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# MULTIDIMENSIONAL DISAGREEMENT OF THE CREDIT RATINGS AND ESG SCORINGS GRANTED TO EUROPEAN BANKS. ARE CREDIT RATINGS RELATED TO ESG SCORINGS?

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ABSTRACT: The study covers 53 largest European banks and the largest banks from CEE countries. Credit ratings from 3 leading rating agencies and 8 ESG scoring providers are considered. The similarity is measured by cosine distance and Spearman rank correlation. The analysis shows a high similarity between the credit ratings with S&P's ratings being relatively more conservative. A much more significant divergence characterises the pairwise comparison of ESG scores. As the C/I ratio increases, the similarity of credit ratings increases, and sovereign banks have the relatively highest correlation of credit risk ratings. The most substantial divergence is recorded for UK banks, and the greater the value of a bank's own funds, the more visible the divergence of ratings given by Big Three providers. In the case of ESG scoring, none of the sample distribution criteria allowed for the determination of the relationship between ESG scorings. Indeed, unlike credit ratings, ESG scores are weakly correlated with each other.

KEYWORDS: ESG scoring, credit rating, credit risk, ESG risk, disagreement

### Introduction

A credit rating is an opinion, expressed in the form of an alphanumeric notation, on credit risk issued by a credit rating agency (Korzeb et al., 2021). The opinion relates to a specific business entity or debt issuance. A credit rating is a tool for risk assessment and monitoring, but is also used in developing credit and investment policy criteria. The credit rating market is dominated by the Big Three (S&P, Moody's and Fitch Ratings), which together account for more than 90% of the market share (Reuters, 2023).

ESG scoring, on the other hand, is a way of assigning a quantitative indicator (usually a specific number or letter) to the environmental, social, and governance (ESG) activities undertaken by a particular business entity. According to the European Commission's Draft Regulation on Transparency and Integrity of Environmental, Social and Governance (ESG) Rating Activities, ESG scoring should be understood as an opinion, a score, or a combination of both that relates to an entity, a financial instrument, a financial product, an ESG profile or ESG characteristics of a company and its exposure to ESG risks (European Commission, 2023). ESG scorings most often reflect the level of ESG risk and/or the quality of ESG risk management. They are awarded by specialised entities. These are either credit rating agencies (CRAs), companies controlled by CRAs, or entities not owned by CRAs (including stock index owners). The market for ESG scoring providers is significantly fragmented, and the methodologies used by these entities vary significantly. ESG scorings are increasingly vital in banks' credit and investment policies or risk management (Gyönyörová et al., 2021). ESG scoring is also a tool for building a diversified loan or investment portfolio with a profile in line with sustainability objectives. ESG scoring acts as a criterion, determining the credit spread for green or sustainable financial products (Korzeb & Niedziółka, 2023). Despite recognising CRAs as institutions complicit in the global financial crisis, the role of credit ratings is not diminishing and ESG scorings are becoming increasingly important. Indeed, it appears that, among a survey of 500 global institutional investors from Europe, North America, and the Asia Pacific region with assets under management worth US\$ 3.5 trillion, ESG risk is considered a principal factor by 93% of institutions, and for 17% sustainability is a critical factor (Hannay, 2023).

For these reasons, a key question arises about the confidence in these ratings and scorings. Their reliability begins to be questioned when there are discrepancies between ratings or scorings given by different agencies to the same entity. In this paper we define these discrepancies of performance assessments from different ESG scoring providers as disagreement (Naffa & Dudás, 2023). While correlations between credit ratings provided by various rating agencies are usually positive and high, the diversity of methodologies and the focus on different ESG risk issues (level of risk versus quality of risk management) means that individual entities sometimes have divergent ESG scorings. Due to a fairly widespread awareness of methodological differences in the process of assigning ESG scores by individual providers, the phenomenon characteristic of credit ratings (especially before the subprime crisis), known as rating shopping, does not occur in this market. This is borne out by the fact that large banks publish ratings from more than a dozen agencies specialising in ESG assessments. The disagreement has several significant consequences. First, it makes it difficult to evaluate the ESG performance of companies, funds, and portfolios, which is the primary purpose of ESG assessment (Kim & Koo, 2023). Second, the divergence of opinions on ESG scores is not conducive to the correct valuation of ESG risks, although - on the other hand - the divergence in ESG scorings lowers the reliance rating and prompts investors and lenders to analyse ESG risks themselves (Anselmi & Petrella, 2022).

The disagreement emphasises the importance of considering several scorings when assessing ESG performance (Bissoondoyal-Bheenick et al., 2023). Third, ESG scoring divergence decreases companies' incentives to improve their ESG performance. Companies receive mixed signals from rating agencies about which actions are expected and will be valued by the market. Fourth, the divergence of ESG scores introduces uncertainty into any decision based on ESG scorings and, therefore, represents a challenge for a wide range of decision-makers (Berg et al., 2022).

