Exploring Social Origins in the Construction of Environmental, Social and Governance Measures

Job Market Paper

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Abstract

As both demand and supply for information about companies' sustainability performance continues to grow, many investors complain that the ESG data universe is getting too complex, lacking clarity about measurement and comparability. Corroborating this concern, several studies have shown how ESG data vendors display very little agreement on how to construct ESG measures. However, as our paper shows, methodological reasons are only one reason for ESG divergence. Instead of comparing the "how" of differences in ESG measurement, this paper focusses on the "why" of this divergence. Leveraging insights from a sociology of quantification and knowledge construction, as well as Foucault's reading on authority, we thus set out to explore the differences between ESG measures as a result of a data vendor's Social Origins: the function of historical origins and the processes of construction which occur within them over time. Three dimensions are examined: data vendors' conceptualization of sustainability, their definition of materiality and their specialization. Examining these Social Origins of nine ESG data vendors, we reveal patterns which suggest that data vendors either pursue a financial value-driven or a normative, values-driven strategy in their creation of ESG data. We further discuss how this difference relates to diverse processes of quantification and the authority which measures are given.

INTRODUCTION

Whereas companies' disclosure of financial information is well-defined through national and international accounting standards, disclosure of non-financial data, often referred to as

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environmental, social, and governance (ESG) measures, remains unorganized and without universally accepted standards to refer to. Still, the demand for non-financial disclosure is rising rapidly, especially to inform what is often referred to as responsible, impact, or ESG investing. The 89 trillion US Dollars in assets under management by signatories to the United Nation's Principles for Responsible Investment (PRI) is only one point of evidence on how large the demand for ESG data is (PRI, 2018). At the same time, the empirical evidence grows that positive ESG performance (Eccles, Ioannou and Serafeim, 2014), Corporate Social Responsibility (CSR) (Flammer, 2015) and long-term orientation (Flammer and Bansal, 2017) is related to positive financial performance. Furthermore, research shows that incorporating material ESG data in investment decisions can contribute to superior returns (Beal et al. 2017; Khan, Serafeim and Yoon, 2016), and that a sustainable strategy can provide competitive advantages (Ioannou and Serafeim, 2019). Due to all these factors, the demand for high quality and comparable ESG data will likely continue to grow.

This paper seeks to explore the nature and origins of ESG measures by analyzing how the history and sense-making of the architects of this data – what we call the ESG data vendors – have influenced the characteristics and diversity of this significant new body of information which is increasingly used to assess companies in the capital market. To do so, we look at ESG through the lens of a sociology of quantification (Espeland and Stevens, 2008) and knowledge construction (Berger and Luckmann, 1966), leveraging insights from a historical view on quantification (Porter 1994; 1995) and making use of Foucault's views on discipline and authority (1977; 1980). We also build on the notion of individuals as carriers of institutional logics and influences (Pache and Santos, 2010; Almandoz, 2014; Fiss and Zajac, 2004). This inquiry is relevant because it sheds light on a fast-growing and complex market of increasingly influential data, which investors, companies, and other stakeholders are faced with.

Research Strategy and Structure of Inquiry

By looking to meet the demand for ESG data, its vendors supply a variety of products which seek to address the information asymmetry about non-financial concerns that exists between companies and their investors (Doh et al, 2010). These concerns include a wide range of issues from, for example, a company's contribution to climate change (the E), its efforts to uphold international labor standards (the S), to the gender composition of its Board (the G).

To standardize what constitutes the E, S and G in ESG, and therefore which non-financial matters companies should report on, organizations such as Global Reporting Initiative (GRI), the CDP (former Carbon Disclosure Project) and the Sustainability Accounting Standards Board (SASB) have been created. For example, according to GRI, 82% of the world's largest 250 companies, and in total over 5000 firms, use GRI standards to report on their sustainability performance (GRI, 2019). SASB, on the other hand, is a framework more frequently used by investors. Yet, despite this growing agreement on certain frameworks, a standard definition of what constitutes ESG remains to be absent. Metrics underlying ESG data from different vendors therefore remain diverse, particularly regarding the choice of indicators which measure each ESG dimension, the aggregation methodologies and weights applied (Berg, Koelbel, and Rigobon, 2019). These technical differences of ESG give cause for much debate and make some question the legitimacy of using this data for financial assessment.

To enrich this debate with a deeper understanding about the origins of these technical differences, we explore what we term the 'Social Origins' of ESG. In other words, we set out with the aim to understand why technical differences in ESG came about. We explore the "raison d'être" of ESG data and the sense-making which data vendors went through in the creation of these metrics, rather than attempting a deep inquiry into the fine details of methodological distinction. We therefore see our paper as complementary to the MIT's "aggregate confusion" paper (Berg, Koelbel, and Rigobon, 2019), which offers a deeper insight

into how technical divergence between different ESG sources is created. Social Origins, for us, are therefore a combination of the historical, organizational origins of ESG data vendors and the social construction that took place within the organization due to these origins. For this, we assert the classic understanding of social construction that links sense-making to social circumstance and assumes that categories are not found in nature but are established and given validity by our practices and the artefacts created through them (Berger and Luckmann, 1966). According to this, we consider institutional factors, such as diverse local environments, individual factors, such as founders' backgrounds and motives, and organizational factors, such as ownership structure and influential clients. Based on this, we argue that there is no 'correct' technical solution in measuring ESG and that differences must be seen as a function of diverse Social Origins.

To assess these Social Origins, we studied historical and current documents and conducted interviews with the leaders and founders of nine data and analytics organizations, most of whom have merged or been acquired by one another: Vigeo, EIRIS, KLD Research and Analytics Ltd. (KLD), Innovest Strategic Value Advisors (Innovest), MSCI ESG Research LLC (MSCI), ISS, oekom, Sustainalytics, and GES International. We analyze three dimensions in which data vendors diverge and which we find to have an influence on ESG measures, methodologies and products: their conceptualization of sustainability, their definition of materiality, and their specialization. In doing so, we find patterns that suggest that ESG data vendors have diverging logics in their creation of ESG, which are either shaped by financially 'value-driven' or normative 'values-driven' interests.

The article is structured into five sections. Section one provides a review of the current ESG universe, highlighting main trends and complexities in this growing sector. The second section provides the theoretical framework, assessing ESG through the lens of a sociology of quantification and knowledge construction. Through theory, we explore how the

idiosyncraticity of ESG as measures with public purpose was shaped within five dimensions of quantification. Section three discusses the cases we studied and the data and methodology we have used to assess them. Section four explores the Social Origins of our nine cases with the help of three analytical dimensions - conceptualization of sustainability, definition of materiality, and specialization. The final section offers a discussion and concludes.

THE COMPLEX WORLD OF ESG

The ESG Ecosystem

The historical origins of organizations that collect data on social and environmental issues connected with firms' operations can be traced back to the late 1970s. When sustainability issues first entered the considerations in the capital market, they were mostly driven by NGOs who were seeking to inform concerned investors about companies' involvements in controversial issues such as nuclear weapons development or Apartheid South Africa. The concept of "ESG" itself was coined much later, namely by the 2004 United Nations Global Compact Report on "Who Cares Wins: Connecting Financial Markets to a Changing World" and the 2005 "Freshfield Report" of the UN Environmental Program's Finance Initiative (UNEP-FI). Both form the basis of the United Nations-backed Principles for Responsible Investment in 2005. The idea of ESG was quickly adopted as a key concept that was able to capture the increased capital market interest in sustainable finance. Organizations that had been creating information for SRI since the early 1990s assumed the label ESG and several new organizations emerged to respond to the increased demand for this data. Today, the ESG ecosystem encompasses a vast number of data vendors, offering a wide variety of products including overall rating scores, sub-ratings on specific issue areas, rankings of companies, and tools which provide custom-made evaluations of companies' ESG performances. According to the former Global Initiative for Sustainability Ratings and The Reporting Exchange, over 100

organizations are collecting data, analyzing, rating, and ranking company ESG performance today.

Depending on the topic and geographical focus, data vendors collect the ESG information needed for rating periodically, usually annually, and in a variety of ways. They use surveys to companies, analyses of company documents, such as sustainability reports, interviews with personnel and other stakeholders, such as trade unions and NGOs. Some, such as Corporate Human Rights Benchmark, Ethisphere, JUST Capital, and Reputation Institute administer surveys to individuals to capture perceptions of companies along various dimensions. Increasingly, data vendors leverage natural language processing and machine learning technologies to scrape the web of unstructured data and gain an advantage over self-reported company data with externally sourced information. Start-up enterprises such as TruValue Labs, Util and Normative are examples of this trend.

Each ESG data vendor determines how the collected data is assembled to create a specific range of indicators, aggregation rules and weights (Berg et al., 2019). However, since transparency about indicators and methodologies is low, the distinct contribution of diverse methodologies is not always obvious. Additionally, there is a wide range of organizations which use data from ESG data vendors to create their own rankings and aggregate index solutions. Mainstream data vendors like Bloomberg and Thomson Reuters are distribution channels for these ratings, alongside a wider offering of financial information. Organizations such as CSR Hub and the World Benchmarking Alliance serve as aggregators of data from a variety of sources. In few other cases, non-data selling organizations use surveys to collect their own data.

Consolidation Trends

Figure 1 shows that there has been substantial consolidation of rating agencies over the course of the last 30 years.

[Insert Figure 1 about here]

Despite this trend, the diversity of ESG data vendors remains impressive, particularly because new vendors with new methodologies keep appearing. Some of these organizations are for profit, others are non-profit, and some have a subject matter focus, such as climate (e.g., the CDP) or human rights (e.g., Corporate Human Rights Benchmark). Increasingly, data vendors diversify their service offering, moving away from only selling data and research to investors, to offering consulting services or including multiple technology solutions in their portfolio, such as application programming interfaces. Additionally, data vendors face pressures to grow and internationalize the universe of companies they cover, as their customers seek ever larger quantities of data to benchmark their analyses. This benefits the larger data vendors and supports the consolidation on the ESG market.

Since consolidation is high, one may think that convergence of indicators and methodologies may follow. However, evaluating six different rating agents, Chatterji et al. (2016) show that convergence is unlikely to occur due to missing common theorization and commensurability in the ESG industry. Common theorization describes the shared beliefs raters need to have about a conceptual discourse, for example, on how food has to be to receive a Michelin star (Rao, Monin and Durand, 2003). In the case of ESG, a shared belief of what being socially responsible means. These shared views could decide which concepts and dimensions investors are told to care about and which industries are viewed as harmful. Commensurability, on the other hand, describes whether different raters measure the same construct in a similar way, which for ESG is not the case (Chatterji et al. 2016; Berg, Koelbel, and Rigobon, 2019). Despite the consolidation shown, convergence in ESG measures is thus unlikely as both common theorization and commensurability of ESG are low.

Comparability of ESG

As comparability of ESG data sources remains low, but demand continues to rise, meta-ratings emerge to “Rate the Raters” (SustainAbility, 2018) and initiatives, such as the “ESG Ratings

and Rankings Working Group" at the World Business Council for Sustainable Development (WBCSD), try to help companies understand and cope with the differences in ratings they receive. These meta-studies address investors' need for clarity about the large amount of ESG data they can choose from. Companies, on the other hand, are overwhelmed with the large number of surveys they are asked to participate in every year, with almost 60% of companies getting 10 or more requests for surveys per year (Brown Flynn, 2018). The resulting survey fatigue may have negative effects on data quality in terms of representativeness and data accuracy. ESG data disclosure may additionally be biased towards companies that have more capability to provide the information, such as larger or financially more affluent companies, or those who are more inclined to put in the extra effort, such as those from particularly risk-bearing industries or regions.

Seeking clarity within this complexity, several academic studies try to assess the validity of ESG data. Studies such as Sharfman (1996), Delmas, Etzion and Nairn-Birch (2013) and Chatterji et al. (2016) document the misalignment of various social ratings and conclude that comparability of ESG data is low. In particular, the MIT Aggregate Confusion project's paper (Berg, Koelbel, and Rigobon, 2019) outlines five practical reasons why various ESG data sources diverge: scope divergence, weight divergence, aggregation divergence, measurement divergence and the rater's effect. In their data-set of five different ESG data sources, they are able to show the noisiness of correlations between ESG data sources. With an average correlation of 0.61 this is far above those of, for example, credit ratings from Moody's and Standard and Poor's, which are correlated at 0.99 (Berg, Koelbel, and Rigobon, 2019).

