Unpacking the ESG ratings: Does one size fit all? *

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Abstract

As ESG investing goes mainstream, investors increasingly rely on ESG ratings when making investment decisions. This study aims to delve into the overall ESG ratings provided by four prominent ESG data providers, focusing on their accounting methodologies, the relevance of the three pillars (environment, social, and governance), and the key performance indicators (KPIs) that drive these ratings. By examining a sample of European and UK companies, we question the significance of the governance and social pillars in explaining the overall ESG scores. Our findings highlight a subset of indicators that exhibit the highest correlation with ESG scores, including the presence of external audits, an environmental supply chain policy, and target emissions. This letter contributes to the ongoing ESG credibility debate and emphasizes the need for further transparency of ESG ratings.

Keywords: Environmental, social, and governance factors (ESG); credit risk; debt cost; equity cost; sovereign bonds; portfolio management

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1 Introduction

In recent decades, increasing awareness of ESG (Environmental, Social, and Governance) issues has influenced public opinion and prompted governments and firms to integrate ESG dimensions into their decisions. This has led to the rise of specialized ESG rating agencies, and traditional rating agencies incorporating ESG aspects into their analyses. The demand for sustainable financial instruments has been fueled by both investor-based interest and growing public and regulatory concern over climate change. ESG ratings are now widely discussed in the financial press, policy debates, and academic research, particularly in shaping the investment decisions of institutional investors.

Numerous studies have documented the impact of ESG ratings on investor behavior. To illustrate, Rzeźnik et al. (2021) conducted a study that demonstrated how the inversion of the Sustainalytics rating scale caused certain investors to misinterpret the fluctuations in ESG ratings, resulting in inaccurate decisions regarding the purchase or sale of stocks. Another study by Berg et al. (2022) examined the effect of ESG rating changes on mutual fund holdings, stock returns, and corporate investments, finding that an ESG downgrade led to negative and long-term stock returns.

However, persistent issues remain with ESG ratings, including the lack of standardized methodologies among different raters, leading to confusion and potentially greenwashing. A study by Berg et al. (2019) identified that measurement contributes to 56% of the rating divergence, scope contributes to 38%, and weight contributes to 6%. The measurement divergence is driven by a rater effect, where the overall impression of a firm influences the measurement of certain ESG categories. ESG rating disagreement is also associated with higher stock return volatility, larger price movements Christensen et al. (2021), and uncertainty in the capital markets Kimbrough et al. (2022).

In response to the unsatisfactory state of the current ESG rating ecosystem, there have been proposals for regulation and increased transparency. The Financial Markets Standards Board and the European Securities and Markets Authority have published reports and engaged in consultations to improve the transparency and comparability of ESG ratings. However, while there is ample evidence of the impact of ESG ratings on

investor behavior and financial markets, no study has explored the potential conflicts arising from rating divergence for firms.

Firm managers have incentives to improve ESG ratings and reduce disagreement between rating agencies to attract institutional investors and reduce their cost of capital. However, conflicting assessments of a firm's Environmental, Social, and Governance performance may create confusion and different rates of substitution between the pillars based on varying measurement and weighting strategies. This can dilute managers' incentives to improve ESG practices and result in cherry-picking areas for improvement.

To address these issues, we aim to unpack the lack of standardization in ESG ratings, discuss the potential trade-offs, and examine the main drivers behind these ratings. We perform Pearson correlations and intra-correlations for each rating agency, finding significant variations in accounting methodologies. RobecoSAM shows high correlation and intra-correlation, indicating uniform ratings across ESG and its pillars due to its reliance on survey data. In contrast, Bloomberg, Refinitiv, and Sustainalytics exhibit lower intra-correlation, highlighting the lack of uniform methodology and creating challenges for firm managers in prioritizing ESG improvements.

2 One size does not fit all. The problem with ESG Ratings methodologies

One key aspect of this letter is the construction of a comprehensive "ESG database" that collects high-quality and sufficiently long time series, our dataset consists of monthly ESG data from Sustainalytics, RobecoSAM, Refinitiv and Bloomberg for listed firms in the 27 EU countries and the United Kingdom. Our time series ranges from 2002 to 2020 and contains ESG ratings as well as ESG KPIs that are synthesized by rating agencies. Table 1 describes the rating scales and source material used by the four ESG rating agencies in our sample. Typically, Sustainalytics measures firms ESG performance using an ESG risk score, this is an inverted scale in which 0 represents the least risk (best in class) and 100 represents high risk (worst in class) but in order to make all ratings

comparable we use the Sustainalytics rank where firms' are ranked based on their ESG behavior from 0 (worst in class) to 100 (Best in class). As seen in column 3 of Table 1 the approaches used by Sustainalytics, Bloomberg and Refinitiv are all similar as they depend on publicly available information. However, Bloomberg also makes direct contact with the firm in order to formulate their rating. RobecoSAM is the outlier in our sample as they depend solely on survey data. Despite the fact rating agencies appear to be using similar source material, often the ways in which it is processed can subsequently lead to vastly different as documented by Berg et al. (2019).

Table 2 provides the descriptive statistics for the four rating agencies in our sample on a yearly basis from 2016 to 2020. In our sample Refinitiv provides ratings beginning from 2002 however in order to perform a comparative analysis we examine from 2016 onwards. The first observation that is evident is that all four rating agency across all pillars (Environmental, Social and Governance) increases their firm coverage over time, this is unsurprising given the increasing demand for ESG information. Refinitiv has the most comprehensive coverage in our sample providing 1862 EU firms ESG ratings in 2020, whist RobecoSAM, Sustainalytics and Bloomberg have a coverage of 1023, 630 and 229 firms respectfully. We use a sub-sample of our data and perform descriptive statistics for firms that have E, S and G ratings from all four raters. The results are displayed in Table 3, as we can see that compared to table 2 the mean ESG ratings across all agencies becomes closer in magnitude. Sustainalytics still has the highest mean ESG rating every year, whilst Bloomberg is still the lowest across all dimensions. Interestingly the Governance pillar for Refinitiv, RobecoSAM and Sustainalytics has the lowest mean rating compared to their Environmental and Social pillars, however Bloomberg's mean Governance rating is the highest of all it's pillars. This points to several possible issues, first rating agencies are not providing uniform firm ratings, second this discrepancy is persistent across every pillar, and third this is producing differing marginal rates of substitution between the pillars depending on the rating agency.