The importance of discrepancies between credit ratings of a given type (across providers) and between credit ratings and ESG scorings assigned to a given company is a highly topical and critical issue. It is particularly true for banks, on which achieving the Sustainable Development Goals depends largely (Bernardelli et al., 2022). For this reason, this article aims to answer the question to what extent credit ratings are correlated and to what extent the credit risk reflected in a credit rating is linked to ESG risk, measured by ESG scoring.

The study covers 53 largest European banks in terms of assets, including all those on the European Banking Authority's (EBA) list of Global Systemically Important Institutions (G-SII) and additionally the largest banks (also in terms of assets) from Central and Eastern European countries. Credit ratings from 3 leading rating agencies (S&P, Moody's and Fitch Ratings; the so-called Big Three) and 8 ESG scoring providers (Sustainalytics (Morningstar), FTSE\$Good, ISS (ESG Corporate Rating), MSCI (ESG Corporate Rating), S&P Global Ratings ESG Evaluation, Standard & Poor's CSA, Moody's ESG Solutions (ESG Profile), and CDP (Carbon Disclosure Project)) are considered.

To determine discrepancies, ratings and scores are compared with each other in pairs using two measures of similarity, i.e., cosine distance and Spearman rank correlation. The results indicate a relatively high convergence of credit ratings and a low correlation of ESG scores assigned by individual providers. The novelty of our study manifests itself in the sample selection (disagreement has not been studied before in relation to a group of major European banks) and the period of the study. Additionally, the research method used in which disagreement is investigated using two alternative approaches, as well as the originality of findings all contribute to the value of this paper. From these, the conclusion that – while there is minor variation in the credit ratings given to individual banks – one of the Big Three agencies (S&P) is more conservative than the other two, comes to the fore. In addition, the ESG scoring of the rated banks generated by the different providers is characterised by a low degree of correlation, and the inter-differences between ESG scorings are significantly higher than is the case for credit ratings, as evidenced by the results of the analysis using cosine distance.

The rest of the paper is organised as follows: in the second section, we review relevant literature and develop hypotheses. Section 3 describes the methodology and data. Section 4 reports and discusses our empirical results, while Section 5 covers the conclusion and a number of regulatory implications.

### Literature review and hypothesis development

An essential level of similarity usually characterises the credit ratings that the leading CRAs assign. It is confirmed by the results of studies by Chodnicka-Jaworska (2017) and Caridad et al. (2020), among others. However, the high level of correlation is due – among other things – to the fact that, with full comparability of ratings (a given rating on the scale of one provider corresponds to the rating of another provider), users of ratings associate a given rating with a specific level of probability of default (PD). Additionally, thanks to the relatively high transparency of rating methodologies, they can verify the correctness of the rating assigned by a given CRA. This market control is an essential and influential mechanism for disciplining CRAs, at least in the case of single-name ratings. At the same time, Nguyen et al. (2023) show that all leading CRAs replicate a pattern in which their response time depends on the political similarities between the CRA and the bond issuer. Given these findings in the literature, we conjecture that:

H1: The credit ratings assigned to the largest banks in Europe as well as the largest banks from Central and Eastern Europe by Big Three rating agencies are characterised by a high degree of similarity.

Despite the growing importance of ESG practices in business and society, stakeholders have not yet reached a consensus on how to define and measure ESG performance. In fact, a wide variety of stakeholders (e.g., academics, companies, investors, non-profit organisations, rating agencies, and policymakers) have developed different approaches to the concept and have developed their own methodologies to capture it (Antolín-López & Ortiz-De-Mandojana, 2023). As a result of these discrepancies between the taxonomy, data sources, and methodologies, ESG scores become less precise and comparability between the ESG performances of different companies becomes challenging (Ozkan et al., 2023).

Although there are several ways to assess corporate performance, such as rankings, ESG audits, online platforms for evaluating performance, text mining analysis, ESG questionnaires and surveys, the preferred tool is a rating or scoring granted by specialised rating agencies (Zhang et al., 2024; Wang et al., 2023; Amel-Zadeh & Serafeim, 2021; Halbritter & Dorfleitner, 2015; Windolph, 2011).

According to the European Commission's Draft Regulation on Transparency and Integrity of Environmental, Social and Governance (ESG) Rating Activities, an ESG scoring should be understood as an opinion, a score, or a combination of both that relates to an entity, a financial instrument, a financial product, an ESG profile or ESG characteristics of a company and the company's exposure to ESG risks (Europea Commission, 2023). From the outset, ESG scorings have been heavily criticised by both the companies, investors and the research community. Doyle (2018) points to the following problems:

The example of a bulleted list:

- Disclosure Limitations and Lack of Standardisation: There are no standardised rules for Environmental and Social disclosures, nor is there a disclosure auditing process to verify reported data; instead, agencies must apply assumptions, only adding to the subjective nature of ESG scorings.
- Company Size Bias: Companies with higher market capitalisation tend to be awarded ratings in the ESG space that are meaningfully better than lower market-cap peers, such as mid-sized and small businesses.
- Geographic Bias: Regulatory reporting requirements vary widely by region and jurisdiction. Two
  companies active in the same industry, doing the same general thing, are often assigned different
  scores based on where they are headquartered. Companies domiciled in Europe, in particular,
  frequently receive much higher ESG scorings.
- Industry Sector Bias: Company-specific risks and differences in business models are not accurately captured in composite ratings. Because of significant differences in business models and risk exposure, companies in the same industry are unfairly evaluated under the same model.
- Inconsistencies Between Rating Agencies: Individual company ratings are not comparable across
  agencies due to a lack of uniformity of rating scales, criteria, and objectives.
- Failure to Identify Risk: One of the purposes of ESG scorings is to evaluate risk and identify misconduct. ESG scores do not adequately function as warning signs for investors in companies that experience serious mismanagement issues.

Another issue is sourcing data to produce ESG performance or risk assessments and indicators. As Antolín-López and Ortiz-De-Mandojana (2023) note: "rating agencies differ in the origin of the data used to create their ESG scorings and metrics. The main difference is whether the rating agency considers only public information (available to all stakeholders), or whether it involves the company itself in information gathering to create the ratings/metrics". It may result in information collected from the companies themselves in the form of questionnaires not adequately reflecting their actual performance (Das, 2023; Risso & Longarini, 2023). Indeed, greenwashing, a tactic used by various companies, organisations, and institutions to present their products, activities, or strategies as environmentally beneficial, is becoming increasingly common. However, in such cases, actions often fail to follow declarations, exposing such communication as aiming to mislead stakeholders. In addition, Ozkan et al. (2023) highlight that ESG providers obtain all the necessary data from the companies they are supposed to rate. It leads to an apparent conflict of interest. Each scoring provider has thus developed its own customary assessment methodology for differentiation purposes, leading to regular divergences among agencies (Billio et al., 2021). Escrig-Olmedo et al. (2019) suggest that, even if two agencies would integrate the same set of criteria and metrics into their respective rating process, they could still deliver different scores for the same company. This is due to the final stage of the ESG performance assessment evaluation model, namely the weighting stage. In fact, the divergence between metrics and scorings has already been highlighted in the literature (i.e., Berg et al., 2022; Christensen et al., 2022; Chatterji et al., 2016). Berg et al. (2022) identify three distinct sources of divergence. "Scope divergence" refers to the situation where scores are based on different attributes. One scoring provider may include lobbying activities, while another might not, causing the two ratings to diverge. "Measurement divergence" is when ESG scoring companies measure the same attribute using different indicators. For example, a firm's labour practices could be evaluated based on workforce turnover, or the number of labour-related court cases taken against the firm. Finally, "weight divergence" emerges when scoring providers take different views on the relative importance of attributes. For example, the labour practices indicator may enter the final scoring with greater weight than the lobbying indicator. The contributions of scope, measurement, and weight divergence are intertwined, making it difficult to interpret the difference between two ESG scores. They also add that measurement divergence is partly driven by a "rater effect." It is also known as the "halo effect," meaning that a firm receiving a high score in one category is more likely to receive high scores in all the other categories from that same rater. Using this taxonomy, they decompose the divergence into scope, measurement, and weight contributions. Measurement contributes 56% of the divergence, scope 38%, and weight 6%.

Given the diversity of methodologies, data sources and the focus on assessing various aspects of ESG, we expect:

H2: The ESG scoring awarded by the two providers has a relatively low level of similarity.

The logical connection between H1 and H2, as well as the fact that ESG risk is not the only determinant of credit risk and the results of research on this relationship are not conclusive, allow us to formulate a further hypothesis:

H3: Credit ratings are weakly linked to ESG scores.

### Data and methodology

### Data

The research sample comprises 53 largest European banks in terms of assets, including all those on the European Banking Authority's (EBA) list of Global Systemically Important Institutions (G-SIIs) and, additionally, the largest banks in terms of assets from Central and Eastern European countries (Table 1).

Country	Number of banks	Country	Number of banks
Austria	2	Netherlands	3
Belgium	2	Norway	1
Czech Republic	2	Poland	10
Denmark	2	Romania	1
Estonia	2	Russia	2
Finland	2	Slovakia	3
France	6	Slovenia	2
Germany	7	Spain	5
Finland	2	Sweden	3
Hungary	2	Switzerland	5
Ireland	2	United Kingdom	6
Italy	5		

Table 1. Summary of residence country of analysed banks

The study used the credit ratings assigned to banks by the three leading rating agencies (S&P, Moody's and Fitch) forming the so-called Big Three and the ESG scoring assigned by the eight providers to the banks analysed.

#### Methodology

There are many measures of similarity and dissimilarity. Their selection is determined primarily by the type of data. Different scales and forms (numeric and categorical) are used for credit ratings and ESG scorings. It is necessary to develop an appropriate procedure to enable comparability, with certain assumptions about the linearity of the ratings and scorings analysed. A description of the procedure used in the study is presented in the following section.