The common shortfall of assessments of ESG data validity is that they concern themselves with questions of whether and how ESG data sources differ, without focusing on the why. Since there are no measurement and reporting requirements for ESG information, the emergence of a variety of vendors with diverse data, moving in to address the market need for information,

is a standard market-driven process of competitive differentiation. Discussions on ESG data diversity are often fueled by the underlying question of whether there is a "best" solution to measuring ESG. However, since concepts used for the creation of ESG data are socially constructed, we argue, there is no objective right or wrong. Instead of looking for the best source, users will benefit more from understanding how Social Origins shape this data, to assess how to best use it for their own needs. For example, when producing their own social construction of investment decisions.

ESG QUANTIFICATION AND KNOWLEDGE CONSTRUCTION

Fuzzy Concepts and Context of Rankings

Corporate ratings and rankings, both financial and non-financial, are artefacts used to address information asymmetry in financial markets. The creators of these ratings therefore act as information intermediaries who provide newly collected or newly assembled information to evaluate the performance of companies in various fields. Usually, systems for corporate evaluation address a market need which is not yet, or not fully, addressed through publicly mandated disclosure (Healy and Palepu, 2001). These evaluation systems are both influenced by institutional environments and firms' behaviors, simultaneously shaping them, as their influence rises. Ratings can achieve varying degrees of formalization that push firms to adopt specific behaviors to avoid scrutiny and maintain access to resources (Doh, et al. 2010). Literature on financial ratings, for example, show that if a critical market mass accepts and uses the ratings of a specific organization, it can have a significant influence on large amounts of investment allocations (Del Guercio and Tkac, 2008). Following this logic, social and environmental ratings have become increasingly powerful in the last decade: the data platform Bloomberg reports that customers using ESG have more than tripled in the last seven years[2].

[2] Bloomberg online, 2019; https://www.bloomberg.com/impact/products/esg-data/, last accessed Sept 2019.

However, whereas the assessment of financial firm performance relies on financial accounting and reporting standards, capturing a firm's ESG activities, for which there are no standards, and which are not under mandated disclosure, is considerably more difficult. The conceptual variety of non-financial firm assessments is therefore much larger than that in financial accounting due to both the difficulty of quantitatively capturing fuzzy concepts[3] such as ESG, sustainability, Corporate Social Responsibility (CSR), or Corporate Social Performance (Wood and Jones, 1995; Igalens and Gond, 2005; Gond, et al. 2018), and due to raters' need to establish a recognizable identity in a quickly growing market (Negro, Hannan and Rao, 2011). Several streams of literature discuss this difficulty of quantitatively capturing specific sustainability issues in areas such as climate change (Steffen, et al. 2015), environmental management (Toffel, 2006; Delmas, Etzion and Nairn-Birch, 2013), and labor standards (Bartley, 2005; Locke, 2013), all of which are confined by the limits of reporting, certification, and auditing to capture objective evaluations (Short, Toffel and Hugill, 2015).

Notwithstanding these difficulties, the number of evaluations about a company's sustainability activities in the form of ratings and rankings is on the rise. Yet, once released into the market ESG evaluations leave room for interpretation and can be prone to local biases. For example, firms have been documented to give biased responses to rating questionnaires due to their external environments (Crilly, Zollo and Hansen, 2012; Delmas and Toffel, 2008; Philippe and Durand, 2011). Also, firms from the same industry and geography are likely to have similar concerns, as they relate to the same regulative, normative, and cognitive factors of a shared context (DiMaggio and Powell, 1983). Yan, Ferraro, and Almandoz (2018) additionally show how a country's financial logic in interaction with local social factors influences the number of

[3] A concept from linguistics, it describes how some "natural language concepts have vague boundaries and fuzzy edges and that, consequently, (…) [allocation of attributes] will very often be neither true, nor false, nor nonsensical, but rather true to a certain extent and false to a certain extent, true in certain respects and false in other respects" (Lakoff, 1975). We use this term here to describe the undefined boundaries of broad concepts such as sustainability.

local investment funds with interest in sustainability. Raters can be influenced by their local heritage, particularly when producing social ratings with underlying socio-political pre-conceptions (Déjean, Gond and Leca, 2004). Furthermore, notions of individuals as carriers of institutional logics can be important in shaping organizational practices (Pache and Santos, 2010; Fiss and Zajac, 2004). They offer one way of explaining how people's assumptions and values may determine an organization's strategic direction (Fiss and Zajak, 2004), particularly when carried by an organization's founder (Almandoz, 2014).

Quantifying Environmental, Social, and Governance Logics

Quantification is the production and communication of numbers (Espeland and Stevens 2008). It is part of our everyday lives. In fact, it is hard to imagine political and corporate activities without a strong base of measures on which to base the predictions and expectations that underlie every-day decision-making (Porter, 1994). Internationally standardized tools of quantification, such as accounting systems – the backbone of performance measurement in modern organizations – or statistical measures to assess poverty and wealth – frequently used to make policy decisions – are powerful artefacts of the deep embeddedness of quantification in our social and economic lives. In making information quantitative, we satisfy our need to track changes, create traceable processes, and assess compliance (Espeland and Stevens 2008). It implies a move toward a more public form of knowledge and an impersonal and objective assessment of information (Porter, 1994). Yet, while we take many measures for granted, quantification is a process that entails sense- and decision-making. It consequently yields a high potential for imperfections and fallibility of methodologies, relying on processes of path dependency and social construction (Espeland and Stevens 2008). Pressures to carefully assess measures and revise their implications have therefore grown in recent decades (Porter 1994, 1995; Power 1997), especially for measures with a so-called public purpose (Hunter, 1980).

ESG measures are produced by private entities to inform private investments with a financial objective, it is therefore not immediately self-evident to qualify them as measures with a public purpose. Still, the essence of ESG is linked to the theoretical thinking of CSR and Socially Responsible Investing (SRI), addressing the firm's ability to better manage its relationship with society and the environment (Caroll, 1999; Igalens and Gond, 2003). It therefore links corporate action to an understanding of public responsibility and accountability (Preston and Post, 1975). This is exemplified by the use of ESG measures, which can, for example, be used to assess how corporations can help realize the United Nations' Sustainable Development Goals (Betti, Consolandi, and Eccles, 2018). They are further tied to the recognition of a public corporate purpose beyond Friedman's (1978) notion of shareholder primacy, requiring companies instead "to produce profitable solutions to the problems of people and planet" (Mayer, 2018: 42).

To evaluate how the process of quantifying environmental, social, and governance logics has influenced the character and purpose of ESG, we use five dimensions for the study of quantification put forward by Espeland and Stevens (2008): 1. the work required for quantification, 2. the reactivity of measures, 3. their polyvalent authority, 4. their tendency to discipline human behavior, and 5. their aesthetics[4]. By using these dimensions, we hope to outline the idiosyncratic characteristics of ESG and frame the discussion of our cases.

The costly creation of ESG. While any form of quantification requires considerable work, the endeavor to capture environmental, social, and governance logics within a limited number of indicators is particularly ambitious. As there is no generally agreed-upon set of measures to capture the fuzzy concepts which describe a firm's non-financial performance, the construction of ESG is virtually left to the discretion of the undertaker. To achieve an enduring system of

[4] Espeland and Stevens discuss these five dimensions in a slightly different order: 1. Work, 2. Reactivity, 3. Discipline, 4. Authority and 5. Aesthetics. For the purpose of discussing ESG, we decided, however, to discuss authority before discipline as this progression, in our opinion, lends a better logic to the fabric of ESG.

quantification, however, measurement requires rigor, public credibility, and recognition (Espeland and Stevens, 2008), particularly when creating measurement systems with a public purpose. Moreover, if there is an advantage to be gained from deception, quantification should include strict processes and instruments, as well as well-trained specialists to audit them (Porter, 1994).

Generally, ESG data vendors are under no obligation to follow any particular guidelines or standards in their data creation. Each ESG data vendor follows unique internal processes to create ESG measures which are often opaque and vary greatly between vendors, making auditing virtually impossible. These differences can lead to diverse assessments of a company's non-financial performance, even on the same issue (Chatterji et al. 2016; Delmas et al., 2013; Sharfman, 1996). Such differences are important because they can lead to significantly diverse ratings and associated recommendations, creating a confusing data universe which may overwhelm investors and generally undermine the credibility of ESG (Delmas, Etzion, and Nairn-Birch, 2013; Gray, 2010; Margolis and Walsh, 2003). Yet, it is precisely the costliness and complexity of creating consistent, longitudinal ESG data why this information and its vendors are still and increasingly widely used and influential in the financial markets. While many large investors now employ their own department of ESG analysts, smaller fund managers often don't have the resources to create a data universe which can match the time scale and scope of those created by large ESG data vendors over the last 20 years. This gives ESG data vendors a contested position of power in the financial market. It also results in an ambiguous relationship between data users and the ESG data they use, which is seen as an inherently imperfect yet unavoidable, because hardly reproduceable, source of information.

Reactivity of ESG. Measures intervene in the world they depict: they cause their users to think and act differently (Espeland and Sauder, 2007). Because the purpose[5] and meaning of quantification is usually established through use, measures are embedded in larger social projects, which are, in turn, affected by them (Espeland and Stevens, 2008). Performance measurement is therefore rarely an end in itself, but is employed to foster improvement (Behn, 2003). Measures as a means to an end have a long history and are a part of the reason why businesses can act globally today. Global exchange-rates and standardized financial statements, for example, enable businesses to cross boarders despite linguistic and cultural differences (Cohen 1982). These measures shape global markets and simultaneously create the need for new measures as market interests and challenges evolve. As a result of this, the meaning of measures changes as they travel through time and space (Espeland and Stevens, 2008).

In ESG, measures are typically used to estimate the risks that are associated with the externalities of a firm, such as climate change or conflict in societies. ESG measures are generally used to evaluate firms, which indirectly triggers the need of a company to improve its scores. Active investors use ESG scores to track and engage with companies around their improvement in specific areas of interest. Others trust that the gradual pressure of increasing use of ESG will create capital momentum away from companies with low ESG scores, thereby forcing them to increase their overall ESG performance.

This reactivity of ESG measures creates new categories and images of corporate behavior. Hacking (1999) refers to this phenomenon as "making up people," where measures draw boundaries that frame activities and allocate people into smaller, consequential groups. In ESG, counting companies' violations not only triggers a process of explicit sense-making about corporate preparedness to deal with certain environmental, social, and governance risks, it also

[5] Behn (2008) describes eight managerial purposes of measures for public managers, which can be transferred to the private space: "performance measures [can be used] to evaluate, control, budget, motivate, promote, celebrate, learn, and improve". He, however, also postulates that "unfortunately, no single performance measure is appropriate for all eight purposes" (Behn, 2003: 586).

affects the image of a company in the eye of the beholder, which can be linked to an implicit moral judgement. ESG indices and rankings therefore not only create categories of high- and low performers, they also create historical precedence for what constitutes a morally good and bad company.

The authority of ESG. Measures create knowledge and knowledge is power. Foucault (1977) highlights how knowledge shapes discourses, institutions, and practices and is therefore ubiquitous: "there is no power relation without the correlative constitution of a field of knowledge, nor any knowledge that does not presuppose and constitute at the same time power relations." (Foucault, 1977: 27). Measures can further alter relations of power by affecting how resources, status, knowledge, and opportunities are distributed.

According to the sociology of quantification, the authority given to measures is nested in the sense of accuracy and validity they convey, their usefulness, and their association with objectivity and rationality (Espeland and Stevens, 2008). In this context, ESG data displays a somewhat idiosyncratic characteristic as it does not derive its authority from a sense of accuracy, but rather from its unique position in the data market and the difficulty of imitating its products in scale and scope, as described above. It is therefore the data vendor's control over a niche market, rather than a prescribed sense of legitimacy, that lends authority to ESG measures. This authority is still consequential: based on ESG indices and rankings stocks can be held or sold and directly influence the financial liquidity and value of a company.

If given authority, measures can persuade and steer the thinking and decision-making of entire systems. This is especially true if measures make "a priori separate things hold together, thus lending reality and consistency to larger, more complex objects" (Desrosières, 1998). ESG, under this lens, lends its assessments to a more tangible understanding of the fuzzy notion of sustainability which allows for an objective assessment of a not strictly defined concept. Porter and Haggerty (1997: 279) hereby assert the necessity to distinguish between disciplinary

objectivity and mechanical objectivity: the former is characterized by "a reliance on the professional decision-making practices of select elites", whereas the latter emphasizes "the need for standardized rules and procedures in order to arrive at decisions on public issues." While advocates of ESG ultimately seek mechanical objectivity, the processes of ESG data creation still relies heavily on disciplinary objectivity, which explains why ESG measures are therefore likely to be subjected to a high level of scrutiny and scepticism (Porter and Haggerty, 1997). To move to an authority derived from legitimacy, ESG objectivity would therefore have to move towards systems of mechanical objectivity with a mandated or agreed-upon standard.

