t , where each element is the age in months of the news item, then, with a 2% erosion factor ($\alpha=0.98$), the eroded positive and negative news for goal g at time t are, respectively

$$P(g, t) = \sum_{p \in \mathcal{P}(g, t)} \alpha^p, \quad N(g, t) = \sum_{n \in \mathcal{N}(g, t)} \alpha^n$$

Total news = positive news + negative news. With a 2% erosion factor ($\alpha=0.98$), this translates to

$$\text{Total news volume} = V_R(d, t) = P(d, t) + N(d, t)$$

A score is given by the ratio between positive news and total news. For example, if a company has total news = 1622, negative news = 472, positive news = 1150, the score is $1150 / 1622 = 71\%$.

In the case of scores relying on a low volume of information, a **threshold**, T , is applied to bring scores close to 50% (neutral score). This is to avoid having very high or very low scores based on a small amount of data.

Taking this threshold into account, the reputation score for goal g at time t is

$$\text{Reputation}(g, t) = \text{Rn}(g, t) = \begin{cases} \frac{100P(d, t)}{V_R(d, t)}, & V_R(d, t) \geq T \\ \frac{V_R(d, t)}{T} \left(\frac{100P(d, t)}{V_R(d, t)} - 50 \right) + 50, & V_R(d, t) < T \end{cases}$$

Scores are calculated for each of the 17 SDGs.

Disclosure

In the disclosure score, we consider corporate communications (narrative content published by companies - web pages, press releases, etc.). As this is positive news, it can be considered as a subset of the total positive news. If $\mathcal{P}_E(g, t) \subseteq \mathcal{P}(g, t)$ is the set of positive news items provided by the company related to goal g , aged at time t , then the volume of news provided by corporate communications is

Disclosure
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$$V_p(g, t) = \sum_{p \in \mathcal{P}_E(g, t)} \alpha^p$$

Where $\alpha = 0.98$ represents a historical erosion factor of 2%. A **threshold**, T , is applied based on the volume of information so that the corporate communications score for goal g at time t is given by

$$CC(g, t) = \begin{cases} 100, & V_E(g, t) \geq T \\ \frac{100V_E(g, t)}{T}, & V_E(g, t) < T \end{cases}$$

Covalence sources quantitative ESG indicators from Refinitiv (formerly Thomson Reuters). We have linked selected ESG indicators to the SDGs, in order to document companies' disclosures relevant to these goals. For each selected indicator, the data is normalised into a 0-100 scale.

For example, for SDG 4. Quality Education the following indicators have been selected amongst others:

Indicator name	Indicator definition
Flexible Working Hours	Does the company claim to provide flexible working hours or working hours that promote a work-life balance?
Day Care Services	Does the company claim to provide day care services for its employees?
Employee Health & Safety Training Hours	Total hours of employee training on health & safety policies and procedures.
Health & Safety Training	Does the company train its executives or key employees on health & safety?
Supply Chain Health & Safety Training	Does the company train its executives or key employees on employee health & safety in the supply chain?
Training and Development Policy	Does the company have a policy to support the skills training or career development of its employees?
...	...

These questions may be qualitative or quantitative. **Qualitative** questions can have favourable or unfavourable answers to yes/no questions. In the normalisation process, favourable answers are awarded 100 points and unfavourable answers are rewarded 0 points. For example, 100 points are awarded to a company who answers "no" to the question "has the company had legal action taken against it by its workers in the last reporting period?" or "yes" to the question "does the company have a policy to improve its energy efficiency?". These are favourable

answers. On the contrary, answering “yes” and “no” respectively to the previous questions would award 0 points as these are unfavourable answers.

Quantitative questions may be answered with percentages (“what percentage of the workforce is female?”) or other figures (“what are the company’s annual CO₂ emissions?”). These numbers are normalised based on industry standards and are given a score between 0 and 100.

Questions to which the answers are unknown are given 50 points, so that the reporting score for goal *g* is

$$\text{Reporting}(g) = Rg(g) = \frac{100f + 50u + \sum_{\omega \in W} \omega}{\Psi}$$

Where *f* represents the number of favourable answers to qualitative questions, *u* represents the total number of unanswered questions, $\omega \in W$ are the normalised scores for quantitative questions and Ψ is the total number of questions answered by Refinitiv.

As a bonus, if it is higher than the reporting score, the corporate communications score is considered and the average is used as the disclosure score. If the corporate communications score is lower than the reporting score, then it is only the reporting score that constitutes the disclosure score.

We can then calculate a disclosure score from 0 to 100 for each SDG.

$$\text{Disclosure} = \text{Disc}(g, t) = \begin{cases} Rg(g), & CC(g, t) \leq Rg(g) \\ \frac{Rg(g) + CC(d, t)}{2}, & CC(g, t) > Rg(g) \end{cases}$$

SDG score

For each of the 17 SDGs, an average is calculated between the disclosure and the reputation scores, producing SDG scores. The table below shows SDG scores calculated for a sample of companies.

$$SDG(g, t) = \frac{Rn(g, t) + \text{Disc}(g, t)}{2}$$

Company name	4. Quality Education			5. Gender Equality			6. Water and Sanitation			7. Energy			8. Decent Work		
	SDG score	Disclosure	Reputation	SDG score	Disclosure	Reputation	SDG score	Disclosure	Reputation	SDG score	Disclosure	Reputation	SDG score	Disclosure	Reputation
ABB Ltd.	95	97	93	56	62	51	78	67	90	88	80	95	80	92	68
Danone	81	72	89	72	64	79	66	50	83	84	80	89	70	71	70
Equinor ASA	63	70	56	52	51	54	64	67	62	84	100	68	63	71	55
Microsoft Corporation	84	88	81	60	66	54	65	50	81	71	60	82	76	88	65
Akzo Nobel NV	64	72	57	48	45	52	55	50	60	64	60	68	65	75	55
Kimberly-Clark Corporation	83	72	94	65	63	67	64	33	96	78	60	95	77	75	78

On the chart to the right, the 17 SDGs have been placed in a bi-dimensional space according to **Microsoft's** reputation score on the vertical axis and to its disclosure score on the horizontal axis.

For Microsoft, the following SDGs are registering the highest SDG score: Quality Education; Partnerships for the Goals; Life on Land; Decent Work and Economic Growth; Industry, Innovation and Infrastructure.