As a first step, a conversion to numerical equivalents is applied for each credit rating and ESG previously expressed in categorical form (e.g. letters). In doing so, the categories are assumed to be distributed on a linear scale at equidistant intervals. In the second step, a min-max normalisation is

performed for each credit rating and ESG score. The smallest and largest values recorded for a given dataset are taken as the minimum and maximum, respectively, rather than the potential smallest and largest values allowed by the rating or scoring provider. This method of normalisation ensures that ratings and scorings are comparable with each other.

The key stage of the analysis is to compare each possible pair of ratings and scorings. Two measures are used for this:

Cosine distance, in which similarity is represented by the angle between two vectors representing the characteristics of the objects being compared. The closer to 1 (collinear vectors), the more similar the objects are, while 0 (perpendicular vectors) indicates no similarity. It is a frequently used measure when comparing texts.

Spearman's rank correlation which provides an opportunity to examine relationships without assumptions about the distributions of the variables under study. This non-parametric measure is robust to outliers and takes values in the range [-1; 1]. The interpretation of Spearman's correlation is similar to Pearson's linear correlation coefficient, but has a broader range of applications.

Using the two measures mentioned above, the similarity (or dissimilarity) of ratings and scorings is verified, and the possible differentiation of the accepted values in relation to groups of banks defined based on their characteristics.

# Results and discussion

Reliable ratings and scorings should give similar indications if similar factors are assessed. Based on basic descriptive statistics, such as mean, median and standard deviation, there are significant differences in individual rating and scoring distributions. For example, the mean ESG scores range from 0.59 to 0.70 and the median from 0.57 to as high as 0.75 (Table 2).

Rating	mean	median	sd
Sustainalytics	0.67	0.67	0.16
FTSE\$Good	0.70	0.67	0.25
ISS	0.65	0.60	0.16
MSCI	0.67	0.60	0.20
S&P Global Ratings ESG Evaluation	0.59	0.57	0.23
Standard&Poor's CSA	0.59	0.68	0.28
Moody's ESG Solutions	0.63	0.67	0.22
CDP	0.61	0.75	0.35
S&P	0.49	0.50	0.20
Moody's	0.59	0.60	0.19
Fitch	0.59	0.64	0.18

Table 2. Descriptive statistics on credit ratings and ESG scores

Credit ratings exhibit the characteristics of different rating dispersion, as highlighted by the histograms below (Figures 1-3).



Figure 1. Dispersion of credit ratings assigned to banks by S&P



Figure 2. Dispersion of credit ratings assigned to banks by Moody's



Figure 3. Dispersion of credit ratings assigned to banks by Fitch

It is unreasonable to draw conclusions from histograms or descriptive statistics alone, as not every bank was assessed yearly. Theoretically, therefore, differences in distributions may be determined by sampling. Hence, a better approach is to quantify similarities using commonly recognised measures. One of these is the cosine distance. The values of this measure for all credit ratings and ESG scores considered are included in Table 3. The medians of the values in the individual ratings are not significantly different from the arithmetic means, and the standard deviations do not indicate the presence of many outliers. Hence, for most ratings, the rating distributions are relatively well clustered around the mean or are multi-modal in nature. Therefore, the cosine distances indicate a reasonably high similarity (the smallest value is 0.86), while – at the same time – the cross-similarity between credit ratings is higher (the minimum calculated cosine distance is as high as 0.97) than is the case for pairs of ESG scores or pairs composed of a credit rating and an ESG score.

# Table 3. Cosine distance for pairs of credit ratings and ESG scores

Specification	Sustainalytics	FTSE\$Good	ISS	MSCI	S&P Global Ratings ESG. Evaluation	Standard&Poor's CSA	Moody's ESG. Solutions	CDP	S&P	Moody's	Fitch
Sustainalytics	1.00	0.93	0.97	0.96	0.93	0.86	0.95	0.91	0.92	0.94	0.94
FTSE\$Good	0.93	1.00	0.95	0.94	0.98	0.89	0.94	0.97	0.94	0.93	0.96
ISS	0.97	0.95	1.00	0.95	0.95	0.87	0.96	0.91	0.95	0.96	0.97
MSCI	0.96	0.94	0.95	1.00	0.95	0.88	0.92	0.90	0.92	0.93	0.95
S&P Global Ratings ESG Evaluation	0.93	0.98	0.95	0.95	1.00	0.92	0.90	0.89	0.92	0.93	0.94
Standard&Poor's CSA	0.86	0.89	0.87	0.88	0.92	1.00	0.96	0.91	0.92	0.87	0.91
Moody's ESG Solutions	0.95	0.94	0.96	0.92	0.90	0.96	1.00	0.90	0.97	0.94	0.95
CDP	0.91	0.97	0.91	0.90	0.89	0.91	0.90	1.00	0.89	0.88	0.90
S&P	0.92	0.94	0.95	0.92	0.92	0.92	0.97	0.89	1.00	0.97	0.98
Moody's	0.94	0.93	0.96	0.93	0.93	0.87	0.94	0.88	0.97	1.00	0.99
Fitch	0.94	0.96	0.97	0.95	0.94	0.91	0.95	0.90	0.98	0.99	1.00