The power of ESG to discipline. In his book "Trust in Numbers", Porter (1995) assesses quantification as a technology of governance. If given authority, through the above discussed modes, measures can consequently be used to discipline the behavior of those which are observed through the quantification. In Foucault's (1977) view, discipline is a mode of modern power which is especially asserted through surveillance and visibility. With numbers one can simplify, compare, classify and essentially inflict a judgement on the observed. Quantification is therefore linked to judgement through the process of making formerly hidden attributes visible. Confirming this in a study that examines the role of quantification for law, Espeland and Vannebo (2007) find that accountability and transparency are increasingly associated with monitoring systems.

Because ESG measures are often used for monitoring purposes, the measures can exert a certain amount of discipline on the examined companies. The power of discipline based on ESG measures is however subject to important constraints. First, reaction to ESG scores are linked to individual action in a system where only collective action will result in consequential disciplinary action. ESG will therefore only discipline a company or industry if enough actors or a sufficiently important actor, such as the company's largest shareholder, support the view that certain ESG shortcomings should be considered for consequential activities, such as

investment allocations. Second, disciplinary action based on ESG is likely moderated by market factors. It could therefore be that companies with a higher financial performance face lower ESG discipline than companies with financial difficulties, because of their market attractiveness. Even if this is not true, companies in good financial health would not be as affected when disciplined by action based on ESG, as those with less financial resilience.

However, while ESG can be used by investors and consumers to discipline companies directly, for example through withheld investments and purchases, its most effective disciplinary effects may be created through auto-disciplinary processes within companies. In other words, if external pressure through surveillance increases, companies may internalize the attendance to certain issues if perceived as critical to success. The upsurge in corporate carbon offset policies is an example of this. The most effective disciplinary consequence of ESG is therefore likely that which is self-imposed.

The aesthetics of ESG. The aesthetics of quantification describes the ability of presenting measures in ways other than numbers, such as graphs and imagery. Aesthetics help users and readers grasp the key message of a measure more easily. The ease with which a measure can be displayed aesthetically can therefore influence its acceptance and credibility. While raw ESG data is first captured in numbers, the importance of aesthetics for ESG are not to be underestimated. This is due to a) the importance of achieving buy-in from unconverted audiences to expand the ESG market and b) the necessity to create readily usable and easily understandable commercial tools for actors who are not experts on environmental and social matters. Both are connected to the importance for ESG data vendors to create a unique and recognizable identity on the market (Negro, Hannan and Rao 2011). The product solutions and services offered by data vendors are often highly reflective of a certain image the data vendor wants to convey. Ultimately, it is the data vendor's bread and butter to process and present ESG data in a way that even uninformed users can grasp its added value.

DATA AND METHODOLOGY

Case Selection

To examine the ESG data universe we selected for-profit organizations which are relevant in terms of size, i.e. revenues, and significance, i.e. brand recognition among ESG users, with balanced representation from both Europe and North America. According to the Global Sustainable Investment Alliance both regions together represent 95% of the ESG market (GSIA, 2017: 7). Our primary selection included Innovest, KLD, MSCI, and Sustainalytics from North America, and EIRIS, Oekom and Vigeo from Europe. Due to mergers and acquisitions in the recent history of these data vendors, we then additionally included GES International and ISS to be able to complete our understanding also of the recent developments in the Social Origins of these ESG data vendors. Figure 2 summarizes the history of mergers and acquisitions between these organizations.

[Insert Figure 2 about here]

From the nine organizations that we examined, only four remain as independent ESG data providers and are the ESG market-leaders today: MSCI ESG Research, Vigeo-Eiris, ISS-Oekom, and Sustainalytics.

Data and Case Analysis

To examine our cases, we conducted interviews with either the founders or the current executives of the examined ESG data vendors. In some cases, founders and executives are the same person. We only interviewed organizations that create their own ESG data or have done so in the past, such as Vigeo-Eiris, Oekom, KLD, Innovest, Sustainalytics, MSCI and GES, not including the organizations that bought into the sector, such as Moody's, ISS, or Morningstar. In the form of an unstructured and in-depth interview of 1 – 1,5 hours, we broadly led each interviewee into a conversation about the history, motivation, and methodology of their

organization. In addition to these interviews we conducted an in-depth analysis of publicly available documents and online resources for each case. Historical information was retrieved through the online archive Wayback Machine. Table 1 summarizes the interviews held for this paper and Table 2 outlines the dimensions used to structure the data.

[Insert Table 1 & Table 2 about here]

As a data verification step, we sent the descriptions in a first working paper to our interview partners for feedback in case of misinterpretation or factual errors.

THE SOCIAL ORIGINS OF ESG METRICS

Analytical Dimensions

To examine the historical and organizational development of our cases, we formulate three analytical dimensions, which we assume to have an impact on ESG measures, methodology, and products: a) data vendors' conceptualization of sustainability, b) their definition of materiality and c) their specialization.

Conceptualization of sustainability describes how data vendors perceive and contextualize the purpose of ESG as instruments in the capital market. In other words, a data vendor's conception of sustainability frames his understanding of ESG and why he thinks that indicators of environmental, social and governance performance are important to be considered in a company's analysis. Such framing can manifest through specific indicators selected to capture ESG issues, painting each category in a particular light. It can also give way to moral world-views which manifest in preferences of one category over another, for example favoring environmental over social, and specific types of measures, such as policy vs. performance related, and qualitative vs. quantitative measures.

Definitions of materiality reveal the way in which data vendors prioritize issues of ESG. Materiality recognizes that some information is more important to investors than others:

According to the U.S. Supreme Court, information is material if there is "a substantial likelihood that the disclosure of the omitted fact would have been viewed by the reasonable investor as having significantly altered the 'total mix' of information made available" (Basic, Inc. v. Levinson, 485 U.S. 224, 1988). Khan, Serafeim and Yoon (2016), using the classification of SASB, show that this definition of materiality is positively correlated with shareholder returns. Alternatively, as advocated by the GRI, materiality is seen as an externality: "[material] aspects [are those] that reflect the organization's most significant economic, environmental and social impacts." In other words, SASB's materiality definition focusses on the effects of ESG on a firm, while the GRI focusses on the effects of a firm on ESG. Whether and how materiality is applied to ESG can significantly influence how metrics are aggregated and weighted. Efforts to capture the materiality of ESG issues leads to conceptual discrimination between material and immaterial issues, which often vary between industries (Khan, Serafeim and Yoon 2016).

The specialization of an ESG data vendor reveals the mission and purpose of an organization and highlights its core value proposition and business strategy. This dimension is firmly linked to the historical origins of an organization and can have a large impact on the strategic positioning of a data vendor in the ESG market, and on the specific products and services are that are offered. Since an organization's strategic position will decide on its core audience and matters of interest, it may also influence which metrics and measures are being chosen and ultimately how their added-value is presented.

We show, in a first step, that each of the analytical dimensions is influenced not only by one, but by various characteristics of a data-vendor's Social Origins. The characteristics of the analytical dimension, then, influence the process of quantification and impact how ESG is ultimately constructed. Figure 3.A illustrates this conceptual framework.

[Insert Figure 3.A about here]

Since our analysis is retrospective and based on incomplete data, we can only identify and infer from larger patters of developments in our case's history and not make direct causal claims. We recognize that there are several hidden connections and intervening variables which we will not be able to recognize. Finally, while we assume that the Social Origins of an organization are fixed in time, the characteristics of the outlined analytical dimensions can, on the other hand, change over time. A data vendor's decision about measures, methodologies, services, and products in t = 1 can therefore influence the way it defines sustainability, materiality and specialization in t = 1 + n. This reactivity is depicted through a feedback loop in figure 3. With this frame in mind, the following section will examine the links between selected Social Origins and our analytical dimension, highlighting how this impacted on either measures, methodologies, or products and services of ESG. We begin with a short recollection of each data vendor's most important historical cornerstones and then move into each analytical dimension.

The Historical Origins of ESG

ISS-Oekom. Founded in 1993 by a German environmental publishing house as a private start-up in Munich, the predecessor of today's oekom, Ökom GmbH, was set up for the specific purpose of developing environmental ratings. After successful years in the environmental ratings business, oekom research AG was created in 2002 as a public spinoff of Ökom GmbH to focus on a broader concept of corporate responsibility rating. Before 2002, the main base of clients consisted of German church investors, NGOs, and international organizations, such as Greenpeace and WWF, consulting firms, asset owners, and few asset managers. In 2018, oekom ratings covered about 4,000 companies in 57 countries, serving over 180 asset managers and asset owners in 13 countries, thereby influencing around $1.5 trillion assets under management (oekom, 2018). The company employed 90 staff, including 60 analysts.

Institutional Shareholder Services (ISS) Inc. was launched 1985 in the UK as an organization to promote good corporate governance and to raise the level of active and informed proxy voting among institutional investors. In 1992, it became the first organization to offer agency voting services. In 2006, ISS was acquired by RiskMetrics and was owned by MSCI from 2010 until April 2014, when it was purchased by Vestar Capital Partners and then sold to Genstar Capital in October 2017. With the acquisition of Swedish Ethix in 2005, ISS entered the SRI advisory market. A strategic partnership with RepRisk, a Swiss reputational risk research firm, followed later that year. In March 2018, ISS acquired oekom, forming ISS-oekom. For ISS, this was a chance to widen its portfolio to a more holistic ESG service and product offering. For oekom, this presented a chance to widen its growth potential to the larger and more international client base of ISS, staying relevant in a growingly competitive global ESG market.

MSCI ESG Research. KLD Research & Analytics, Inc. – formerly known as Kinder, Lydenberg, Domini & Co. – was founded in Boston in 1988 with the mission to "remove barriers to socially responsible investing, [and] provide superior research and support services to the socially responsible investment market" and the purpose to "influence corporate behavior toward a more just and sustainable world" (KLD, 2005). With an activist attitude and a focus on institutional investors, KLD rapidly grew into one of the most important ESG data providing companies in the United States and soon worldwide.

Innovest Strategic Value Advisors, Inc. was created in 1995 in New York by Dr Matthew Kiernan, a former partner at KPMG and director at the World Business Council on Sustainable Development (WBCSD), and Hewson Baltzell, who came from Lehman Brothers and JP Morgan Chase. The company's founders aspired to promote and provide research for the link between environmental and financial performance, forecasting an "eco-industrial revolution,"

which would re-center environmental concerns for matters of competitiveness and profitability[6].

MSCI was created in 1986 when Morgan Stanley bought the rights to the indexing business from Capital International[7] and became a pioneer in developing the market for global equity indexes. Whereas Morgan Stanley is still a majority shareholder, MSCI is not a division of the investment bank, but an independent company. Today, MSCI is listed on the New York Stock Exchange with a market cap of approx. $20.26 billion and about 3,000 employees[8].

In 2009, both KLD and Innovest were acquired by RiskMetrics, a risk management and corporate governance company which, in 1994, spun out of J.P. Morgan's internal value-at-risk program. In 2010, MSCI acquired the RiskMetrics Group, including KLD, Innovest, and ISS, thereby launching the MSCI ESG Research Inc. Whereas ISS was sold off in the following years, KLD and Innovest remained within MSCI ESG Research, using Innovest's methodology as what is MSCI's ESG today (Eccles, Lee and Stroehle, 2019). With roughly 200 research analysts, MSCI ESG Research provides ESG ratings for over 7,000 companies and more than 650,000 equity and fixed income securities worldwide.

Sustainalytics. Created in 1992, Jantzi Research was one of the first North American companies, shortly after KLD, to offer solutions for non-financial data and research about companies for investors. First focused on indexing the Jantzi Social Index for the Canadian capital market, Jantzi Research soon created partnerships in Europe, namely with the Dutch Sustainability Ranking (DSR), a Triodos bank company, and Scoris GmbH, a joint venture of European rating agencies. In 2003, the three partners formed the Sustainable Investment Research International (SiRi) Group. With the Spanish research company AIS (Analistas Internationales en Sostenibilidad) joining SiRi as research partner in 2005, the group's global

[6] Wall Street Journal (19/07/1998) "For Wall Street, Increasing Evidence That Green Begets Green", by C. Deutch.
[7] Thus, the name: Morgan Stanley Capital International, MSCI
[8] Google Invest, last accessed July 2019.

reach spread to the Latin American market. SiRi Group formally merged into Sustainalytics in 2009, with Triodos Bank, MeesPierson, the Dutch pension fund PGGM, and Michael Jantzi as main shareholders.