2.1 Intra-correlations between E,S,G, and ESG ratings

To unpack the accounting methodologies of the rating agencies we investigate the correlations between the ESG pillar and the individual E, S, and G pillars. Furthermore we examine the intra-correlations between the E-S-G pillars and the distributions of the ratings. Figure 1 displays the correlation/intra-correlation for Bloomberg, the dispersion of the rating correlation (as demonstrated by the scatter plots), and the distribution of the ratings. Interestingly, we find a strong correlation of 0.83 between the Bloomberg ESG rating and its Environmental rating. However, this correlation decreases to 0.64 and 0.31 for the Social and Governance pillars, respectively. Upon further analysis of the intra-correlations, we uncover even weaker connections between the Governance and Environmental pillars, as well as between the Governance and Social pillars, with correlation coefficients of 0.17 and 0.06. These findings suggest an absence of substantial relationship between these specific ESG pillars. By examining the dispersion of these correlations we see that the low Governance intra-correlations appears to be concentrated in the lowest Environmental and Social ratings. Further we look to the distributions of scores. Noticeably, the ESG ratings appear to be approximately normally distributed, with Social and Environmental skewed considerably to the left, indicating that the majority of firms in our Bloomberg sample have environmental and social performance less than 5. Whilst the distribution for Governance is skewed to the right indicating firms receiving favorable Governance rating.

Figure 2 repeats the same exercise for Refinitiv. Evidently the correlations and intra-correlations are greater than Bloomberg, although the intra-correlation between the Governance pillar and the Environmental & Social are still considerably low at 0.39 and 0.43. However unlike Bloomberg the correlation between Social and Environmental is substantially higher at 0.73, this indicates a tendency for Refinitiv to link strong performance in the Environmental category with a correspondingly high Social score. By observing the scatter plots, we can see that the low intra-correlations for Governance appear to be present as every level of Environmental and Social ratings. Similarly to Bloomberg, we see that ESG ratings appear to be normally distributed, whilst Social

and Governance are moderately skewed to the left and the right respectfully. However, the distribution for Environmental scores is heavily skewed to the left indicating that the majority of firms are being rated below 50 in their environmental performance. Thus it appears that the poor Environmental performance is being offset by higher Governance scores.

In contrast to Bloomberg and Refinitiv, the correlations and intra-correlations presented in Figure 3 for RobecoSAM exhibit notably high values. This suggests the possibility of distinct accounting methodologies, where a company considered good or bad in one pillar by RobecoSAM tends to be evaluated similarly in all other pillars. However, upon examining the score distribution, we observe a more uniform spread with a notable concentration at the highest rating across all dimensions.

Figure 4 depicts the correlations and intra-correlations for Sustainalytics. We can see that the correlation between ESG and all individual pillars is high, with the lowest correlation coming from the Social pillar at 0.76. However similar to Bloomberg and Refinitiv these correlations drop once we observe the intra-correlation of the pillars, in particular the lowest correlation of 0.55 is between Governance and Social. As we can see from the distributions of the scores, all Sustainalytics scores are skewed to the right, indicating that they favorably rate firms.

To gain insight into how these intra-correlations may impact the marginal rate of substitution between ESG pillars and shape managers' ESG behavior, we observe the example depicted in Table 4. Table 4 depicts the ESG ratings for a transportation company in 2021. If a manager was seeking to improve their ESG ratings based on these scores, it is unclear which dimension requires improvement. According to RobecoSAM the firm already performs well and only requires marginal enhancements across all ESG areas, however by just observing Refinitiv or Bloomberg scores the manager should focus greater attention on improving the Governance or social aspects of the firm respectively. Whilst Sustainalytics would incentivise a manager to improve both. Thus different rating agencies are providing vastly different incentives to firm managers, potentially

hindering the path to overall ESG improvement.

Thus these correlations, intra-correlations and rating distribution point to vastly different accounting methodologies used by the different rating firms. RobecoSAM whos source material is solely reliant on survey data provided by the firms, seems to provide uniform ratings across ESG and its pillars. However Bloomberg, Refinitiv and Sustainalytics methodology to seem to point to separate and uncorrelated governance, social and environmental pillars. This can create a problem of different marginal rates of substitution between the different pillars for firm managers depending on the rating agency.

2.2 How does the divergence evolve over time?

Figures 5-7 show the rating disagreement for each pillar along a yearly basis from 2016 to 2020. All ratings are standardised and sorted using the Refinitiv's score as a reference. Figure 5-7 depicts the dispersion around Refinitiv being driven by all raters, however with the majority of the outliers for figure 5 & 6 belong to Bloomberg. Whilst in Figure 7, the disagreement of the governance pillar appears to be primarily driven by RobecoSAM. These findings suggest that Bloomberg's assessment methodology may have a significant influence on the observed discrepancies.

Figure 8 shows the average standard deviation of ESG, Environmental, Social and Governance for 394 firms which having a rating from all rating providers ranging from 2016 to 2020. Immediately it is evident that Governance has the highest average standard deviation of all dimensions, followed by Social, Environmental and then the cumulative ESG dimension. All four appear to experience a sharp decrease in average standard deviation between 2016 and 2017. This points to the disagreeance amongst raters being largely driven by the Governance pillar.