# Table 4. Spearman rank correlation for pairs of credit ratings and ESG scores

Specification	Sustainalytics	FTSE\$Good	SSI	MSCI	S&P Global Ratings ESG Evaluation	Standard&Poor's CSA	Moody's ESG Solutions	CDP	S&P	Moodys	Fitch
Sustainalytics	1.00	0.22	0.25	0.27	0.17	0.09	0.27	0.33	-0.06	-0.03	-0.09
FTSE\$Good	0.22	1.00	-0.01	0.38	0.54	0.04	0.53	0.32	0.29	0.25	0.33
ISS	0.25	-0.01	1.00	0.11	-0.04	0.21	0.53	0.23	-0.04	0.17	0.10
MSCI	0.27	0.38	0.11	1.00	0.30	0.04	0.27	0.19	0.18	0.22	0.24
S&P Global Ratings ESG Evaluation	0.17	0.54	-0.04	0.30	1.00	0.80	0.31	0.24	0.14	0.21	0.27
Standard&Poor's CSA	0.09	0.04	0.21	0.04	0.80	1.00	0.61	0.13	0.44	0.12	0.56
Moody's ESG Solutions	0.27	0.53	0.53	0.27	0.31	0.61	1.00	0.37	0.42	0.28	0.22
CDP	0.33	0.32	0.23	0.19	0.24	0.13	0.37	1.00	-0.25	0.06	0.16
S&P	-0.06	0.29	-0.04	0.18	0.14	0.44	0.42	-0.25	1.00	0.63	0.67
Moody's	-0.03	0.25	0.17	0.22	0.21	0.12	0.28	0.06	0.63	1.00	0.82
Fitch	-0.09	0.33	0.10	0.24	0.27	0.56	0.22	0.16	0.67	0.82	1.00

To better quantify the similarity, comparisons are made using the second measure, the Spearman correlation coefficient. Indeed, if credit ratings and ESG scorings are meaningful, they should position banks similarly. The Spearman correlation does not consider nominal scores, only their relative positioning. Hence, it seems to reflect better the correspondence of ratings and scoring. Table 4 summarises all pairs of credit ratings and ESG scores and the Spearman correlation coefficients determined. The values are far from 1, indicating a markedly different positioning of banks in the various ratings. Relatively high coefficient values (between 0.63 and 0.82) are recorded for credit ratings. For ESG scoring, the coefficient values range from -0.04 to 0.80.

To verify whether deviations from consistency in ratings or scorings are systematic, comparisons of correlation coefficients by bank group are made. For the sake of representativeness, only groups with a size of at least ten are restricted. Regarding credit ratings, Moody's and Fitch are clearly more similar, while S&P deviates slightly in terms of its ratings. Some regularities can be observed in the breakdown according to the bank's operating efficiency criterion (Table 5), measured by the Cost-To-Income Ratio (C/I). The choice of cost efficiency is due to the impact of this ratio on the analysed institution's profitability and default risk, and these are taken into account in credit rating methodologies. By dividing the set into quartiles, Spearman correlation coefficients are calculated in each of the sub-quartiles, i.e. [MIN; Q1), [Q1; Q2), [Q2; Q3), [Q3; MAX].

Rating A	Rating B	[MIN; Q1)	[Q1; Q2)	[Q2; Q3)	[Q3; MAX]
S&P	Moody's	0.77	0.73	0.65	-0.11
S&P	Fitch	0.85	0.67	0.63	0.01
Moody's	Fitch	0.83	0.80	0.83	0.88

Table 5. Spearman rank correlation of credit ratings in relation to bank operational efficiency

While the pairwise correlation of Moody's and Fitch credit ratings in each sub-band is similar, pairs involving S&P ratings show monotonically decreasing Spearman correlation coefficients as the C/I value increases.

Inconsistencies in the indications can also be seen by dividing banks into groups relative to the logarithm of shareholder funds (Table 6). Bank capital determines the resilience of an institution to a crisis and is also an essential determinant of loan dynamics. As with the operating efficiency criterion, the credit ratings assigned by Moody's and Fitch show a reasonably stable, high and monotonically increasing correlation, while the other pairs show instability and volatility. For medium-sized banks, the correlation between S&P and Fitch credit ratings is characterised by a value close to the maximum.

Table 6. Spearman rank correlation of credit ratings as a function of a bank's ln (shareholders funds)

Rating A	Rating B	[MIN; Q1)	[Q1; Q2)	[Q2; Q3)	[Q3; MAX]
S&P	Moody's	-	0.68	0.77	0.43
S&P	Fitch	-	0.99	0.68	0.41
Moody's	Fitch	0.71	0.70	0.75	0.89

A decomposition of the sample based on the bank type criterion leads to the conclusion that credit ratings assigned to state-controlled banks have an extremely high correlation, with Moody's and Fitch ratings having the highest similarity (Table 7).