In 2016, Morningstar acquired 40% of Sustainalytics. Morningstar is a publicly listed US company, with a market cap of $6.7 billion, which offers data and research on a wide range of financial investment offerings, including real-time global market data. The company offers asset management and investment advisory, with about $200 billion under advisement and management. Since 2016, the company now also offers a Morningstar Sustainability Rating using Sustainalytics data.

In 1992 in Stockholm, two Swedish Greenpeace activists founded a CSR screening and consulting firm under the name of Caring Capitalism, later renamed to Caring Company. It particularly developed CSR audits with measurable human and labor rights indicators. With the development of investment screening and engagement service for the Swedish AP1 fund in 2000/2001, the company moved away from consulting and towards investor services. In 2003, Caring Company changed its name to Global Engagement Services (GES), to underline its now exclusive focus on investor and engagement services. The clients of GES were largely from the European market, with a majority of Scandinavian institutional investors. In 2019, GES was acquired by Sustainalytics, today known as Sustainalytics Engagement Services.

Vigeo-Eiris. The origins of the Ethical Investment Research Services (EIRIS) Ltd. lie in London in 1983, where a group of churches and charities set up a foundation to fund an independent research organization to help them make informed decisions on how to invest responsibly and avoid companies such as those involved in Apartheid South Africa. Inspired by the Campaign Against Arms Trade, which revealed questionable investments of governmental and charitable bodies, EIRIS's origins lie in consulting activities for NGOs and

charities, including investment and campaign target screening, charities, and donor screening services.

The research company Vigeo was created under French law in 2002, taking over the activities of Arèse, the first SRI rating agency in France. The driving force behind this creation was Nicole Notat, the former secretary general of the French labor union CFDT, who was looking to set up an organization that would drive new CSR benchmarks for asset managers. In 2010, Vigeo expanded by launching its sustainability audit business for companies.

In 2015, EIRIS and Vigeo merged into Vigeo-Eiris, a private company of European scope with a wider range of service offerings not only for institutional investors and asset managers, but also for private investors, NGOs, charities, as well as public entities and companies. After the merger, Vigeo-Eiris counted about 200 employees and set up headquarters in Paris, France. Vigeo-Eiris' body of shareholders contains investors and financial actors (95%), civil society organizations (2%), and companies (3%)[9].

Conceptualizations of Sustainability

Capturing an organization's conceptualization of sustainability is difficult, as it is often an implicit understanding that influences many aspects of an ESG data vendor's business but is rarely explicitly defined. In our attempt to capture this notion, we reviewed a range of proxies which we expect to reflect how sustainability has been conceptualized in each organization. We focus in particularl on a review of three areas: founders' professional backgrounds, early clients and shareholders, and the vendor's original mission and purpose. With the help of examples, we first illustrate how these issues may have influenced the conceptualization of sustainability at each data vendor. We then discuss how these conceptualizations in turn may have affected choices in measures and methodologies.

[9] http://www.Vigeo-Eiris.com/Vigeo-Eiris/shareholders/, last accessed July 2019.

Social Origin I: Founders' backgrounds. Founders' professional backgrounds and motivations imprint on the conceptualization of sustainability that underly definitions of ESG within an organization. In the case of KLD, for example, all three founders were deeply immersed into the early SRI movement and a belief in creating data for the enablement of systemic change. Another founder who was inspired by the early SRI movement, but more interested in investment research than systemic change, was Sustainalytics' Michael Jantzi, founder of Jantzi Research. Similarly, EIRIS was founded by churches and charities to create knowledge to enable responsible investments. Founders who moved into ESG from a CSR background were Nicole Notat of Vigeo, former president of one of France's largest labor unions, and Magnus Furugard of GES International, a former Greenpeace activist and economist. Both organizations were originally built to enable and support socially responsible business before moving into data creation for investors. Oekom, founded by an environmental publishing house, focussed on sustainability mainly as environmental sustainability in the beginning. Innovest's founders, coming from the banking and consulting world, primarily advocated for the financial importance of corporate environmental information. Other organizations whose founding interest in ESG was driven by the financial value of non-financial considerations were MSCI Inc., Morningstar, and ISS.

Social Origin II: Clients and other Stakeholders. Most data vendors had a specific type of client in mind for their early products. The interest and preferences expressed by these early clients may then have had an important influence on how ESG was further framed within each organization. For example, both EIRIS and oekom have worked with charities and churches from the early years on. Both organizations therefore had to have a credible ethical component in their products to be relevant for these clients. KLD, on the other hand, had mostly large institutional investors as early clients and therefore catered to long-term, universal ownership

concerns. Innovest and later MSCI worked with large asset managers with an interest in financially material ESG data.

Social Origin III: Mission, vision, or purpose. Written company statements of mission, vision, or purpose are often used for marketing purposes and may not always reflect truthfully what an organization is doing. However, we assume that a purpose or mission statement, at the very least, can give an indication of where a data vendor would like to see itself and which public agenda it prescribes to. Mission, vision, and purpose can also be captured in statements and quotes from leaders or founders of an organization. In the mission of Vigeo-Eiris, for example, social responsibility is defined as "commitment to responsible performance which serves legitimate objectives, […] and enables positive differentiation" (Vigeo-Eiris[10], 2018). The criterion of 'legitimation' hereby suggests a strong consideration of legal standards and social norms and the influence of its stakeholders such as churches, charities, and trade-unions. In the case of KLD, its system-level focus was expressed with the vision "to achieve […] greater corporate accountability and, ultimately, a more just and sustainable world."[11] And Innovest's mission highlighted "a particular focus on [the] impact on competitiveness, profitability, and share price performance"[12].

Outcomes: Dimensions and Benchmarks. Connecting an organizations' conceptualization of sustainability to how it measures ESG is not always straight-forward. Still, when looking at the founder's backgrounds, their early clients and missions, we find patterns that suggest a differentiation between more normative, values-driven organizations, and those which seem to be more financially, value-driven. Especially in their years of their foundation, organizations could be split into two categories: those that wanted to create data to "inform" the world for financial analysis, versus those that created data to "transform" the world for positive systems

[10] http://www.Vigeo-Eiris.com/vigeo-10-years-already-by-nicole-notat/, Last accessed April 2018.
[11] web.archive.org/web/20071109045842/http://www.kld.com:80/about/index.html, last accessed April 2018.
[12] https://web.archive.org/web/20030525181746/http://innovestgroup.com/, last accessed Aug 2019.

change and avoidance of harm. Value and values-propositions are, however, not mutually exclusive. Most values-based data vendors also believe that ESG can enhance financial return, but this is not their primary reason for creating the data. Also, value-based data vendors can have a strong normative position. Their strategy is however linked to the belief that ESG will become mainstream because it is financially relevant.

How, then, does this value vs, values inclination influence a data vendor's methods? We see patterns particularly in the choice of dimensions and benchmarks. Figure 4 summarizes the ones used by the four data vendors which remain today: ISS-Oekom, MSCI, Sustainalytics, and Vigeo-Eiris. The full list of their indicators can be found in Appendix A1-A4.

[Insert Figure 4 about here]

The indicator types displayed in figure 4 suggest that an organization's orientation towards a values-based understanding of ESG leads to more use of qualitative measures, whereas a value-based focus favors quantitative metrics. Whereas quantitative measures usually capture performance metrics, qualitative measures focus more on issues such as processes and policies. Customers looking for financial materiality in ESG are therefore interested in a quantitative, large and possibly long-term consistent data format to be able to include ESG in financial analysis. Qualitative data, on the other hand, may offer more nuance on specific companies and may better serve actors with an advocacy agenda.

To seek public legitimacy, values-based data vendors also seem to rely more on public benchmarks than their value-based competitors. For example, the original oekom rating methodology was based on the so called "Frankfurt-Hohenheim Guidelines (FHG)", an extensive set of 800 criteria for the ethical evaluation of companies developed by the German social ethics and Catholic theology professor Johannes Hoffman. Vigeo-Eiris to date uses an extensive list of universally recognized standards as benchmarks, ranging from broader ILO

and UN conventions to specific EU green papers to ensure the legitimacy of its assessments. Its agenda is also consistent with the GRI: 96% of issues covered by the GRI framework are included in Vigeo-Eiris assessments (GRI, 2018). Similarly, GES's assessment norms were benchmarked to international standards, relating violations directly to specific international conventions and guidelines on human rights, labor standards, environment, and corruption. Value-based data vendors, on the other hand, do not link their dimensions as consequently to public standards. This is possibly related to the fact that their proposed added value is measurable in financial units. Their legitimation is therefore linked to the correlation of their ESG indicators with financial returns, not to public standards.

Finally, other specific choices in the dimensions used to capture ESG appear to be linked to the organizations' and founders' backgrounds. Vigeo-Eiris, for example, has put a higher emphasis on the dimensions of human resources and human rights at the workplace than the other data vendors we examined. The historical connection of Vigeo's founder to the French labor movement therefore seems to have led to an emphasis of labor issues[13] in their definition of ESG. The rating agency ISS-oekom, on the other hand, whose historical focus was mainly on environmental issues, to date only considers two instead of three ESG categories: environment is one dimension, whereas a combination of social and governance issues (where governance is understood as a part of the social dimension) represents the second dimension.

Definitions of Materiality

Since there are two basic definitions of materiality—what investors care about and what matters to the world--we assume that a data vendor's choice for one or another definition of materiality is influenced by its Social Origins. The concept of materiality particularly

[13] See full list of indicators under these dimensions and the additional dimensions of promotion of equality, elimination of illegal working practices such as child or forced labor, prevention of inhumane or degrading treatment such as sexual harassment, protection of privacy and personal data in the Arista certification description (Arista, 2015).

influences weights and methodologies used to aggregate ESG measures, putting a higher importance on some and less on other issues. In a first section we review how and why each data vendors perceives materiality, before examining how this might have affected weights and the choice of specific indicators.

Social Origins IV: Material Issues and Significant Stakeholders. Closely related to the concept of materiality is the notion of significant stakeholders. Or in other words, the understanding of who the ESG research and data is ultimately created for. Where materiality is not explicitly defined or is not used, it therefore helps to review the significant stakeholders of an organization to triangulate how materiality is defined.

Materiality as externality, as defined by GRI, takes an outside-in perspective and regards the impacts of companies on social and environmental stakeholders. This can be found at Vigeo-Eiris, for example, where risks and opportunities are not only assessed for the company, but also for those that are in the company's wider ecosystem. Similar to this yet without referring explicitly to materiality as a concept, KLD defined important issues as those which contribute to the benefit of the wider society: "KLD's analysis combines an awareness of the overarching impact companies can have on social and environmental conditions […] it therefore rates companies on both how they address the ESG challenges within their industry and how they treat all stakeholders" (KLD, 2007). Oekom acts under the acknowledgement that "the natural environment has an intrinsic value extending beyond its pure economic value. […] oekom research seeks to arrive at a fair and socially acceptable balance of interests which takes into account the fundamental importance of an intact, natural environment for social and economic development" (oekom, 2016). GES's understanding of materiality was very close to that of oekom, considering a wide range of significant stakeholders and their well-being as material.

Materiality as non-financial factors that are relevant to investors, the definition used by SASB, regards the financial importance of ESG issues. MSCI, for example, is a data vendor working

with this definition: "A risk is material to an industry when it is likely that companies in a given industry will incur substantial costs in connection with it. An opportunity is material to an industry when it is likely that companies in a given industry could capitalize on it for profit" (MSCI, 2017). This definition exists equally at Morningstar, where, following its origins as financial rating agency, it assesses material issues solely according to long-term positive financial returns of portfolios. In both cases, the most significant stakeholders are therefore the investors.

Sustainalytics is somewhat of a hybrid case in their understanding of materiality, with a rather wide definition of stakeholders, but nevertheless a focus on financial returns. Sustainalytics' assessment of materiality, for example, uses GRI's G4 Guidelines, pairing them with Sustainable Development Goals (SDGs) where applicable. At the same time, a qualitative and quantitative ecosystem map is used to address the questions of how strongly the management of an environmental or social concern is linked to a business driver that can create economic value. When assessing the material issues of companies, Sustainalytics therefore considers links between the management of environmental and social impacts, the GRI approach, and a company's competitiveness, the SASB approach.

