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Leveraging Technology to Improve Sustainability

An analysis of ESG data challenges

White Paper

We live in uncertain times, with planetary health crises impacting multiple industries. The recent COVID-19 pandemic has again shown the impact of environmental, social, and corporate governance (ESG) issues. It is noticeable that investors increasingly believe in companies with good ESG performance as they are considered less risky and better prepared for long-term uncertainty[1].

However, to determine the ESG performance of any company, there is a critical need for credible data, which is usually not available directly and publicly. Hence, it is advantageous to leverage artificial intelligence (AI), cloud computing, and data analytics applications to address data availability bottlenecks for making crucial investment decisions.

Why is ESG important?

ESG Pillars

Environmental

- Climate change
- Natural resource preservation
- Energy management
- Greenhouse gas emissions
- Raw material sourcing
- Renewable energy
- Water and waste management

Social

- Community relations
- Diversity and inclusion
- Working conditions
- Health and safety of employees
- Supply-chain standards
- Labor managemant
- Privacy and data security

Governance

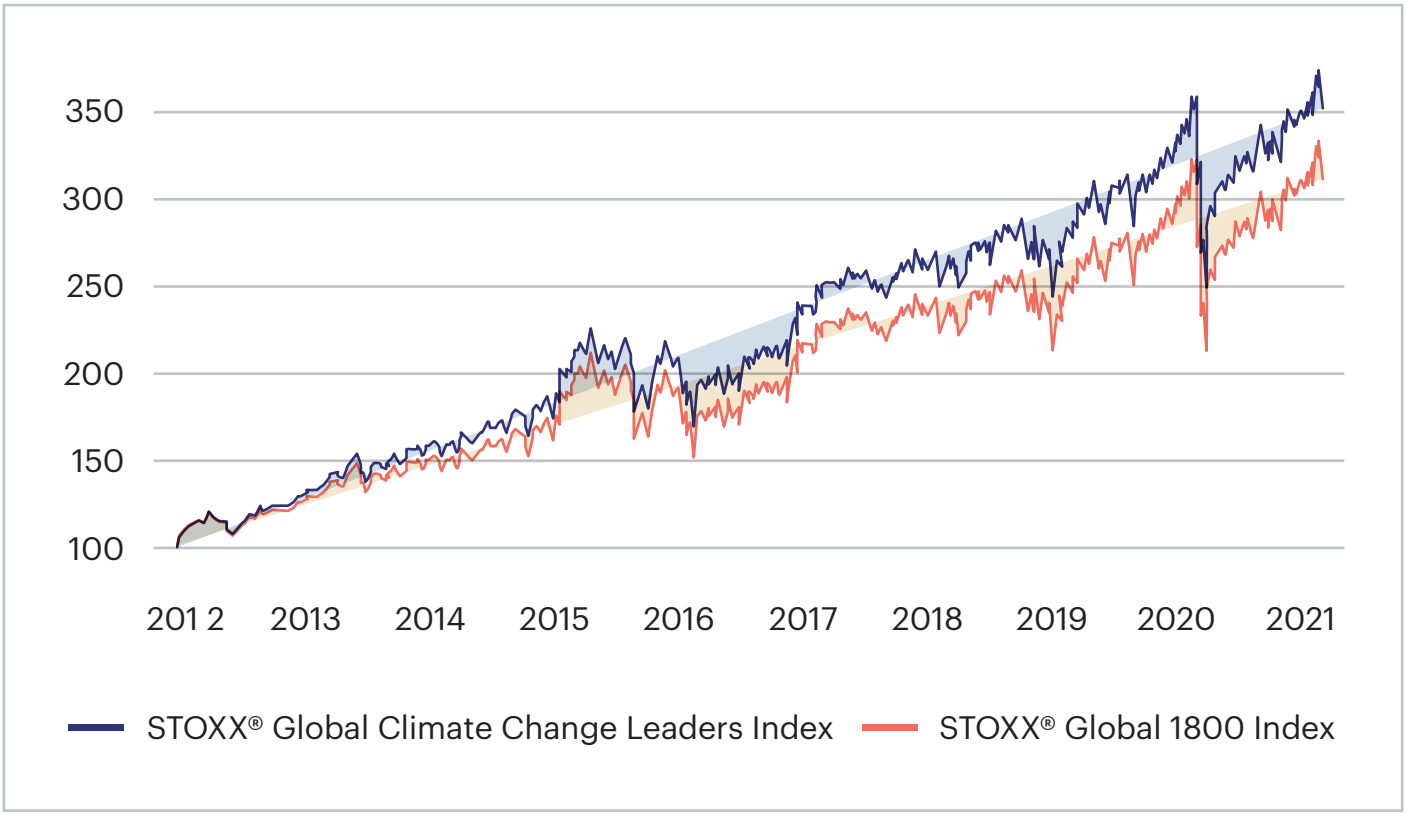
- Business ethics
- Executive pay
- Antibribery and anticorruption
- Political contributions
- Tax transparency
- Board diversity
- Structure of ownership