Table 7. Spearman rank correlation of credit ratings by bank type

Rating A	Rating B	Private	Cooperative	State	Public law institutions
S&P	Moody's	0.53	0.60	0.97	_
S&P	Fitch	0.61	0.19	0.88	-
Moody's	Fitch	0.87	0.50	0.88	0.83

It is also possible to divide banks according to the criterion of the country of the main shareholder (Table 8). For Sweden, Italy and Switzerland, all credit ratings are remarkably similar, while the most considerable discrepancies are for UK banks. The British case can be explained by the global exposure of banks from that country and these institutions' rather complex business models.

Rating A	Rating B	United Kingdom	France	Spain	Germany	Italy	Switzerland	Netherlands	Denmark	Belgium	Sweden
S&P	Moody's	-0.28	-0.07	0.93	-	0.67	0.93	0.29	-	-	0.94
S&P	Fitch	-0.64	0.05	-0.03	-	-	0.75	0.87	-	-	0.89
Moody's	Fitch	0.45	0.67	-0.31	0.75	0.77	0.78	0.30	0.15	0.30	0.93

Table 8. Spearman rank correlation of credit ratings by country of origin of the bank

An analogous correlation analysis of ESG scoring by sample distribution based on selected criteria (Tables 9 – 11) shows relatively weak correlations between the scores. In the case of selected pairs of scorings, an even monotonicity in the strength of the correlations is discernible. It is especially true for the decomposition shown in Table 9, where banks are divided according to the logarithm of shareholders funds. At the same time, the ESG scorings assigned by different providers to state-controlled banks show relatively high correlation values. The negative correlations are surprising, as this means that the perception of ESG risk or the quality of ESG risk management represented by the two scoring providers is significantly different.

Scoring A	Scoring B	[MIN; Q1)	[Q1; Q2)	[Q2; Q3)	[Q3; MAX]
MSCI	ISS	-	-0.24	-0.20	0.52
ISS	Moody's ESG Solutions	-	-	0.42	0.93
Sustainalytics	CDP	-	0.70	0.52	0.25
ISS	CDP	-	0.41	0.29	0.08
Sustainalytics	ISS	-	0.07	0.31	0.33
Sustainalytics	MSCI	-	0.30	0.45	0.49

Table 9. Spearman rank correlation of ESG scoring by In shareholder funds

Table 10. Spearman rank correlation of ESG scores by type of bank

Scoring A	Scoring B	Private	Cooperative	State	Public law institutions
ISS	Moody's ESG Solutions	0.83	-0.29	-	-
Sustainalytics	FTSE\$Good	-0.27	-	0.85	-
FTSE\$Good	Moody's ESG Solutions	-0.07	-	0.92	-
FTSE\$Good	CDP	-0.06	-	0.89	-
MSCI	CDP	0.18	-0.20	0.47	-
MSCI	Moody's ESG Solutions	0.47	-0.17	-0.09	-
Sustainalytics	ISS	0.19	0.33	-	-0.30
Moody's ESG Solutions	CDP	0.16	-	0.73	-

Scoring A	Scoring B	Private	Cooperative	State	Public law institutions
Sustainalytics	CDP	0.21	-	0.78	-
Sustainalytics	Moody's ESG Solutions	0.19	0.27	0.75	-
ISS	CDP	0.24	0.69	-	-
ISS	MSCI	0.33	-0.09	-	0.27
Sustainalytics	MSCI	0.22	0.11	0.50	-

#### Table 11. Spearman rank correlation of ESG scores by bank country of origin

Scoring A	Scoring B	United Kingdom	France	Spain	Germany	Italy	Switzerland	Netherlands	Denmark	Sweden	Austria
MSCI	CDP	-0.21	-0.04	-0.01	0.03	0.69	0.70	0.07	0.93	-0.31	-0.40
Sustainalytics	MSCI	0.41	0.66	-0.51	-0.13	-	-	-	-	0.54	-
ISS	MSCI	0.47	0.54	-0.10	0.62	-	-	-	-	0.38	-0.47
ISS	CDP	-0.06	0.85	-	-	-	-	-	-	-	-
Sustainalytics	ISS	0.63	0.26	0.47	0.33	-	-	-	-	0.20	-
Sustainalytics	CDP	-0.05	-	-	-	-	-	-	-	-0.08	-

Due to the Return on Equity (ROE) structure of the surveyed banks (relatively few extreme observations), the next decomposition consists of splitting the sample into banks with ROEs lower and at least equal to the median (Table 12). In this case, the ESG scorings of banks with ROEs lower than the median are more similar than for institutions with relatively higher ROEs. This can be explained by the close relationship between one of the pillars of ESG (governance) and the efficiency of capital management. Therefore, providers of ESG scorings similarly and negatively assess low equity management efficiency.