3 Drivers of ESG ratings

Given the confusion faced by firms over how to improve their ESG ratings we look to the indicators that are most correlated to ESG scores. Figure 9 shows the Pearson's correlation between the RobecoSAM, Sustainalytics and Refinitiv ESG ratings and the KPI's with the highest correlation. Sustainalytics and Refinitiv demonstrate a higher correlation to the KPI's than RobecoSAM, possibly due to the source material used. Evidently having a "CSR Sustainability External Report" is the most correlated having a high ESG score, this could indicate that rating agencies value external sustainability auditing or that firms with high ESG ratings seek to validate this through an external audit. Beyond this Sustainalytics and Refinitiv are also highly correlated to "Environmental Supply Chain Management", "Incentives for individual management of climate change" and "Climate change commercial risks". In general RobecoSAM is less correlated to the KPI's but still relevant was "UN Global Combat Signatory", "GRI Report Guidelines" and "Policy Environmental Supply Chain". Thus indicating that depending on which rating a firm would like to improve different steps could be taken.

4 Conclusion

Existing literature on ESG ratings has primarily focused on their impact on investor behavior and financial markets. However, there is a lack of studies examining the effect of rating divergence on manager incentives. In this letter, we delve into the ESG ratings provided by four prominent EU data providers (Sustainalytics, Refinitiv, RobecoSAM, and Bloomberg) and analyze their individual pillars.

Using Pearson correlations and intra-correlations, we investigate the correlation between ESG and its pillars, as well as the intra-correlation among the pillars. Our findings reveal significant variations in accounting methodologies employed by the rating agencies. RobecoSAM exhibits high correlation and intra-correlation, suggesting uniform ratings across ESG and its pillars, primarily based on survey data. Conversely,

Bloomberg, Refinitiv, and Sustainalytics demonstrate lower intra-correlation, indicating a lack of uniform methodology. This discrepancy creates challenges for firm managers due to different rates of substitution between the pillars.

Additionally, we analyze the average standard deviation of the pillars for firms with multiple ratings over time. Governance consistently displays the highest standard deviation, followed by Social, indicating that these pillars contribute to the most confusion for firms. Furthermore, our exploration of the main drivers of ESG ratings reveals that having an external auditor improves ratings across all agencies.

The results of this study contribute to the ongoing ESG-credibility debate and emphasize the need for a better understanding of the three pillars. Conflicting assessments of a firm's Environmental, Social, and Governance performance can lead to confusion beyond the financial markets, potentially misleading firm managers regarding the areas requiring improvement.

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Table 1: Overview of ESG rating agencies

Data Provider	Rating scale	Sources
Sustainalytics	0 - 100	Public disclosure, Media and news NGO reports
Bloomberg	0 - 10	Company reports, Publicly available information, Firm direct contact
RobecoSAM	0 - 100	Survey approach
Refinitiv	0 - 100	Company websites, Company reports, NGO Websites, Media and news Stock Exchange filings

Table 2: Descriptive statistics for the intra-correlation analysis

		Bloomberg						Refinitiv						RobecoSAM						Sustainalytics					
		# firms	mean	std	25%	50%	75%	# firms	mean	std	25%	50%	75%	# firms	mean	std	25%	50%	75%	# firms	mean	std	25%	50%	75%
	year																								
ESG	2016	181	3,73	1,13	2,93	3,76	4,46	1067	52,84	20,18	37,90	53,98	68,54	416	68,08	25,20	50,75	74,50	90,00	438	73,67	25,03	60,29	82,61	92,86
	2017	213	3,90	1,11	3,14	3,98	4,65	1160	53,88	20,04	40,70	55,23	69,45	643	57,75	29,10	34,00	58,00	85,00	452	72,97	24,97	59,23	81,08	92,62
	2018	221	4,01	1,15	3,21	4,06	4,81	1571	51,73	20,80	36,08	52,60	68,02	810	48,93	30,10	23,00	46,00	77,00	505	72,66	24,71	59,26	79,79	92,50
	2019	225	4,19	1,18	3,38	4,21	5,08	1736	51,83	20,79	36,14	53,00	67,86	982	45,85	29,44	21,00	42,00	70,00	593	69,93	25,14	53,85	76,06	91,21
	2020	229	4,31	1,19	3,42	4,31	5,10	1862	51,24	21,20	34,83	52,85	67,97	1023	46,57	29,58	21,00	43,00	73,00	630	69,94	24,74	53,14	75,29	91,05
Environmental	2016	748	2,23	1,87	0,55	1,98	3,41	1067	48,89	28,09	24,53	50,51	73,99	416	67,69	25,06	50,75	73,00	89,00	438	70,49	25,45	55,00	78,68	90,91
	2017	769	2,46	1,91	0,76	2,17	3,80	1160	48,53	28,15	24,52	50,05	72,54	643	58,34	28,13	36,00	59,00	84,00	452	69,82	25,40	53,33	77,03	91,08
	2018	782	2,68	1,98	0,97	2,46	4,03	1571	44,57	28,20	20,77	43,34	68,21	810	51,02	28,73	27,00	49,00	76,00	505	69,22	25,16	51,16	75,82	90,63
	2019	786	2,95	2,02	1,28	2,79	4,38	1736	45,37	27,98	22,78	44,90	69,53	982	48,41	28,10	25,00	44,00	70,00	593	66,91	25,00	48,89	71,53	88,67
	2020	788	3,26	1,99	1,79	3,14	4,72	1862	44,36	28,08	20,61	44,35	67,72	1023	49,66	28,17	26,00	47,00	73,00	630	67,09	24,97	48,32	72,71	88,35
Social	2016	748	2,30	1,66	1,06	1,81	3,17	1067	56,93	23,04	39,86	57,17	75,89	416	67,53	26,54	49,75	74,00	90,00	438	68,56	27,40	53,57	76,92	90,77
	2017	769	2,59	1,73	1,28	2,10	3,45	1160	59,49	22,16	45,25	61,19	77,01	643	55,87	31,10	28,00	58,00	85,00	452	67,77	27,07	50,00	76,00	90,48
	2018	782	2,76	1,74	1,45	2,34	3,68	1571	57,24	22,50	40,19	58,56	75,41	810	46,02	31,62	18,00	39,00	76,00	505	68,33	26,93	50,00	75,82	91,30
	2019	786	2,94	1,79	1,57	2,54	3,99	1736	56,86	22,77	39,57	58,39	75,39	982	42,83	30,45	16,00	36,00	69,00	593	65,97	27,40	46,43	72,97	89,84
	2020	788	3,16	1,86	1,68	2,80	4,31	1862	55,12	23,63	36,92	56,70	74,94	1023	43,99	30,34	17,00	39,00	71,00	630	65,74	26,69	48,25	70,82	88,59
Governance	2016	748	5,62	1,47	4,56	5,71	6,75	1067	49,58	22,84	31,05	50,85	67,56	416	67,46	25,06	50,00	73,50	89,00	396	72,55	25,31	58,54	81,03	92,33
	2017	769	5,79	1,39	4,87	5,87	6,85	1160	49,80	22,99	31,38	50,20	67,90	643	58,26	27,93	36,00	58,00	84,00	409	72,21	25,17	58,07	79,73	92,59
	2018	781	5,91	1,37	4,97	5,97	6,89	1571	49,52	23,59	30,34	50,48	68,94	810	50,27	28,74	26,00	47,00	76,00	461	71,82	25,26	56,48	79,17	92,31
	2019	786	6,11	1,32	5,19	6,19	7,09	1736	49,77	23,58	30,75	50,22	68,94	982	47,37	28,23	24,00	43,00	70,00	531	69,60	25,64	53,57	76,22	91,21
	2020	788	6,29	1,32	5,40	6,34	7,31	1862	50,90	23,55	31,43	51,42	70,47	1023	47,96	28,48	24,00	44,00	72,00	562	69,63	24,92	52,77	75,29	90,29