The ESG market has rapidly grown and evolved over the past decade and is set to double this year[2]. Investors, especially millennials, consider it a moral responsibility to do their bit to improve sustainability. Due to this trend, firms participating in sustainable activities are in demand, thereby increasing their valuation. Meanwhile, firms that are not involved in sustainable practices face financial disadvantages such as borrowing money from the market due to their low credibility and reducing share price. Ultimately, such firms are forced to improve their ESG performance to exist.

As a part of their ESG initiatives, firms are setting targets for carbon emissions and actively meeting quotas for diversity and inclusion. Robust sustainability strategies need to be developed by firms to avoid poor lending situations and exclusion from capital markets. It has been demonstrated that firms with strong ESG practices and strategies have higher financial growth and optimization, efficient business continuity, lower volatility, higher employee productivity, reduced regulatory and legal interventions, top-line growth, and operational cost reductions. Efforts to maximize the bottom line and pursue public interest are now complementary as profitability and doing good can go hand in hand[3].

Furthermore, firms that have successfully implemented sustainability and ESG strategies tend to outperform their competitors and other top global firms.

Performance and annual returns



Source: www.stoxxx.com

The issues of ESG data in capital markets

On the one hand, we see the benefits of improving ESG performance. On the other, there are various drawbacks to the available ESG data. This puts limitations on analyzing and weighing the ESG initiatives of any firm. The following are some ESG data-related concerns:

Inadequate ESG reporting and disclosures

Currently, 90 percent of the S&P 500[4] issue voluntary sustainability reports. However, the ESG-specific data available from public sources is dated and unreliable for investment decisions or corporate strategy-building. An EY survey[5] showed that 50 percent of asset managers stated that ESG reporting lacks forward-looking disclosures, and 46 percent consider the absence of real-time ESG-specific data a drawback. An article from the Wall Street Journal[6] has established a case for firms to provide frequent ESG data updates.

Lack of standardization

As the industry lacks standardization of ESG data attributes and rating calculations, investors find it difficult to compare ratings from various data providers. Several industry regulatory bodies are taking some initiatives toward such standardization. One such example is the International Financial Reporting Standards (IFRS) Foundation, which developed its own ESG standards[7].

Inadequate assurance

The assurance standards for ESG disclosures are still under development. The term ESG includes many distinct factors and aspects that challenge assurance teams. Therefore, a universal set of assurance standards are crucial.

The American Institute of CPAs[8] and the International Auditing and Assurance Standards Board have created reliable assurance standards. Yet less than 30 percent of ESG disclosures are assured[9].

Absence of ESG-specific accounting rules

ESG matters cover a broad range of issues well beyond the topics covered by financial accounting standards. Without a framework for calculation, it is challenging to quantify the ESG performance of companies. This is the case for many ESG concerns, with one notable exception - carbon. The Greenhouse Gas (GHG) Protocol[10] provides well-established and internationally accepted methods for measuring GHG emissions.