Scoring A	Scoring B	< MEDIAN	>= MEDIAN
Sustainalytics	Standard&Poor's CSA.	0.28	-0.25
Sustainalytics	Moody's ESG Solutions	0.53	0.04
Sustainalytics	FTSE\$Good	0.42	0.00
Sustainalytics	ISS	0.54	0.16
FTSE\$Good	ISS	0.24	-0.13
ISS	MSCI	0.21	-0.02

Table 12. Spearman rank correlation of ESG scorings in relation to ROE

Our research indicates that, apart from the study conducted by Chodnicka-Jaworska (2017), there are no studies aimed at assessing the similarity of external credit ratings assigned to banks. The aforementioned paper points to a high convergence of credit ratings assigned by leading CRAs. It allows for a positive verification of H1. At the same time, the relatively significant difference between the correlations of Moody's – Fitch rating pairs and the pairs involving the ratings assigned by S&P is quite surprising. This result corresponds to the earlier observation that S&P ratings are characterised by a lower level, despite a dispersion similar to that found in the ratings assigned by the other agencies. The identification of S&P as the most conservative agency among the Big Three is important insofar as the study conducted by Chodnicka-Jaworska based on a sample of 643 banks from 24 European countries between 1998 and 2015 shows that relatively low ratings are assigned by Fitch. The

change found seems to confirm the thesis that the strategy of the smallest of the Big Three rating agencies (Fitch) aimed at increasing market share turns out to be a liberalisation of the approach used. The high similarity of the credit ratings assigned by the Big Three shown in this study confirms the findings of Chodnicka-Jaworska (2017). She also suggests that the largest CRAs attribute relatively higher ratings than small agencies.

Moreover, Bonsall et al. (2018) prove that ratings for widely covered firms are more accurate and convergent, although it should be noted that this study is based on a sample not assembled only from financial firms. The convergence of the Big Three concerning sovereign ratings is confirmed by Hmiden et al. (2024). An in-depth analysis of the similarity between credit ratings based on the division of the sample using the selected criteria reveals the monotonicity of the similarity scale of the ratings. It is particularly pronounced when the sample is divided into quartiles using the criterion of operating efficiency, bank type, and bank equity size. We also show variation in the convergence of ratings depending on the bank's country of origin. The approach indicated above has not previously been used in studies of bank convergence, and the promising results we obtain warrant further research.

In contrast to credit ratings, ESG scorings are characterised by a relatively low level of similarity. Only five pairs of ESG scoring have a Spearman rank correlation higher than 0.50, with a maximum correlation level of 0.80. The cases of negative correlation between the ratings given by different providers are surprising, as this means that according to one provider of ESG scoring, a specific bank has a low ESG risk and, according to another provider, a substantial risk. H2 can, therefore, be positively verified, and the results obtained correspond to the findings of the works by Berg et al. (2022), Christensen et al. (2022) and Chatterji et al. (2016) already cited in this article. The impact of ESG risk on bank credit (performance) risk is unclear, although the literature review conducted by Friede et al. (2015) leads to the conclusion that approx. 90% of studies prove a nonnegative ESG performance – corporate financial performance relationship. A positive correlation between ESG risk and bank performance is indicated by Meles et al. (2023), Capasso et al. (2020) and Drago et al. (2019), among others, while the opposite direction of the relationship or lack thereof for at least one pillar of ESG is found in the work of Bătae et al. (2021) and Ahmad et al. (2021). Our results, indicating a lack of commonality between credit risk and ESG risk assessments, lead to a positive verification of H3 and align with the second strand of research mentioned above. We explain the lack of similarities in ESG performance assessments and credit ratings by the broad spectrum of credit risk determinants (it is not only ESG risk, although its impact on credit risk is taken into account in the Big Three methodologies) and the still low level of knowledge of the scale of risks incurred by banks, which is due to the just-started process of reporting, identification and quantification. A separate but important problem is the relatively limited implementation of ESG risks in stress tests verifying a bank's resilience to the materialisation of different and interrelated risk factors.

# Conclusions

The analysis shows a high degree of similarity in the credit ratings assigned to the most prominent European banks, with the ratings formulated by S&P being relatively more conservative. Much greater divergence characterises the pairwise comparison of ESG scores assigned by different providers. It is due, on the one hand, to the diverse methodologies and interpretations of the scorings (ESG risk versus quality of ESG risk management) and, on the other hand, to the lack of a common denominator, which for credit ratings is the probability of default (PD). At the same time, a relatively weak relationship characterises ESG scorings and credit ratings assigned to individual institutions. It is all the more surprising as the literature tends to show a direct and indirect positive impact of ESG risks on credit risk (e.g. Höck et al., 2023; Bonacorsi et al., 2024), although one can also find conclusions that there is no such relationship or that involvement in ESG generates high costs that negatively affect financial performance (Kanno, 2023).

In-depth research aimed at answering whether splitting the sample changes the above conclusions indicates that the similarity of credit ratings increases as the C/I ratio goes up. Furthermore, state-controlled banks have the relatively highest correlation of credit risk ratings. The high correlation of credit ratings in the case of state-controlled banks is due to the homogeneity of the owner (in the case of private banks, the standing of bank owners varies) and the importance of the owner's standing in the rating methodology. Considering the bank's country of origin, the greatest divergence is recorded in the UK. The bigger the value of a bank's own funds, the larger the divergence of ratings given by Big Three entities. In the case of ESG scoring, none of the sample allocation criteria used make it possible to formulate a relationship between the scoring given by individual providers.