[Insert Table 3 about here]

Table 3 summarizes the materiality focus and the previously discussed conceptualizations of sustainability at each data vendor. We find patterns of linkages between the chosen materiality and the values- vs. value-based juxtaposition. Whereas values-driven data vendors tend to define a wide range of significant stakeholders and materiality as an externality, the value-driven data vendors focus on investors and shareholder and define materiality in terms of long-term financial returns.

Outcomes: Weights and Material Issues. When examining the weights applied and issues selected by different data vendors, four larger strategies can be made out: a) weights and indicators by industry, b) weights and indicators by issue or area, c) the definition of criteria which give cause for exclusion, and d) the definition of issues with universal importance. We find that almost all data vendors use some industry specific indicators. Still, data vendors who follow a financial materiality logic are particularly thorough in applying industry logics when using weights or sub-industry scores within their ratings. Data vendors which view materiality as an externality more often use issue-specific weights and indicators and apply a universal value to certain matters. Criteria which give cause for exclusion can be found regardless of the materiality definitions, yet the exhaustiveness of these exclusion criteria is higher for values-driven data vendors.

Weights and indicators selected by industry can, for example, be found in the former Innovest and current MSCI methodology, where material issues are identified for each industry and thus either selectively collected or subsequently weighted at the sub-industry levels. Sustainalytics also uses industry-specific indicators, yet without sub-industry weights. The Morningstar Sustainability Rating, on the other hand, diverges from the industry logic and focusses on the portfolio level instead. Portfolio ESG-scores are assessed as the asset-weighted average of a portfolio's normalized company-level scores with deductions made for any controversies.

Weights applied by issue and geographic area could be found, for example, at GES, KLD, and Vigeo-Eiris. Criteria and indicators developed by GES were weighted differently according to geographical and cultural contexts. Lack of freedom of association policies were, for example, less pressing if companies only had operations in countries with strong labor laws (Arista, 2015). At KLD, assessments favored corporations with strong stewardship of the environment, devoted to serving local communities, high labor standards, and high quality and safety of products. Here, strengths and weaknesses were assessed without ever giving an overall score

to companies, avoiding an aggregation of negative and positive externalities. At Vigeo-Eiris, the importance of issues is weighted by three factors: 1. The nature of stakeholders' rights, interests, and expectations, 2. The vulnerability of stakeholders by sector, and 3. Risk categories for the company. Additionally, criteria considered geographical and cultural contexts, such as sensitive political or cultural backgrounds (Arista, 2015).

The definition of issues with universal values can be found, for example, at oekom. While indicators are equally selected by industry, specific criteria are of 'universal relevance.' These are seen as important irrespective of geographical location, sector, and development status (Arista, 2015). Interestingly, MSCI also has universal values: Corporate Governance is always material and therefore always weighted and analyzed for all companies. The logic for this lies in the assumption that good governance facilitates environmental and social performance.

Specialization

Although ESG data vendors are increasingly developing into so-called "one-stop shops," certain notions of specialization can still be identified. Specialization signals a particularly strong expertise in one or more areas and these are linked to data vendors' Social Origins.

[Insert Table 4 about here]

Table 4 summarizes the product and service offerings of the remaining four data vendors amongst our cases. As expected, a large range of products and services are offered by each of these organizations. Still, one can find that specific data vendors offer more products within a certain area of specialty or offer very specific products, which lie outside the mainstream ESG service offering. Of these particularities amongst a data vendor's product and service portfolio, we find links to the organizations' early issue focus, its early product portfolio, and links to mergers and acquisitions throughout the organization's history. With the help of examples, we elaborate on whether and how specialization comes through in the product and services offered by a data vendor.

Social Origins V: Early Focus and Product Portfolio. As we show in our section on the data vendors' organizational histories, each of the data vendors we examined originally had a narrower issue focus than it has today. While a trend towards diversification can be expected as organizations grow, we also expect to find some lingering effects of data vendors' specialization in their earlier years. Within our pool of cases, early foci can be categorized into four areas: the primary focus on a) environmental issues (oekom and Innovest), b) social issues (Vigeo, EIRIS, and KLD), c) governance issues (GES and ISS) or d) financial analysis (MSCI and Morningstar). Only Sustainalytics, as a later product of mergers between several rating agents, cannot easily be placed into these categories.

We find that these categorizations appear to have parallels with our earlier classification of data vendors' preferences for value- vs. values-driven strategies. In most cases, data vendors that had an early focus on environmental and social issues fall under our values-driven category. Those with an early focus on governance and finance are more inclined towards a value-driven strategy. This pattern does not, however, hold for Innovest, which was, from early days on, primarily interested in the financial materiality of its environmental assessments.

Social Origins VI: Acquisition, Mergers, and Partnerships. As the trend of consolidation in the ESG market continues, a data vendor's expertise in a specific area can also influence its acquisition strategy. The specialization in this area is then due to the acquired company's origins and not the parent company's past. Sustainalytics and GES are a good example of this., where GES today, after acquisition, forms Sustainalytics' specialized engagement arm. The decade-long specialization on engagement services which is now offered by Sustainalytics is therefore based on an early and long-term issue focus of GES, not Sustainalytics itself. The reputational risk advisory offered at ISS is another example of this. A service offered exclusively by ISS amongst our cases, and therefore and indicator of specialization, this

expertise relied entirely on a strategic partnership with RepRisk, a Swiss reputational advisory firm. ISS itself had no previous experience in this field.

The creation of ISS-oekom through the acquisition of oekom also fits into this pattern, where different areas of expertise were joined. ISS seeks to offer its clients – mainly asset owners, investment managers, hedge funds, broker-dealers, and custodian banks – additional support for socially responsible investing. For oekom, ISS-oekom offers the opportunity to further scale business and the universe of companies assessed, and therefore to compete against larger competitors such as MSCI. Compatibilities between oekom and ISS lie additionally in issue areas. Whereas oekom focuses strongly on social and environmental impact analyzes, ISS is a global leader in providing corporate governance solutions. In other words, where oekom is an expert in 'E' and 'S,' ISS will provide a significant input on the 'G' of ESG.

Finally, amongst our examined cases, Sustainalytics has likely the widest range of product offers exclusively focussed on ESG. Through a range of acquisitions and strategic partnerships, Sustainalytics systematically expanded its portfolio, ranging from a wide variety of web-based tools, alert tools, and issue radars to the more "standard" services of ESG integration and portfolio assessment. With this diversification through acquisition strategy, Sustainalytics considers itself as "an innovator of SRI intelligence and products, services and tools."[14]

Outcome: Product and Service Offers. In most of our cases, the early issue focus is indeed still somewhat manifested in current product offers. At MSCI, for example, products have always focussed on the financial materiality of ESG, a legacy from the methodology of Innovest. Also, ISS, having served the market as an advisor for investor activism, continues to concentrate its expertise on solutions for corporate governance and proxy voting rather than social and environmental issues. It therefore still analyzes about 200 factors in four pillars:

[14]https://web.archive.org/web/20060205080437/http://www.jantziresearch.com:80/index.asp?section=1, last accessed April 2018.

board structure, compensation/ remuneration, shareholder rights, and audit and risk oversight[15] and has advise on proxy voting at its core. The product portfolios of oekom (now under ISS-oekom) and Vigeo-Eiris are now very diversified, while still including some 'extra' offers which hint at their early focus. Oekom, for example, assesses special environmental issues, such as the eco-efficiency of products and production and the negative screening of fossil fuel and extractive industries, while Vigeo-Eiris offers additional social screens, such as about companies' business ties to Sudan. In addition, Vigeo-Eiris continues to offer CSR consultancy for companies, one of the few rating agents that continue to do so. The company pledges to a strict separation of the consulting and rating business, to avoid potential conflicts of interest.

Finally, the products and services offered by ESG data-vendors offer overall insights into the development of ESG data commercialization. Most of our cases have seen an immense increase in service offerings over time and have moved away from mere data and research offerings towards bespoke analyzes and other kinds of services. Consolidation trends additionally suggest that large data vendors increasingly become generalists, rather than specialists. Still, while the: one-stop shop" logic suggests that each data vendor offers largely the same range of products, this section reveals that ties to original specialties still remain.

DISCUSSION AND CONCLUSIONS

This paper contributes to the qualitative and theoretical understanding of the differences between the data vendors of ESG. By tying six areas of Social Origins to the way in which sustainability, materiality, and specialization is defined within each organization, we are able to explain differences in choices of measures, methodologies, and products and services of

[15] Specific factors include: for board structure (board and board committee composition, board practices, board policies, related party transactions and board controversies), for compensation/remuneration (pay for performance, non-performance based pay, use of equity, equity risk mitigation, non-executive pay, communications and disclosure, termination and controversies), for shareholder rights (one-share one-vote, takeover defences and meeting and voting related issues) and for audit and risk oversight (external auditors).

different data vendors. Additionally, we find patterns across these choices that suggest a differentiation between a normatively, values-driven and a financially, value-driven strategy of data vendors. These differences are strongly influenced by the organization's founders' values and mission, as well as early customer demand and shareholders, and manifest particularly in the articulated mission statement and value-add of the data vendor, its applied definition of materiality, and certain methodological and metrical choices.

The strong influence of founders on the organizational logic of the data vendors speaks to the notion of individuals as carriers of institutional logics (Pache and Santos, 2010; Almandoz, 2014; Fiss and Zajac, 2004). Additional to institutional logics, however, certain cultural inclinations emerge from the way different data vendors measure ESG. For example, data from a French organization being driven by labor-concerns, a German organization relying on a complex set of indicators developed by a German professor, and North American organizations putting special importance on financial materiality. These cultural dispositions may also lead to interesting dynamics between rated companies and their and rating agencies. Given that data vendors have a certain way in which they collect their data, rated companies may react to and receive the same ratings in different ways (DiMaggio and Powell, 1983). In this understanding, rating companies are part of an overall social context to which companies can respond in different ways. In other words, we would expect that a French company would find it easier to understand the context of ratings from Vigeo, and the emphasis they put a labor issues, whereas an American company, coming from a different context with a different understanding of labor conditions, may find it difficult to appreciate this.

Our inquiry has furthermore shed some light on the dynamic of consolidation in the ESG data market. Consolidation is a consequence of ESG data vendors being under market pressure to provide assessments of an ever-larger universe of companies in order to provide users with a high quantity of benchmark possibilities. Mergers of smaller regional data vendors into larger

entities or the acquisition of smaller research firms by larger ones is a logical and visible response to this demand.

Consolidation has not led to an overall convergence of methodologies or a standard for measurement of ESG. On the contrary, while data vendors seek to offer an ever-growing variety of services, they also seek to maintain a unique selling propositions for their products and services which requires custom-made methodologies and novel ways of data collection which are explicitly distinctive in the market. The differences we see in ESG data are therefore a combination of data vendors' Social Origins and the necessity to create a unique profile in a maturing market.

With a few, but increasingly powerful actors in the data market, we may have to expect that ESG will remain a diversified concept, as vendors do not have the incentive to converge. Any attempt at standardization would therefore have to be driven by those actors which use the data, not those that create it. Much discussion is currently led around such standards of non-financial disclosure. While organizations such as the GRI and SASB would argue that these standards already exist, the market and the users of this data – namely the investors – would likely disagree, as they struggle with multiple sources of diverse information. Should standards of non-financial disclosure become mandated by regulators, this would likely still not lead to a standardization of ESG metrics, as aggregation and analytical components would remain individual to each organization. It would, however, allow ESG to be based on the same disclosure information and to have some common standardized key measures and baselines to refer to. In other words, while investors often rely on ESG as a data source for non-financial information, mandated disclosure standards would allow investors to seek comparable information directly from companies and instead make use of ESG as an analytical product, rather than a disclosure product.

Finally, we see this paper as only the beginning to a deeper understanding of diversity in the ESG universe. The patterns we point out in this paper, such as the value- vs. values-based approaches to measuring ESG, offer a new pathway of comparison between data vendors. Questions about how these different data sources are used and integrated, i.e. as in further exploration of the ESG user side (Amel-Zadeh and Serafeim, 2018), and whether their power of predicting financial returns or positive and negative social and environmental impacts varies due to the characteristics we have identified, are therefore yet to be discovered.