Table 3: Descriptive statistics of the overlap sample.

		Bloomberg						Refinitiv						RobecoSAM						Sustainalytics					
	year	**count**	**mean**	**std**	**25%**	**50%**	**75%**	**count**	**mean**	**std**	**25%**	**50%**	**75%**	**count**	**mean**	**std**	**25%**	**50%**	**75%**	**count**	**mean**	**std**	**25%**	**50%**	**75%**
ESG	**2016**	71	4,03	0,95	3,40	3,96	4,50	253	67,53	15,40	59,92	69,36	78,72	253	69,96	25,51	50,00	78,00	92,00	253	78,13	21,89	68,49	85,02	94,27
	2017	92	4,21	1,01	3,47	4,11	4,74	309	65,39	16,30	56,68	67,73	77,50	309	63,60	27,12	41,00	65,00	89,75	309	74,36	24,09	60,60	81,14	93,31
	2018	103	4,27	1,04	3,62	4,28	4,85	342	66,36	15,93	57,48	69,18	77,75	342	60,98	27,50	38,00	59,63	86,92	342	74,01	24,38	60,03	82,51	94,07
	2019	105	4,40	1,04	3,67	4,51	4,91	356	68,25	15,54	60,23	71,59	79,36	356	59,65	27,33	36,92	58,92	85,54	356	74,16	23,18	59,85	81,15	93,23
	2020	116	4,60	1,04	3,92	4,67	5,21	381	70,18	14,28	63,72	72,81	80,22	381	61,34	26,95	39,83	61,67	87,00	381	74,71	22,48	60,76	80,93	93,27
Environmental	**2016**	253	2,84	2,03	1,25	2,53	4,26	253	67,18	21,23	55,54	72,04	83,88	253	70,04	24,93	53,00	77,00	91,00	253	74,98	22,66	65,51	80,94	92,76
	2017	309	2,86	2,06	1,19	2,67	4,28	309	64,99	22,30	53,14	69,80	83,00	309	64,34	26,24	44,50	67,75	89,00	309	71,27	24,42	55,09	76,93	92,45
	2018	342	3,05	2,10	1,38	3,00	4,55	342	65,77	22,09	53,25	70,56	82,18	342	62,32	26,36	43,17	62,88	85,92	342	70,40	24,89	53,39	77,19	91,60
	2019	356	3,20	2,13	1,50	3,18	4,68	356	66,27	22,40	53,09	70,42	84,05	356	61,11	26,36	40,00	62,13	85,67	356	71,39	23,02	57,23	77,22	91,10
	2020	381	3,52	2,10	1,90	3,69	5,08	381	68,09	21,05	55,95	72,90	84,32	381	62,93	26,27	41,00	66,00	86,00	381	72,06	22,87	55,87	77,75	91,00
Social	**2016**	253	2,44	1,56	1,34	2,08	3,11	253	72,36	17,88	62,93	75,79	85,53	253	69,02	25,73	50,00	77,00	90,00	253	76,58	21,39	65,36	83,38	93,77
	2017	309	2,60	1,64	1,42	2,19	3,32	309	70,77	18,70	58,91	74,05	85,33	309	63,33	26,77	42,25	65,25	88,00	309	73,78	23,42	60,16	79,10	93,57
	2018	342	2,77	1,68	1,51	2,41	3,58	342	71,79	17,91	60,86	75,00	85,44	342	61,13	26,69	40,00	60,71	87,33	342	73,47	23,51	58,29	80,28	92,89
	2019	356	2,88	1,68	1,66	2,49	3,67	356	73,23	17,23	64,77	75,90	86,15	356	59,88	26,49	38,00	59,75	85,75	356	73,22	23,39	60,92	79,18	91,76
	2020	381	3,10	1,71	1,85	2,75	4,03	381	74,97	16,32	65,86	78,57	87,04	381	61,56	26,15	40,50	62,50	86,33	381	73,73	22,63	60,48	80,05	91,54
Governance	**2016**	253	5,99	1,32	4,92	6,18	7,02	253	59,95	20,78	45,54	62,82	77,34	253	69,00	26,93	47,00	80,00	91,00	253	72,29	26,07	59,09	79,25	93,03
	2017	309	5,99	1,30	5,05	6,09	7,13	309	56,71	21,84	41,66	59,42	74,29	309	61,28	29,37	36,00	62,50	89,50	309	68,22	26,63	52,72	76,56	90,34
	2018	342	6,03	1,24	5,22	6,08	6,94	342	58,14	21,39	42,06	61,40	75,35	342	57,87	29,71	32,67	58,00	87,58	342	68,89	26,80	50,62	76,57	91,80
	2019	356	6,10	1,23	5,29	6,07	6,87	356	61,89	20,27	48,68	65,64	77,31	356	56,66	29,25	32,65	54,83	85,08	356	68,89	25,96	51,33	76,26	90,88
	2020	381	6,30	1,17	5,58	6,24	7,09	381	64,47	19,24	52,85	67,12	79,35	381	58,69	28,76	37,00	58,00	87,17	381	69,27	24,80	53,94	75,72	90,26