The results we obtained have important regulatory implications. Firstly, due to the convergence of credit ratings assigned by the Big Three, the rating requirement should include a rating from at least one of the Big Three agencies and one of the so-called small rating agencies. In the event of a significant divergence of opinion between these entities, this triggers an individual assessment process, reducing the widely criticised phenomenon of overdependence on external ratings (Malewska, 2021). Secondly, the large disagreement between ESG scores assigned by individual providers leads to the conclusion that lenders and investors should rely on several ESG assessments and separate analyses. These discrepancies call into question using ESG scores as a margin determinant in Sustainability-linked loans (bonds) products. Choosing the scoring provider that assigns the highest score poses a natural temptation. The multiplicity of ESG scoring providers used by leading European banks leads one to assume that bank authorities were guided by the expected audit outcome in selecting an ESG scoring provider. This problem could be alleviated by introducing regulations to implement the mandatory use of specific guidelines in methodologies for determining ESG performance assessments. Such a process has already started in the European Union. On the 13th of June 2023, the European Commission published a proposal for a Regulation on Environmental, Social and Governance (ESG) scorings. It aims to improve the transparency of ESG scoring characteristics and methodologies as well as harmonise these methodologies (van den Bogart, 2023). The final draft regulation was issued on the 5th of February 2024, addressing the lack of completeness, standardisation, methodological clarity, and integrity concerning ESG metrics and scores (Heinz et al., 2024). On the 24<sup>th</sup> of April 2024, the European Parliament finally adopted the regulation on the transparency and integrity of Environmental, Social and Governance (ESG) rating activities (ESGR). The ESGR introduces a common regulatory framework which shall improve the integrity, transparency and reliability of ESG ratings. This shall be feasible due to implementation of rules related to governance, independence, transparency, organisational and conduct requirements imposed on ESG ratings providers (Butler et al., 2024). Thirdly, the discrepancy between the level of credit risk and ESG risk for individual banks raises the call for a review of the methodologies used by CRAs setting credit ratings concerning the adequacy of taking into account the impact of the materialisation of ESG risks on credit risk.

This study is not without limitations. The first is the sample size, determined by the number of banks with ESG scorings. As the importance of ESG performance increases in the eyes of investors, regulators, and bank customers, we expect to see a dynamic increase in the number of institutions commissioning ESG scorings. Together with the anticipated harmonisation of methodologies for determining ESG scoring, this provides a rationale for future analysis. An interesting direction for future research would be to verify the relevance of variables determining the magnitude of discrepancies between ratings.

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#### The contribution of the authors

Conceptualization, M.B., Z.K. and P.N.; literature review, M.B., Z.K. and P.N.; methodology, M.B., Z.K. and P.N.; formal analysis, M.B., Z.K. and P.N.; writing, M.B., Z.K. and P.N.; conclusions and discussion, M.B., Z.K. and P.N.

The authors have read and agreed to the published version of the manuscript.

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# WIELOWYMIAROWA NIEZGODNOŚĆ RATINGÓW KREDYTOWYCH I OCEN ESG PRZYZNAWANYCH EUROPEJSKIM BANKOM. CZY RATINGI KREDYTOWE SĄ POWIĄZANE Z OCENAMI ESG?

STRESZCZENIE: Badanie obejmuje 53 największe banki europejskie oraz największe banki z Europy Środkowo-Wschodniej. Pod uwagę wzięto ratingi kredytowe nadawane przez 3 wiodące agencje ratingowe i 8 podmiotów nadających scoringi ESG. Zastosowano 2 miary podobieństwa, tj. odległość kosinusową oraz korelację rangową Spearmana. Przeprowadzona analiza wskazuje na duże podobieństwo ratingów kredytowych, przy czym oceny formułowane przez S&P odznaczają się stosunkowo większym konserwatyzmem. Dużo większe rozbieżności charakteryzuje porównanie parami scoringów ESG. Jednocześnie wraz ze wzrostem współczynnika C/I zwiększa się podobieństwo ratingów kredytowych, zaś stosunkowo największą korelacją ocen ryzyka kredytowego charakteryzują się banki państwowe. Największe rozbieżności notowane są w przypadku banków brytyjskich, a im większa wartość funduszy własnych banku, tym większa rozbieżność ratingów nadawanych przez podmioty z grupy Big Three. W przypadku scoringów ESG żadne z zastosowanych kryteriów podziału próby nie daje możliwości sformułowania zależności pomiędzy scoringami ESG. W przeciwieństwie bowiem do ratingów kredytowych scoringi ESG są między sobą słabo skorelowane.

SŁOWA KLUCZOWE: ESG scoring, credit rating, credit risk, ESG risk, disagreement