Contribution to the Literature on Quantification

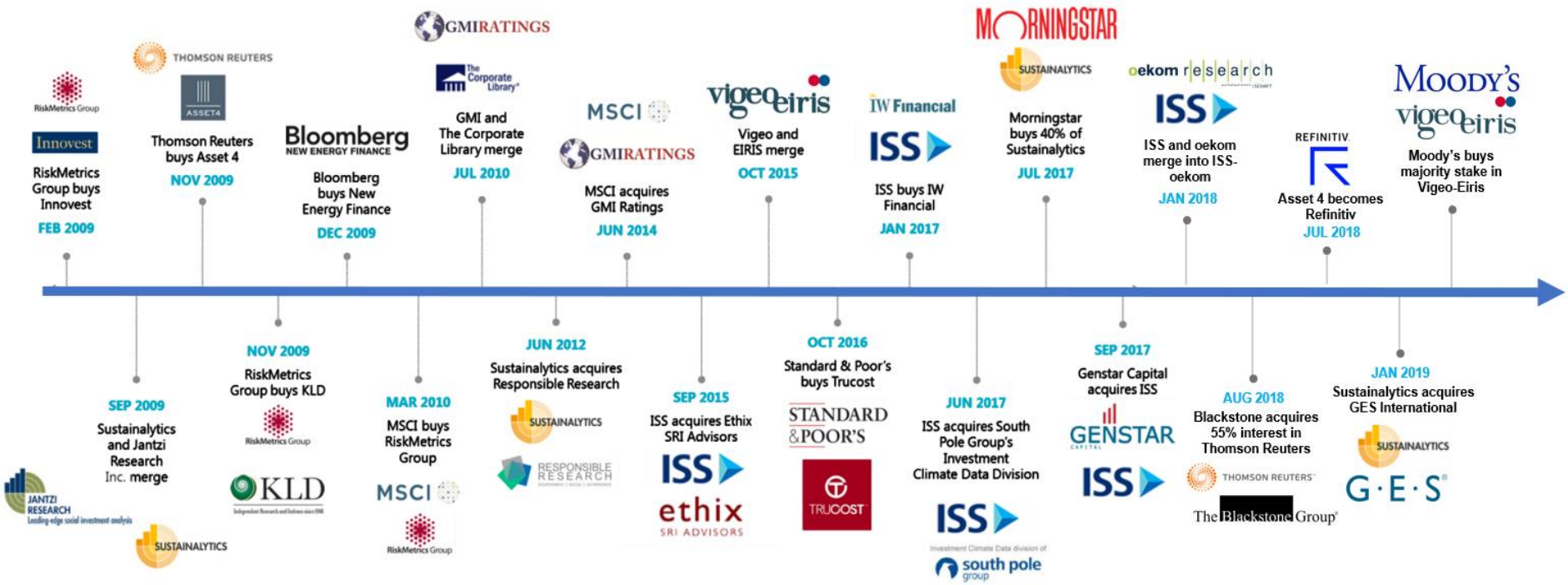
With a view on a sociology of quantification, our findings offer a number of contributions. First, we show that quantified concepts, such as ESG, can adopt duplicate meanings if applied and diffused by a variety of actors at the same time. While the concept of ESG was coined by public institutions, such as the Global Compact and UNEP-FI, it was proliferated by private data vendors and their application of the concept in their products. This proliferation through different organizations allowed for individual interpretations and the emergence of diversity in ESG measurement and conceptualization. In Figure 3.B we show how the process of quantification of one concept can become diversified and be split into different streams of quantifications which create measures under different assumptions and for different purposes. Each of these processes of quantification have a different outcome in measures, methodologies, and products and services which require a different kind of data collection and assembly, invoke diverse mechanisms of authority and discipline, follow different aesthetics, and likely produce a diverse set of reactivities in the market. Whether ESG is defined by a value- or values-oriented strategy, will, for example, have an influence on the way a data vendor collects and aggregates its data (Eccles, Lee, and Stroehle, 2019). Data vendors with the purpose of financial outperformance are interested in the creation of large universes of quantified, industry-weighted information. Data with the purpose to inform normative interests, on the

other hand, is concerned about collecting absolute environmental and social footprints, as well as qualitative and narrative information. Due to these diverse interests, very different methods of data collection are required.

Also, the authority and discipline of ESG varies depending on whether it is created as a value- or values-driven concept. Foucault's (1977) assertion that knowledge is power always relies on the underlying assumption that knowledge can be used for an action that serves a purpose. However, if the purpose of these measures is diverse, it is not imprudent to assume that also the potential power they yield may vary. For example, companies may feel diverse disciplinary influences, depending on whether financial value or environmental and social values are used as the basis for assessment. The task to reconcile these diversities can be a daunting one, particularly for small companies with few resources to spare. This also links to the diverse reactivities which the different conceptualizations and methodologies of ESG create. While the values-driven approach to ESG was important for giving legitimacy and power to moral concerns of investors, it was the financial-value driven methodologies which legitimized ESG as a concept on the wider investment market, vetting it for mainstream investment practice. The increased use of these measures in practice, in turn, lends increased authority to the data vendors and the concept of value-driven ESG itself.

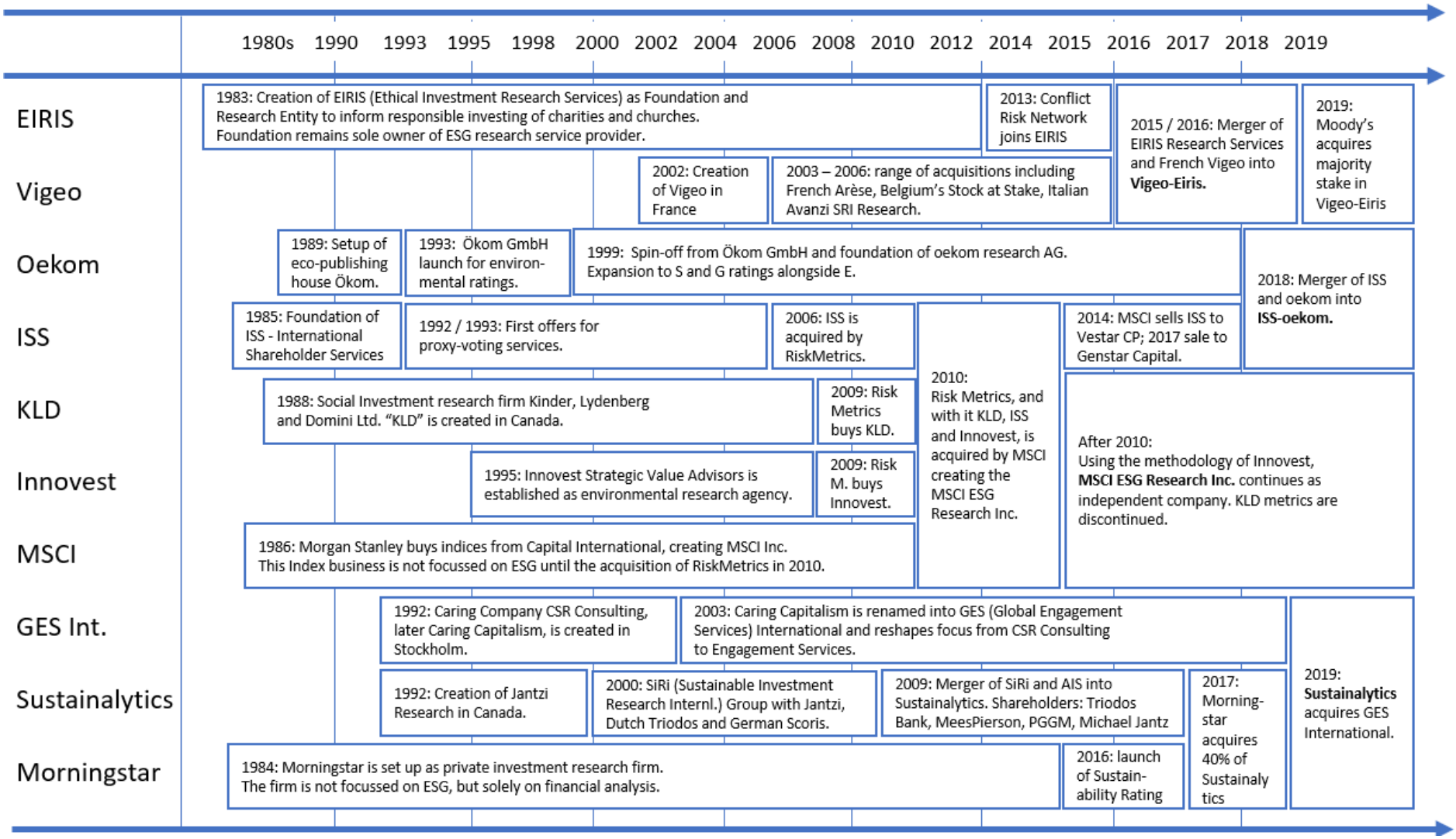
Finally, our findings highlight that quantification can be closely tied to personal characteristics as well as organizational ones. We saw in this paper that the purpose and quantification of ESG varied significantly depending on whether the organization's founders and leaders had a value- or values-driven agenda. The link between individuals' influence and quantified knowledge is therefore particularly important if these individuals influence the organizations through which quantified knowledge is proliferated. In other words, a sociology of quantification that is focused on quantification within organizations therefore should always take into consideration the influence of individuals on this process.

Figure 1: Recent History of ESG Data Vendor Consolidation



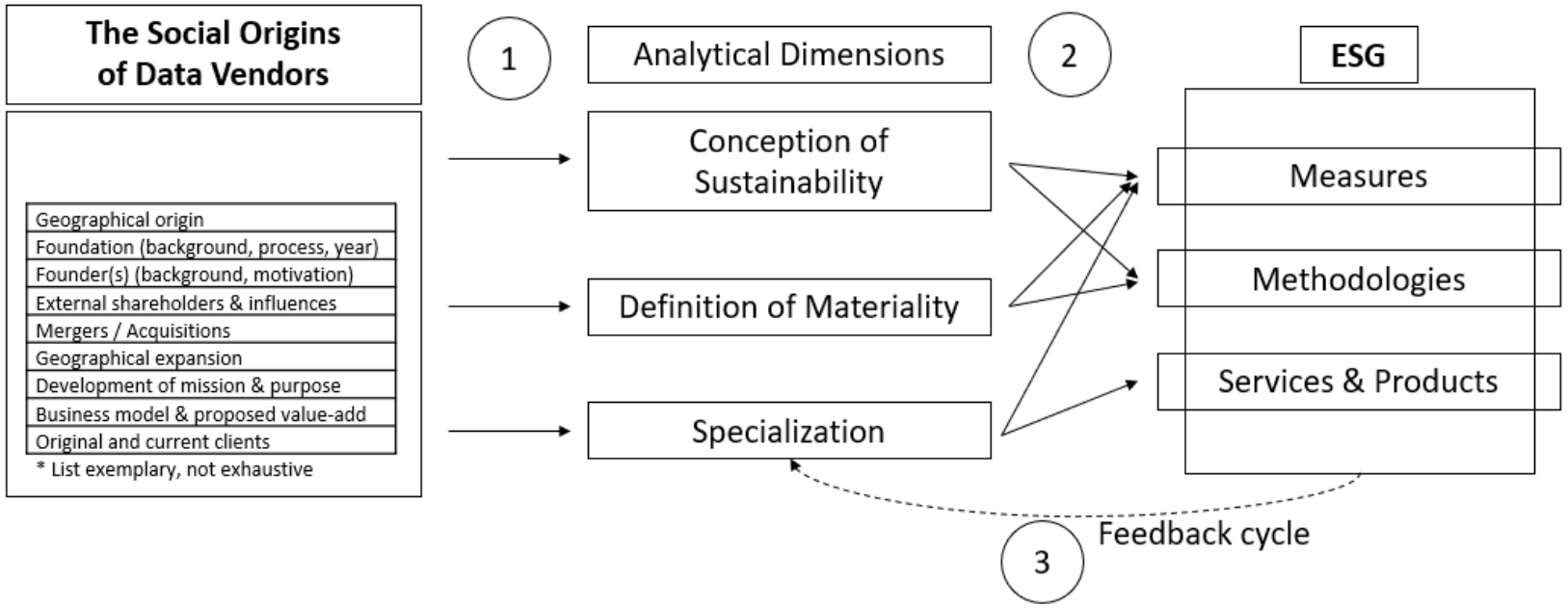
Source: Adapted figure from Brown Flynn (2018): The ESG Ecosystem Understanding the Dynamics of the Sustainability Ratings & Rankings Landscape, p. 6. Last four entries on timeline (starting January 2018) were added by authors to update on latest developments in the ESG ecosystem. Only major events, such as mergers and acquisitions, of major organizations are included in this timeline. All nine case studies are represented in this graph.

Figure 2: Overview of Cases – Corporate History and Establishment.