Table 4: ESG ratings for Entertainment company Bollore in 2021

Pillar	Sustainalytics	Bloomberg	RobecoSAM	Refinitv
ESG	11	Na	85	57
Environmental	65	4	90	73
Social	1	1	85	76
Governance	2	5	84	28

5 List of Figures

Figure 1: Intra-correlation between Environmental, Social, Governance and ESG score as provided by Bloomberg for a sample of 799 European compananies

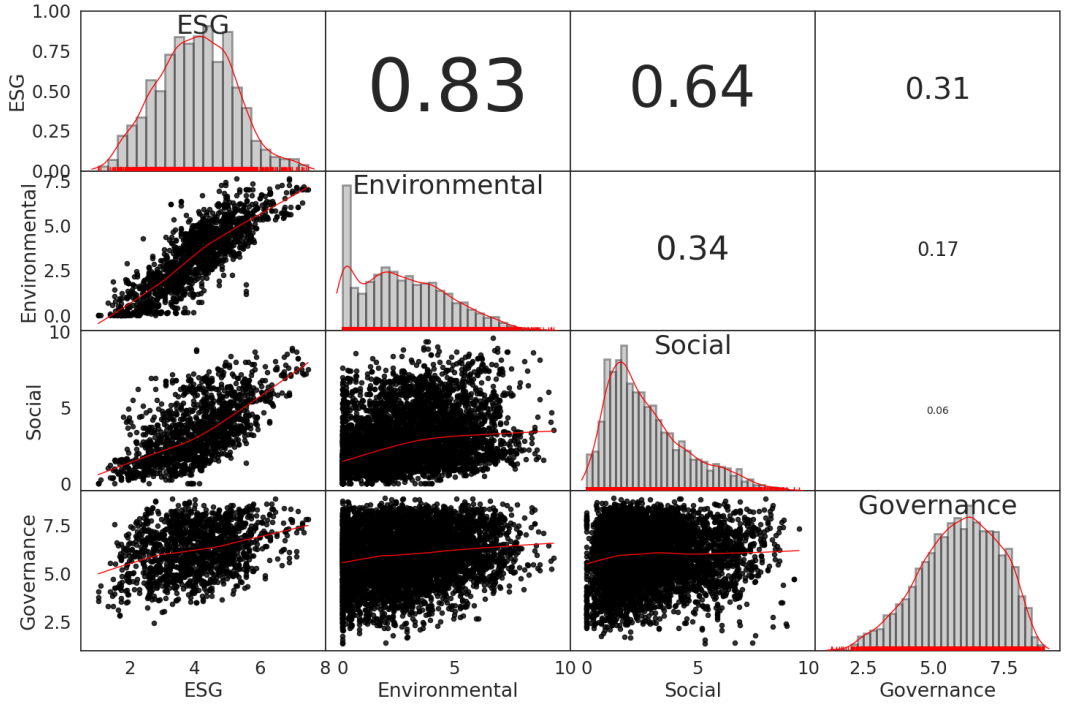


Figure 2: Intra-correlation between Environmental, Social, Governance and ESG score as provided by Refinitiv for a sample of 2445 European compananies

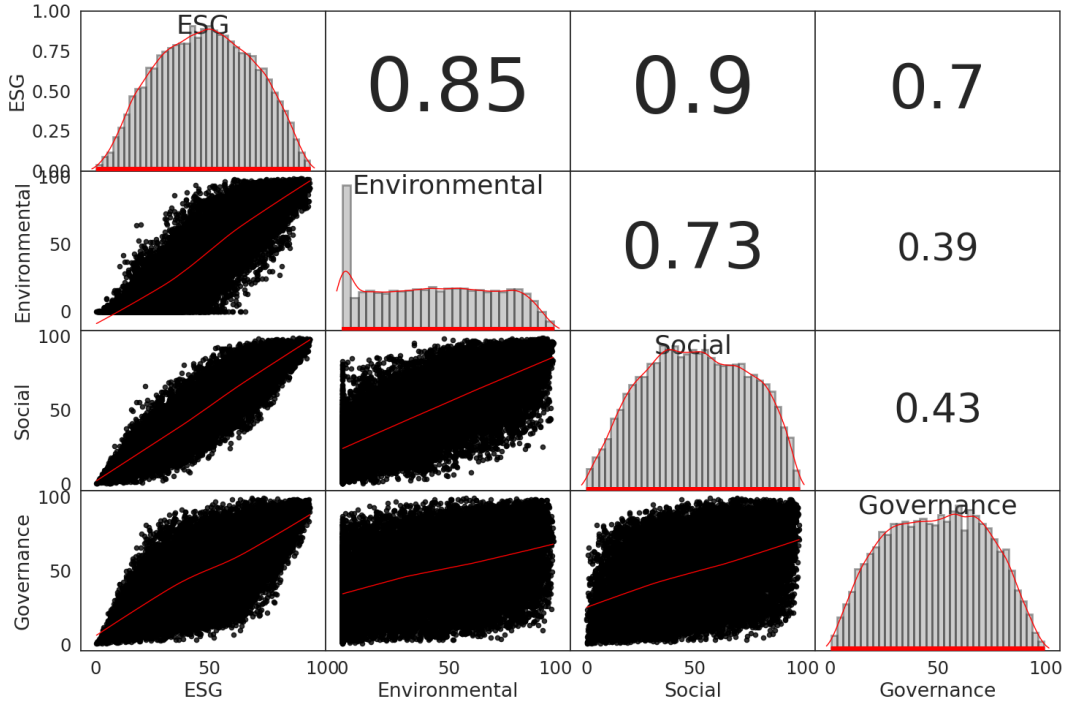


Figure 3: Intra-correlation between Environmental, Social, Governance and ESG score as provided by SP (ex RobecoSAM) for a sample of 1411 European compananies