Inconsistency and non-comparable data

ESG data depends on a vast spectrum of factors. Hence it becomes practically impossible to compare and differentiate. Also, the ESG taxonomies and national identifiers vary geographically[1]. Such inconsistencies restrict and prohibit investors from making informed cross-border investments.

In addition, the underlying information for ESG data components varies across providers, thus making it difficult to understand and compare ESG scores across companies and their peer groups. Financial services firms expect data providers to explain their data processing and rating methodologies. But, many such providers cannot cite their sources[11]. ESG analysts utilize different imputation methods[12] to address the vast data inconsistencies across different companies and time periods. However, this causes disagreements among providers and leads to discrepancies.

Accessibility

Much non-financial data is in narrative or unstructured form. Hence it is challenging for asset and wealth managers to maintain a single data architecture for financial instruments[13]. One way to address this challenge is by maintaining a repository similar to those of banks for client risk information — a crucial aspect of the banking business. Although some larger firms have their research teams to measure ESG performance, smaller and more specialized institutions typically receive essential information from third-party vendors.

[1]Alongside EU taxonomy, China, Japan, Singapore, and Canada are now developing their own taxonomy versions and a UK Green Technical Advisory Group was established to review EU Taxonomy metrics to ensure they are appropriate for the UK market

Next-gen technologies – a promising solution to ESG data issues

AI, machine learning (ML), and data analytics are at the crossroads of innovation, technology, and sustainability. These advanced technologies will bring value to investors and the firms they invest in.

Data acquisition and processing
The ESG pillars mostly have unstructured information and data. AI and ML can scan such unstructured data from various sources and provide a structure to it by using clustering, convolutional neural network (CNN), deep neural network (DNN), and natural language processing (NLP).

Data complexity and AI/ML interventions
Transforming unstructured data to a structured form creates many dimensions or features in the data set, and it can face the curse of dimensionality. Too many dimensions can make clustering difficult and sparse, creating a strain on any AI/ML intervention. Conversion of unstructured data also exponentially increases the number of categorical variables.

Fortunately, different AI/ML interventions such as knowledge graphs, principal component analysis, manifold learning, and data processing strategies like one-hot encoding can help reduce or manage this challenge better.

Once the high dimensionality of data is managed, various AI/ML approaches such as classification and regression techniques (CART) algorithms, loss function configurations, hyperparameter tuning, and evolutionary computation can be used to derive insights from the data.

Such robust AI/ML technologies can generate meaningful insights from the ESG initiatives of firms and enable investors significantly by rationalizing the diverse ESG metrics from various vendors into a single scale. Effective use of AI and data analytics will also help firms reach their circular economy goals[14] by analyzing their sustainability performance and providing means to improve them.

Below are the various ways technology can help solve the above data issues.

ESG data challenges	Technological solutions
Inadequate ESG reporting and disclosures	Automation technologies such as robotic process automation (RPA) can help firms automate the rapid collection of data regarding their ESG performance. It can assist in increasing the frequency and accuracy of ESG disclosures. Additionally, AI-powered models can leverage historical data to provide realistic and predictive ESG reporting. As a result, asset managers will be aided by more frequent forward-looking ESG reporting and disclosures.
Lack of standardization	Technology can be an excellent tool for regulators in formulating standard policies and procedures required to measure and report ESG data. It can help analyze substantial amounts of quantitative and qualitative data. Timely qualitative data helps investors and rating producers be well informed and aids in the formation of common minimum standards[15].
Inadequate assurance	Firms can leverage technology to analyze unstructured ESG data, thereby helping them measure their non-financial performance. This will make it easier to create common assurance standards. Due to standardization, even the audits of ESG data metrics can be effectively conducted internally and by external agencies. For example, the supply chain industry necessitates analyzing hundreds of supplier contracts (unstructured data) to assure fair labor standards. It requires that appropriate ESG clauses support these standards. Such complex tasks can be easily accomplished effectively with technology in a shorter duration.