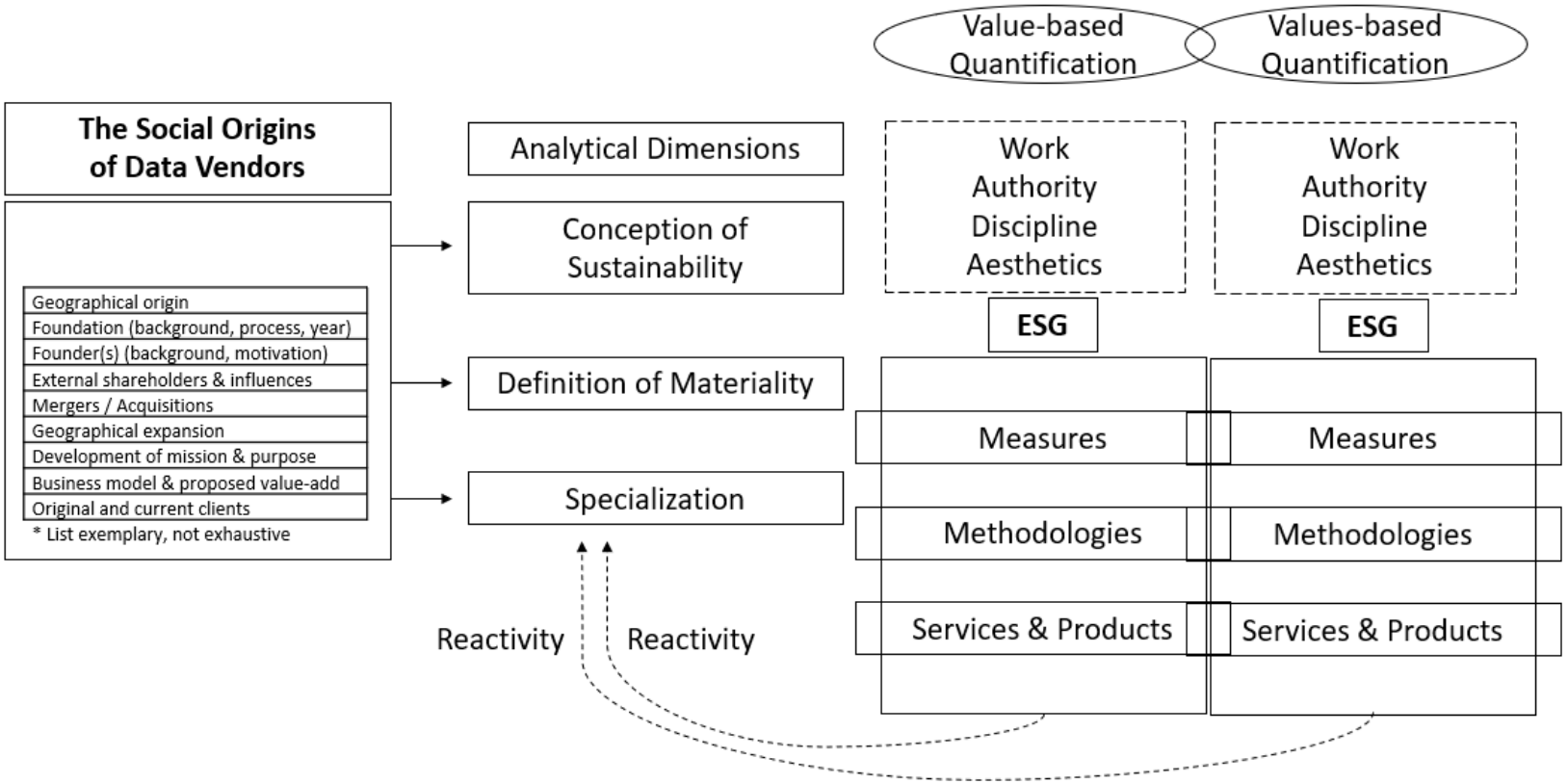
Source: Information pooled from publicly available information on corporate websites, in corporate reports and other public company sources.

Figure 3.A: A Framework to Assess the Social Origins of ESG



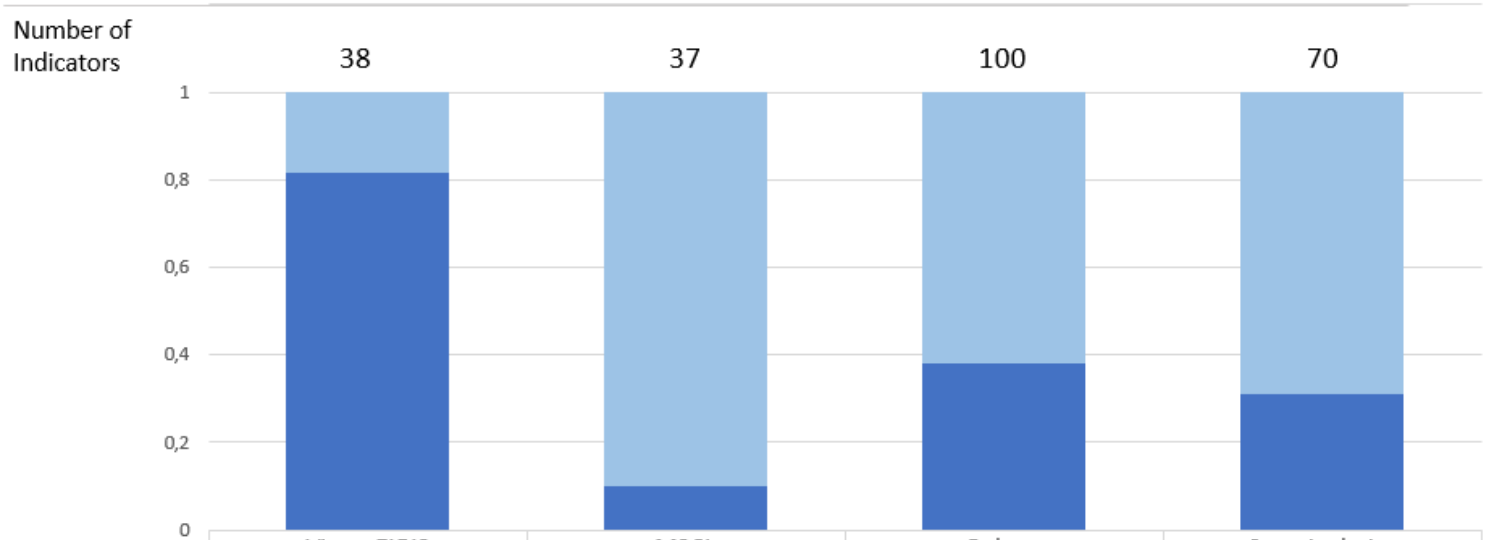
Source: Authors. List of dimensions used to examine Social Origins exemplary, not exhaustive.

Figure 3.B: An adjusted Framework to Assess the Social Origins of ESG



Source: Authors. List of dimensions used to examine Social Origins exemplary, not exhaustive.

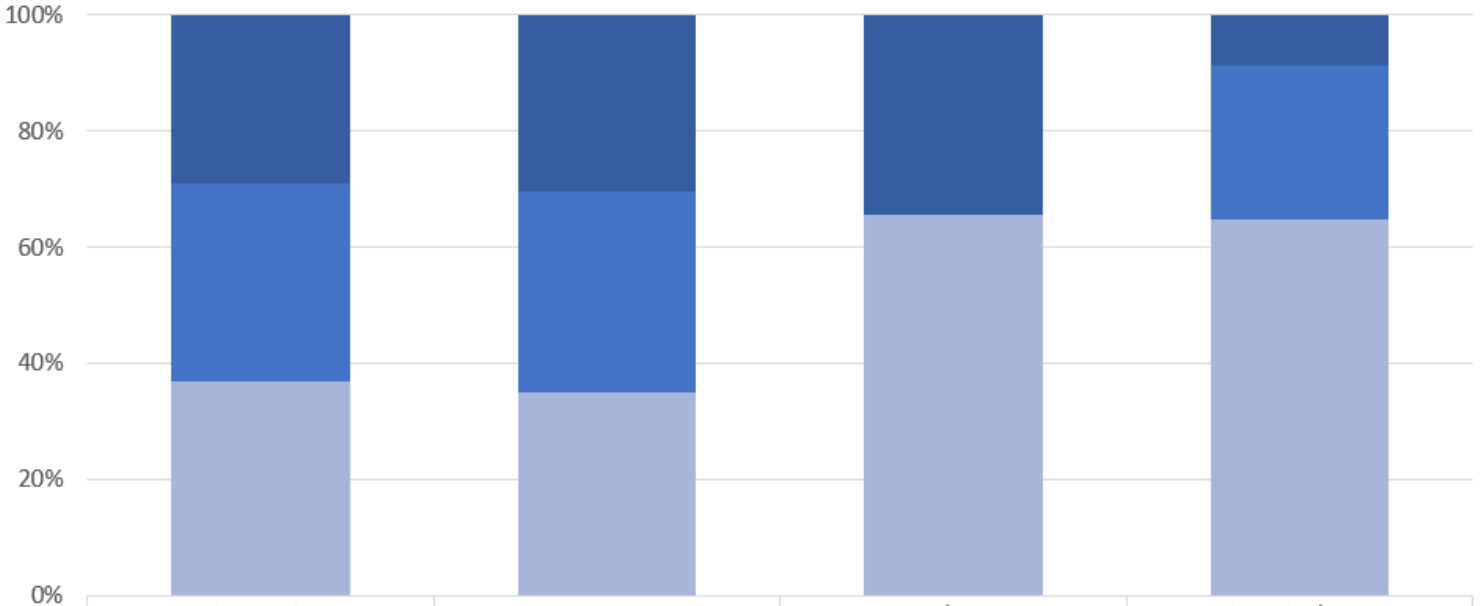
Figure 4: ESG Data Dimensions and Benchmarks.



	Vigeo-EIRIS	MSCI	Oekom	Sustainalytics
Quantitative	0,184	0,9	0,62	0,69
Qualitative	0,816	0,1	0,38	0,31
Rating	-- to ++	AAA to CCC	A+ to D-	0 - 100
Benchmarks	Applying a wide variety of public and international standards	Using industry performance benchmarks	Applying a variety of public and international standards	Using industry performance benchmarks and some public standards.
Values vs. Value-based	**Values-based**	**Value-based**	**Values-based**	**Hybrid**

Source: Information pooled from interviews, publicly available information on corporate websites, in corporate reports and other public company sources. Main sources: official and example company rating reports and official methodology descriptions. Split between Quantitative and Qualitative at MSCI based on estimation after sighting various methodology documents. Vigeo-Eiris and Oekom based on ARISTA certification documents.

Figure 5: ESG Data Distribution.



	Vigeo-EIRIS	MSCI	Oekom	Sustainalytics
E	29%	30%	34%	9%
S	34%	35%		26%
G	37%	35%	66%	65%

Source: Information pooled from interviews, publicly available information on corporate websites, in corporate reports and other public company sources. Main sources: official and example company rating reports and official methodology descriptions. See Appendix B for an excerpt list of consulted documents.

Table 1: List of Interview Partners

Name of Organization (No. of Interviews)	Interview Partners	Time of Interview
Sustainalytics (1)	• Michael Jantzi, Founder Jantzi Research and CEO Sustainalytics	July 2018
Vigeo-Eiris (2)	• Elise Attal, Institutional Affairs Manager Vigeo-Eiris • Fouad Benseddik, Head of Methodology and Institutional Affairs Vigeo-Eiris • Cristina Daverio - Head of ESG Research, Vigeo-Eiris	May 2018 (1.) October 2018 (2.)
MSCI (2)	• Dr Linda-Eling Lee, Managing Director, Global Head of ESG Research	May 2018 (1.) July 2018 (2.)
Innovest (2)	• Hewson Baltzell, Co-Founder Innovest Strategic Value Advisors; CEO of Sorensen Impact Center • Dr Matthew Kiernan, Co-Founder Innovest Strategic Value Advisors; Founder and CEO Inflection Point Capital Management Inc.	July 2019 (Hewson) July 2019 (Matthew)
KLD (2)	• Steve Lydenberg, Co-Founder KLD Research & Analytics, Inc.	May 2018 (1.) July 2019 (2.)
ISS-Oekom (1)	• Matthias Bönning, Managing Director ISS-oekom	June 2018
GES International (1)	• Magnus Furugård, Co-Founder and Chairman GES International • Kerstin Fredriksson, Client Relations Manager GES International	July 2018

Table 2: Overview of Dimensions used to assess the Social Origins of Cases.