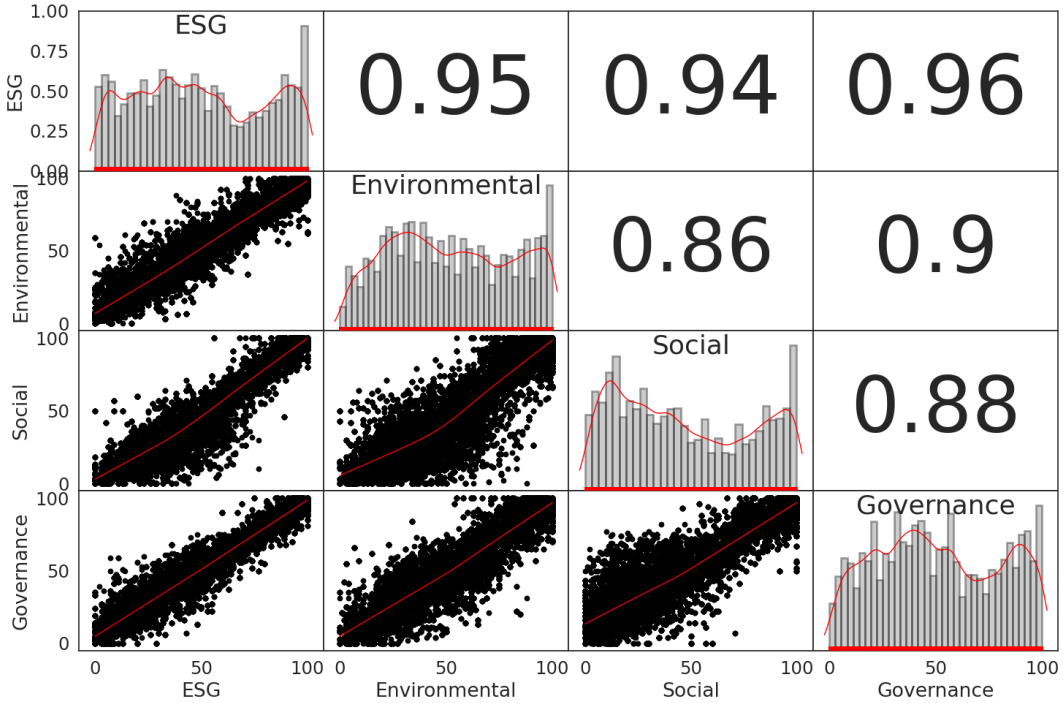


Figure 4: Intra-correlation between Environmental, Social, Governance and ESG score as provided by Sustainalytic for a sample of 647 European compananies. The scores have been collected before the methodology change

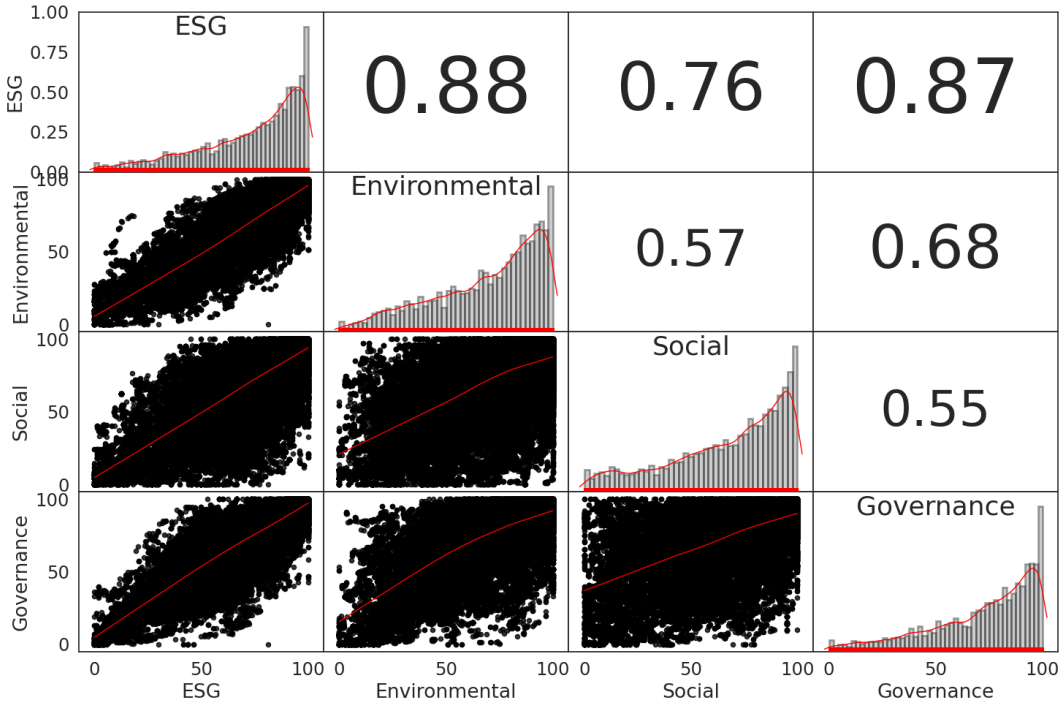
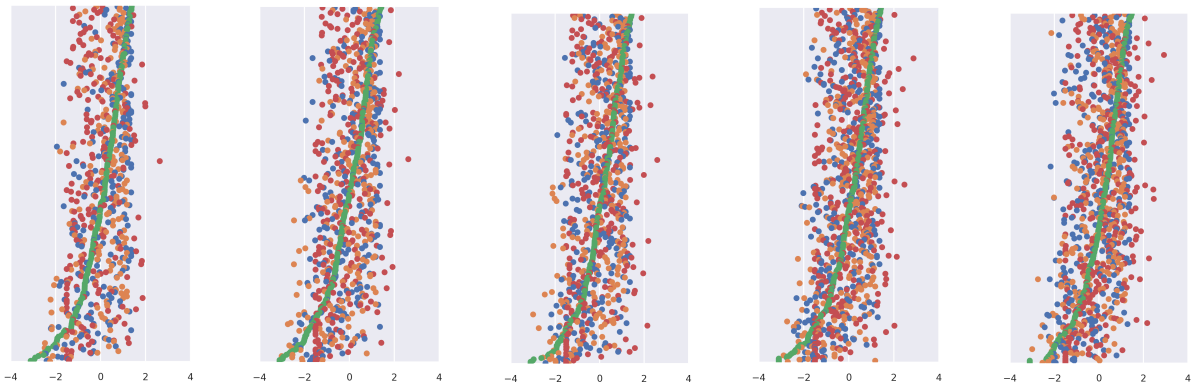
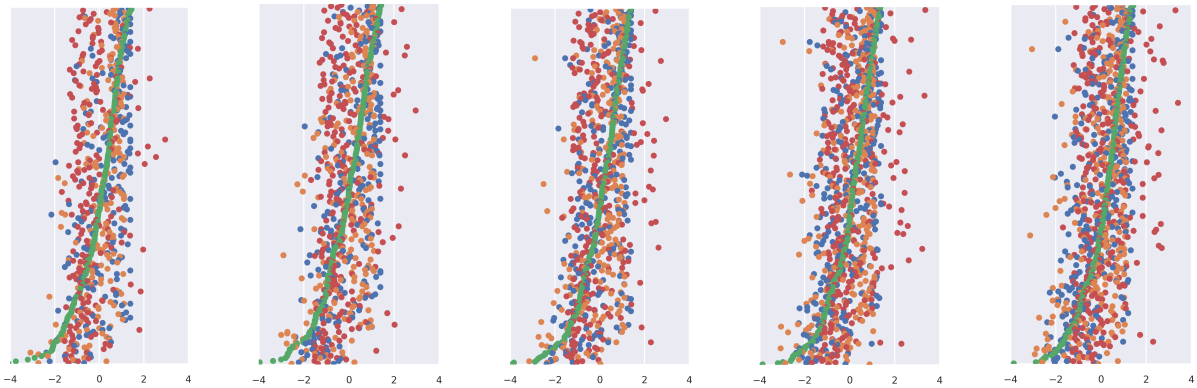