ESG data challenges	Technological solutions
Absence of ESG-specific accounting rules	AI-powered solutions can aid in quantifying the qualitative ESG data. Availability of quantitative ESG data will help create a framework to measure ESG performance and accounting rules.
Inconsistency and non-comparable data	The industry previously had a lot of unusable data due to its size, bad data, and data gaps. Technology allows algorithms and computer programs to read such information to fill in data gaps and solve data problems in the new era. As a result, inconsistencies in ESG data sets across different data providers can be resolved. Investors can make well-informed decisions by comparing the data and ratings from various data providers.
Accessibility	**Availability:** Technology makes it possible to create and maintain a single data repository for all ESG-related information. **Usability:** Technology can bring meaning and usability to previously unstructured data. **Digestibility:** Semantic analysis can analyze the tone and content of any available information about a firm and provide a significant sentiment regarding the firm's ESG performance to investors. For example, an NLP program can read the transcript of a CEO's speech about the earnings call of a firm to determine the tone or sentiment of the speech and subsequently identify ESG-related topics. It can then conclude how committed a firm is to mitigating sustainability risks[16].

Something for everyone

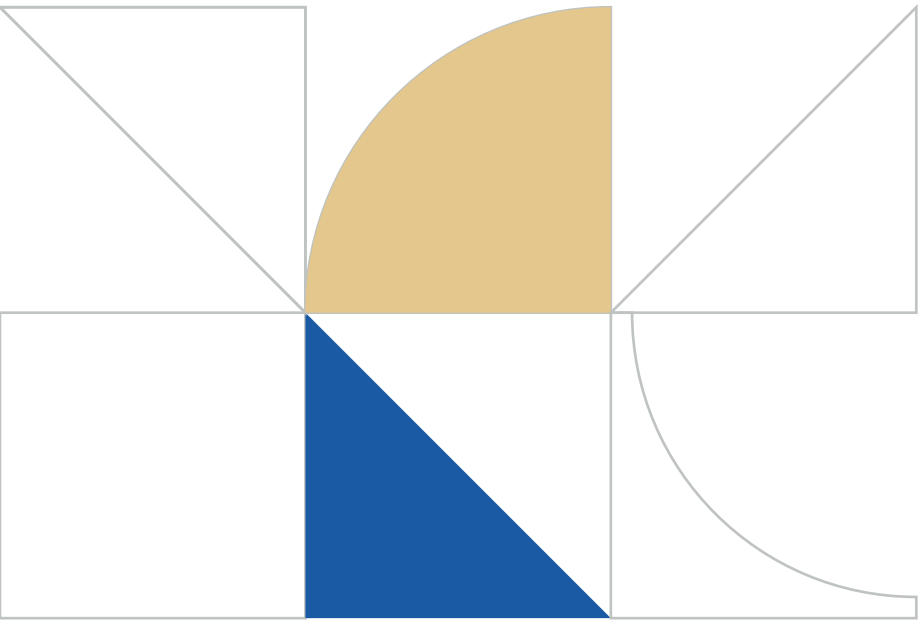
Earlier, it was not feasible to analyze raw data of ESG factors. However, advancement in technology has made this possible, enabling **ESG data and analytics providers**[17] with timely indicators for rating and index calculations.

Technology is now available for anyone and everyone, making it critical for **firms** to possess reliable ESG credentials to be competitive. The availability of timely and better quality ESG data can help **investors** build investment strategies.

Conclusion

Global warming, climate change, pandemics, or social wellbeing are no longer buzz words but are critical in determining the sustainability of any firm. Firms are acknowledging these challenges positively and are making ESG as one of their key performance indicators. In the past, analyzing the data required for ESG had many hurdles, such as unstructured and scattered data. These challenges can now be effectively addressed with advanced technologies like AI/ML, automation, and NLP.

The industry's current need is to have a common framework for measuring and reporting ESG performance as ESG investments will be a significant competitive factor for firms and investors soon. Even regulators will need to build checks and balances around ESG reporting. Every participant will have to work together to enhance ESG disclosures, data standards, and consistency.



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