Dimension of Assessment	Description	Underlying Informational Content
Geographical origin	Where was the organization founded? Where is the current HQ?	Are there any manifested geographical/ cultural influences?
Foundation	Who founded the organization? Original organizational form?	Founder's impact on and control over organization. Impact due to specific occupational background of founder?
Foundation year	Year of foundation	Age and maturity of organization / time for changes.
External shareholders	Are there external shareholders? If yes are there any majority shareholders, who are they and to what percentage?	Control over business and strategic direction by various entities.
Mergers / acquisitions	Were there any important mergers and acquisitions in the history of this organization?	Critical junctures of organization. Changes in leadership and managerial focus and its influence on core business strategy.
Reason for M&A	If yes, what was the reason for these mergers and acquisitions?	Reason for critical junctures. Voluntary versus hostile changes.
Geographical expansion	How has the organization developed in terms of geographical representation (local offices, etc.)	Has internationalization affected mission and service offers of organization?
Original mission	What was the original motivation to create the organization? What was the mission at the very beginning?	Origin of intent and positioning within value versus values-based spectrum. Original value-add proposition.
Current mission and business model	What is the current mission and business model of the organization?	How does this differ from the original mission (if at all)? Where did this change come from?
First Clients	Who were the first clients of the organization?	How was the product offer driven by early clients and their needs?
Current Clients	Who are the current clients of the organization?	How has this changed? And has this had an influence on the product offered today?
Products	What are the key products of this organization?	Does the organization occupy a niche or is it offering a mainstream assortment of products?
Methodology & Metrics	Which are the key methodologies and metrics (indicators) used to capture ESG?	Categorization, significance of one issue over another through choice / number of indicators, differentiation from other vendors.
Transparency concerning data and methodology	How transparent is this organization with its methodology and data?	How much does the organization see its methodology as key to its value proposition and differentiator on the market?
Rating	Which rating scale does the organization use?	Any obvious parallels to other ratings? Anything unusual about the rating scale?
Data Sources	Which are the data sources used to assess ESG?	Where and how does the organization collect its data from?
Understanding of Materiality	Which understanding of materiality underlies the selection of issues?	An understanding of firm value (financial interest) or firm externality (moral interest / values)?
References made to other programs / Standards?	Which standards and references are used to benchmark the selection of issues?	Does the organization seek legitimacy from official sources?
Current size	What is the current size of the organization in terms?	Size as potential interacting factor of many of the above.

Table 3: Data Vendors by Conception of Sustainability and Materiality

Data Vendor	Conception of Sustainability	Definition of Materiality
KLD	Values-based	Externality / Total Impact
Oekom	Values-based	Externality / Total Impact
GES International	Values-based	Externality / Total Impact
Vigeo	Values-based	Externality / Total Impact
EIRIS	Values-based	Externality / Total Impact
Sustainalytics	Hybrid	Hybrid
Innovest	Value-based	Financial Materiality
MSCI	Value-based	Financial Materiality
Morningstar	Value-based	Financial Materiality
ISS	Value-based	Financial Materiality

Table 4. A Comparison of Product and Service Offerings of ESG Data Vendors

Name of Data-Vendor	Vigeo-Eiris	MSCI-ESG Research	ISS-Oekom	Sustainalytics
Products for Investors				
Management of RI strategies	√	√	√	√
ESG Indices & Ranking	√	√	√	√
Investment & portfolio performance analysis	√	√	√	√
Responsible shareholding (active ownership)	√			
Creation of Investment universes	√		√	√
Custom research services	√	√	√	√
ESG integration & policy development		√	(√)	√
PRI integration services			√	√
Engagement services	√		√	√
Proxy voting services			√	(√)
Fund screening		√		
Company reports	√	√	√	√
Country reports	√		√	√
Emerging Markets Risk Assessment			√	
Technology Solutions			√	√
Products for Companies				
Green bonds / social bonds	√		√	√
CSR evaluation & consultancy	√		(√)	
Labels & attestations	√			
Socio-economic & environmental footprint	√			
Reputational Risk advisory			√	
Negative Screening				
Controversy Risk Assessment	√	√	√	√
Climate Risk Assessments	√	√	√	√
Fossil Fuel & Extractives Screening			√	
Controversial Activities & Weapons	√	√	√	
Sudan Screening	√			
Human rights violation screens			√	√
UNGC adherence	√	√		√
Special considerations				
Sustainable goods and services	√		√	
Prognosis (forward looking analyzes)			√	√
Corporate feedback mechanism		√	(√)	
Expert feedback mechanism		√	√	
References made to public documents	√		√	(√)
Works with public actors (i.e. governments)	√		√	
Works with social actors (NGOs, etc.)	√		√	(√)
Arista 3.0 certified	√		√	(GES)
Other certifications / standards	√		√	√
Examples (former)	ISO 9001, (CSRR-QS)		(CSRR-QS)	(CSRR-QS)

Source: Information taken from the website of each data vendor and may therefore not be exhaustive. The products only reflect what is offered on the first level of visibility on their product websites ("Our Solutions" or "our Services"). Products and services not visibly listed here will not be reflected in this table.

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Appendix A.1. Sustainalytics Indicators

Sustainalytics	Total	Name	ESG Categories	Quant	Qual	E, S or G?
Corporate Governance	6	pillars	Board/Management Quality & Integrity, Board Structure, Ownership & Shareholder Rights, Remuneration, Audit & Financial Reporting, Stakeholder Governance	6	0	G
	73	indicators	Within each pillar 8 - 12 indicators.	73	0	G
Business Ethics	14	indicators	Bribery & Corruption Policy, Bribery & Corruption Programmes, Political Involvement Policy, Whistle-blower Programmes, Lobbying and Political Expenses, Anti-Competitive Practices Category, Accounting and Taxation Category, Bribery and Corruption Category, Business Ethics Category, Intellectual Property Category, Lobbying and Public Policy Category, Sanctions Category, Society - Human Rights Category, Weapons	5	9	S
Human Capital	9	indicators	Freedom of Association Policy, Human Capital Development, Working Conditions Policy, Discrimination Policy, Diversity Programmes, Employee Turnover Rate, Percentage of Temporary Workers, Collective Bargaining Agreements, Labor Relations	8	1	S
Data Privacy and Security	3	indicators	Data Privacy & Security Programme, Data Privacy Policy, Data Privacy and Security	2	1	G
Carbon	11	indicators	Carbon Intensity, CDP Participation, GHG Reduction Programme, Scope of GHG Reporting, Environmental Policy, GHG Risk Management, Environmental Management System, Renewable Energy Programmes, Carbon Intensity Trend, Renewable Energy Use, EMS Certification, Energy Use and GHG Emissions	10	1	E
Product Governance	5	indicators	Eco-Design, QMS Certifications, Product Stewardship Programmes, Marketing Practices Category, Quality and Safety	3	2	G
Human Rights (Supply Chain)	10	indicators	Conflict Minerals Policy, Quality of Social Supplier Standards, Scope of Social Supplier Standards, Conflict Minerals Programmes, Supply Chain Management, Social Supplier Certification, Employees - Human Rights - SC Category, Labor Relations - SC Category, Occupational Health and Safety - SC Category, Society - Human Rights - SC	6	4	S
Total # of Indicators	**58**			**69%**	**31%**	

Appendix A.2. Oekom Indicators

Oekom	Total	Name	ESG Categories	Quant	Qual	E, S or G?
Social & Governance Rating	1	pillar				
Staff and Suppliers	7	indicators	Freedom of association, equal opportunities, health and safety, work-life balance, pay and benefits, employment security/employment types, training and education, suppliers	7	0	SG
Society and Product Responsibility	6	indicators	Society: human rights, community, gov.relations/influence on publ.pol., stakeholder dialogue. Customer and product responsibility: social impact of prod. and services, social aspects along the value chain	6	0	SG
Corporate Governance and Business Ethics	6	indicators	Corporate governance: board independence, shareholder democracy, executive compensation, shareholder structure. Business ethics.	6	0	SG
Environmental Rating	1	pillar		1	0	
Environmental Management	6	indicators	Environmental management, energy management, climate change strategy, water risk and impact, travel and transport, suppliers	6	0	E
Products and Services	7	indicators	Env. impact of products and services, env. aspects along the value chain, product lifecycle, material efficiency, substances of concern, energy efficiency, packaging, take, back and recycling, impacts of outsourced production	7	0	E
Eco-efficiency	4	indicators	Energy efficiency, GHG intensity, water efficiency, waste intensity	4	0	E
Controversial social business practices	13	indicators	Human Rights Controversies: Company, Supplier, Financiers. Labor Rights Controversies: Company: Freedom of association, forced labor, Child labor, Discrimination, Other areas, Supplier: Freedom of association, forced labor, child labor, discrimination, other areas	0	13	S
Controversial Environmental Practices	3	indicators	Environmental practice: Company, Supplier, Financier	0	3	E
Business Malpractice	6	indicators	Business Malpractice: Company: Corruption, Financial accounting, Competition, Taxes, Money transfers, Other/Miscellaneous	0	6	G
Controversial Business areas	39	yes/no	Broader categories: Alcohol, Animal testing, Chlorinated Hydrocarbons, Embryonic research, fossil fuels, furs, gambling, GMOS, Military, Nuclear, Pesticides, Pornography, Tobacco	binary	binary	
Total # of Indicators	**58**			**62%**	**38%**	

Appendix A.3. MSCI Indicators

MSCI	Total	Name	ESG Categories	Quant	Qual	E, S or G?
Environment	n/a	Pillar		n/a	n/a	
Climate Change	4	Theme	Carbon Emissions, Product Carbon Footprint, Financing Environmental Impact, Climate Change Vulnerability	4	n/a	E
Natural Resources	3	Theme	Water Stress, Biodiversity & Land Use, Raw Material Sourcing	3	n/a	E
Pollution & Waste	3	Theme	Toxic Emissions & Waste, Packaging Material & Waste, Electronic Waste	3	n/a	E
Environmental Opportunities	3	Theme	Opportunities in Clean Tech, Opportunities in Green Building, Opp's in Renewable Energy	3	n/a	E
Social	n/a	Pillar		n/a	n/a	
Human Capital	4	Theme	Labor Management, Health & Safety, Human Capital Development, Supply Chain Labor Standards	4	n/a	S
Product Liability	6	Theme	Product Safety & Quality, Chemical Safety, Financial Product Safety, Privacy & Data Security, Responsible Investment, Health & Demographic Risk	6	n/a	S
Stakeholder Opposition	1	Theme	Controversial Sourcing	1	n/a	S
Social Opportunities	4	Theme	Access to Communications, Access to Finance, Access to Health Care, Opp's in Nutrition & Health	4	n/a	S
Governance	n/a	Pillar		n/a	n/a	
Corporate Governance	4	Theme	Board, Pay, Ownership, Accounting	4	n/a	G
Corporate Behavior	5	Theme	Business Ethics, Anti-Competitive Practices, Tax Transparency, Corruption & Instability, Financial System Instability	5	n/a	G
Total # of Indicators	**37**			**100%**	**0%**	

Appendix A.4. Vigeo-Eiris Indicators

Oekom	Total	Name	ESG Categories	E, S or G?
Corporate Governance	4	Issue	Board of Directors, Audit& Internal Controls, Shareholders, Executive Remuneration	G
Customer/product responsibility	3	Issue	Product safety, Information to customers, Responsible customer relations	G
Environment	11	Issue	Environmental strategy and eco-design, Pollution prevention and control (soil, accident), Development of green products and services, Pro-tection of biodiversity, Protection of water resources, Minimizing environmental impacts from energy use, Management of atmospheric emissions, Waste management, Management of local pollution, Management of environmental impacts from transportation, Management of environmental impacts from the use and disposal of products/services	E
Health and safety	1	Issue	Improvement of health and safety conditions, including Stress at work	S
Human Rights	6	Issue	Respect for human rights standards and preventions of violations, Respect for freedom of association and the right to collective bargaining, Non-Discrimination, Elimination of forced labor and child labor	S
Labor practices and decent work:	6	Issue	Promotion of labor relations, Encouraging employee participation, Responsible management of restructurings, Career management and promotion of employability, Quality of remuneration systems, Respect and management of working hours	S
Social, Environmental, Ethical	4	Issue	Reputation, Operational efficiency, Human capital, Legal security	Other
Supply chain responsibility	3	Issue	Sustainable relations with suppliers, Integration of environmental factors in the supply chain, Integration of social factors in the supply chain	G
Total # of Indicators	**38**			

Source: No information on quantitative vs qualitative indicators in methodology description. Information gathered from Arista certification documentation.