Figure 5: Environmental Rating Disagreement between RobecoSAM (blue), Sustainalytics (orange), Refinitiv (green), and Bloomberg (red). All ratings have been standardized and sorted using Refinitiv's scores as reference.



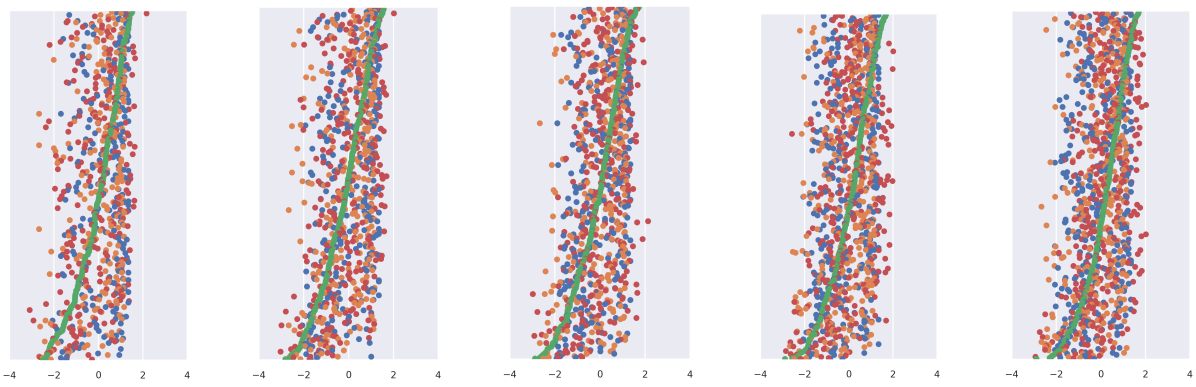
(a) 2016 **(b)** 2017 **(c)** 2018 **(d)** 2019 **(e)** 2020

Figure 6: Social Rating Disagreement between RobecoSAM (blue), Sustainalytics (orange), Refinitiv (green), and Bloomberg (red). All ratings have been standardized and sorted using Refinitiv's scores as reference.



(a) 2016 **(b)** 2017 **(c)** 2018 **(d)** 2019 **(e)** 2020

Figure 7: Governance Rating Disagreement between RobecoSAM (blue), Sustainalytics (orange), Refinitiv (green), and Bloomberg (red). All ratings have been standardized and sorted using Refinitiv's scores as reference.



(a) 2016 **(b)** 2017 **(c)** 2018 **(d)** 2019 **(e)** 2020

Figure 8: Average standard deviation of Environmental (green), Social (blue), and Governance (yellow) ratings divided per year. The average standard deviation is calculated on a sample of 394 European companies. Each year we take the average of the standard deviations computed using the rating provided by the four agencies of all the companies in the sample.

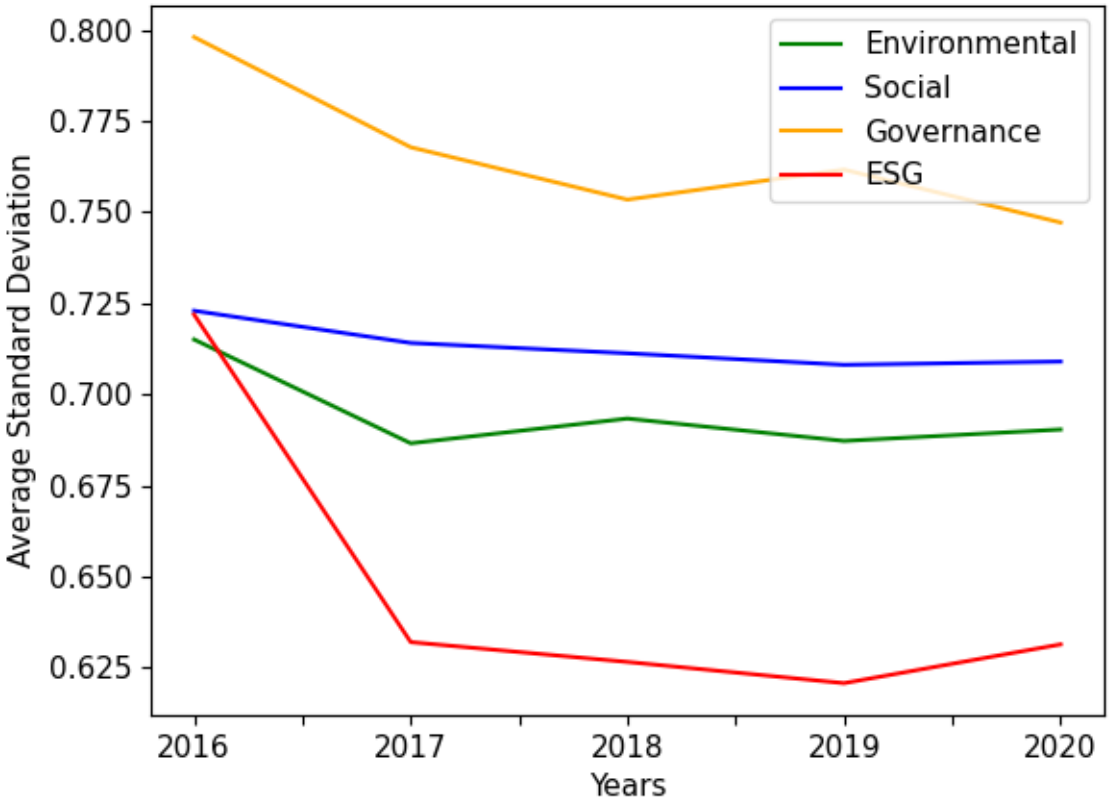
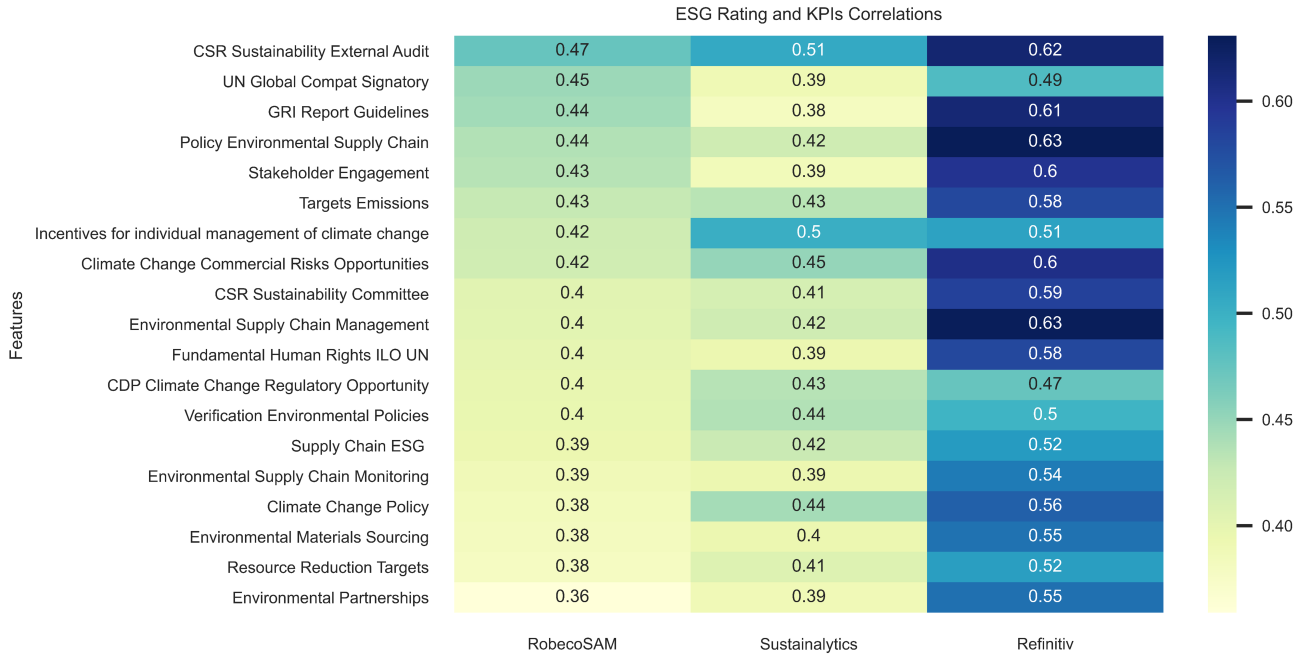


Figure 9


ESG Rating and KPIs Correlations
Features
CSR Sustainability External Audit 0.47 0.51 0.62
UN Global Compat Signatory 0.45 0.39 0.49
GRI Report Guidelines 0.44 0.38 0.61
Policy Environmental Supply Chain 0.44 0.42 0.63
Stakeholder Engagement 0.43 0.39 0.6
Targets Emissions 0.43 0.43 0.58
Incentives for individual management of climate change 0.42 0.5 0.51
Climate Change Commercial Risks Opportunities 0.42 0.45 0.6
CSR Sustainability Committee 0.4 0.41 0.59
Environmental Supply Chain Management 0.4 0.42 0.63
Fundamental Human Rights ILO UN 0.4 0.39 0.58
CDP Climate Change Regulatory Opportunity 0.4 0.43 0.47
Verification Environmental Policies 0.4 0.44 0.5
Supply Chain ESG 0.39 0.42 0.52
Environmental Supply Chain Monitoring 0.39 0.39 0.54
Climate Change Policy 0.38 0.44 0.56
Environmental Materials Sourcing 0.38 0.4 0.55
Resource Reduction Targets 0.38 0.41 0.52
Environmental Partnerships 0.36 0.39 0.55
RobecoSAM
Sustainalytics
Refinitiv
0.60
0.55
0.50
0.45
0.40